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Empowering Medical Students to Improve Their Mental Health

Fiona Moir

A thesis submitted in fulfilment of the requirements for the degree of Doctor of Philosophy in General Practice, The University of Auckland, 2013
Abstract

Aims:
Medical students have relatively high rates of depression and anxiety. Interventions to improve mental health and resistance to stress in this population are needed. This thesis includes three intervention studies and a systematic review that address this issue. The Computer Assisted Learning for the Mind (CALM) study aimed to develop and assess the use of a self-help web-based intervention to improve mental health amongst medical students. The Systematic Review aimed to assess the effectiveness of peer-led interventions to improve mental health in secondary and tertiary students. The Peer Intervention Pilot and Randomised Controlled Trial (RCT) aimed to assess the feasibility, acceptability and effectiveness of peer-support and peer-taught mindfulness interventions to improve mental health and wellbeing in medical students.

Methods:
The CALM study was a before-after intervention study that also assessed website utilization patterns. It identified the number and proportion of medical students in years 2 and 3 who accessed the web-based CALM site, and compared the characteristics of those who used the website with those who did not. Outcome measures included depression (PHQ-9) and anxiety (GADS-7), recorded at baseline, online during the 5-week website trial and at 12-week follow-up. Sub-sites visited were monitored and acceptability was assessed. The Peer Intervention Pilot developed and assessed three peer-led interventions versus control over 8 weeks. The Peer Intervention RCT was a 2-arm trial conducted over 6 months. Outcome measures included depression (PHQ-9), anxiety (GAD-7), quality of life (LASA), resilience (15 item resilience scale), academic self-concept (PCL) and motivation to learn (MSLQ).
Results:
The CALM website was accessed by 80/321 (25%). In comparison to the whole class, a higher percentage of those who visited the website had high PHQ-9 scores and GAD-7 scores (≥10). Those who accessed the website and could be linked by unique identifier (n=49) had significantly higher anxiety scores (p=0.01) but not higher depression scores (p=0.07) at baseline, than those who did not access the site (n=230). The Systematic Review found good evidence for the effectiveness of peer-led interventions for improving mental health amongst secondary students, and moderate evidence amongst tertiary students. The Peer Intervention Pilot showed that peer-led interventions were feasible and acceptable but the RCT was not able to show a significant improvement in outcomes compared with control.

Conclusions:
The level of evidence for peer-led interventions in students to improve mental health and wellbeing is promising but higher quality trials are needed. Peers are capable of delivering effective interventions and peer-led approaches are acceptable.
“These are much deeper waters than I had thought”

Sir Arthur Conan Doyle (1)
Acknowledgements

Thank you to my supervisors, Raina Elley and Marcus Henning for your wisdom and skills, enthusiasm, availability, patience and kindness. I have felt so lucky to have you advising and supporting me. Not once, did you let me down when I needed help, and I will be forever grateful. Thank you to my lovely husband Rob and my family, who have been with me every step of the way. Rob, this would not have been possible without your love and your belief in me. I know how many times you have had to put your own priorities to one side to let me work. To Ben, thank you for putting up with being without a Mum for days at a time and for reminding me of the importance of having a positive attitude. To Maddy and Harry, thank you for helping me whenever you can with my usual home jobs, and being there when I needed some help.

To my family in Scotland, Dad and Annette, Ken, Ali, Anna and Kirsten, thank you for helping with my first recruitment and randomisation meeting when you were meant to here on holiday, and for sending me inspiring gifts. A special thank you to my Mum for the suggestion of my dedication. I will always love you. To my family in England, Bill and Debs, Ella and Archie, thank you for putting me up on my trips and for my Barcelona champagne. To my family in New Zealand, thank you to June for letting me write at Tindalls, to Jenny and Heather for my Turangi retreat, and to Sarah and Alex for endless encouragement. I have felt you all cheering me onwards and it has made it easier.

Thank you to my peer leaders and to all of the medical students who participated in this research. It has been a privilege to work with you and to do this work together. Thank you to my friends and work partners, Ren, Sue and Richard for letting me make my PhD a priority, and for your warm friendship and enthusiasm. Thank you to Suzanne and Steve for being my school holiday saviours and for looking after me while I wrote.
Thank you to Bev at Piha for my peaceful cabin and my ‘brain’ smoothies, and Sue Crengle, thank you for your PhD wisdom provided at the gym.

Thank you to many people in The Department of General Practice and across the University. Thank you to Stephen Buetow, Ngaire Kerse and Felicity Goodyear-Smith for miscellaneous pieces of wisdom, thank you to Bruce Arroll for telling me to ‘decide what I wanted to be an expert in’, and to Peter Huggard and Val Grant for encouraging me to pursue my passion for this topic. Thank you to my fellow PhD students and work-mates, Karen Falloon, Ruth Teh and Theresa Riley – a special thank you Theresa for your calm help at the end. Thank you to Elizabeth Robinson, Simon Moyes and Avinesh Pillai for statistical wizardry, to Warwick Bagg and the Medical Programme Directorate for their interest in peer support, to Roger Booth for being a knight in shining armour on several occasions, and to Phillipa Malpas for including the peer leader programme in the curriculum. Thank you to Kimberly Farmer and the student counselling service in Auckland for supporting the peer leader programme and assisting with training and supervision, and thank you to Anne Ford from Oxford University for your excellent peer leader training manual.

Thank you to Craig Hassed and Monash University for the mindfulness CDs’ and advice. Thank you to the CALM website team, my fellow authors, Tony Fernando and Shailesh Kumar and to the web developers, Pauline Cooper-Ioelu, Iain Doherty, Craig Housley and Wen-Chen Hol. Thank you to May Dijkgraaf and Mildred Lee for your administrative support, and organisation, to Angela Robinson and Audrey D’Souza for your endless patience, to Anne Wilson Sue Foggin, and Frances Clements, skilful librarians, and to Juliette Allport at Scientific Writing for 3rd party editing and proof reading.
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1 Introduction

‘....as medical students, we are so out of touch sometimes. We can’t really share our concerns or worries because we have to appear to be at our best all the time. There is this underlying pressure to be perfect. And there is no way that can be conducive to good mental health I reckon.....’

Medical student (reflective diary entry)

This thesis focuses on the mental health and wellbeing of medical students. It proposes that empowering students to support themselves or other students can improve their mental health. The thesis consists of four components: three studies and a systematic review. This introductory chapter will establish the central concept and research questions for the thesis. It will move on to cover the underlying theory and rationale for the work, and will finish by outlining the thesis structure and boundaries.

In keeping with the theory of empowerment (2), ‘the student voice’ will be heard throughout the thesis, by beginning each chapter with a quote from one of the medical students that participated in the research.

1.1 Thesis Research Questions

The statement ‘medical students can be empowered to improve their mental health’ is the central proposition behind the work in this thesis. It is not however, the thesis hypothesis, as a research hypothesis would require a detailed prediction about how a specific intervention might be expected to influence a specific outcome (3).
As this thesis consists of a series of experiments focussing on self-care and peer-support in a population of medical students, it is not possible to state one hypothesis that will cover all of the studies. Therefore the candidate has written specific research questions for each of these studies, which are listed below:

The CALM Study:

- What is the use and acceptability of a web-based intervention to improve mental health and quality of life in a population of New Zealand medical students?
- What is the prevalence of depression and anxiety in a population of New Zealand medical students?

The Systematic Review:

- What is the current evidence for the effectiveness of peer-led interventions in improving the mental health and quality of life in secondary and tertiary students?

The Pilot Study:

- What is the feasibility of three different peer-led interventions to improve mental health and quality of life in medical students?
- What is the experience of being a peer leader and of being a peer-led-participant?
The Randomised Controlled Trial:

- What is the effectiveness of a peer-led intervention in improving mental health, quality of life and academic measures among medical students over a 6 month period?

1.2 Key Terms and Concepts

Mental health lies on a spectrum with illness towards one end and wellbeing towards the other. These following two terms will be used throughout the thesis, and therefore are defined below:(4)

**Wellbeing:** The term ‘wellbeing’ can represent a variety of meanings and concepts. To some people, it could simply mean ‘not being ill’, whereas to others, it could mean ‘flourishing’ or having an exceptional quality of life. In this thesis the term wellbeing will refer to all of these interpretations.

**Mental Ill-Health:** At the other end of the spectrum, the term ‘mental ill-health’ will be used to refer to a quality of health that is less than desirable. This term could encompass a diagnosable condition such as depression or anxiety, a low mood that is sub-syndromal or a quality of life that is less than optimal and is causing unhappiness or dissatisfaction.

1.3 Rationale for the Thesis

1.3.1 Background and Significance of the Research

Depression is one of the leading causes of disability worldwide (5). In New Zealand, 20.7% of the population has experienced a mental health disorder over the preceding year, and the projected lifetime risk of a mental health disorder is 46.6% (6). Co-
morbidity between anxiety, depression and substance abuse is common in New Zealand and is associated with increased risk of suicidal behaviour (7). Depression is one of the major risk factors for suicide; while support, resilience, coping strategies and treatment for mental disorders, are protective factors for suicide (8). The New Zealand Health Strategy states that one of the priority areas for population health is to reduce the suicide rate in New Zealand (9). Furthermore, mental ill-health such as depression has been shown to be a risk factor for highly prevalent physical illnesses such as coronary heart disease (10) and diabetes (11). Certain population groups are at greater risk of depression than others, and people at either end of the age spectrum are considered high risk (12).

In terms of young people, Youth 2007, a well-known New Zealand health survey has reported that there has been some improvement in the mental health of secondary school students as demonstrated by analysis of data collected in 2001 and then again in 2007 (13). This robust large-scale survey, involving over 9000 secondary school students, has provided much-needed data about the mental health of a portion of the youth population. However there has been no comparable New Zealand survey undertaken regarding the mental health of tertiary students. There is however, a large body of international evidence highlighting the growing nature of the mental ill-health of tertiary students (14-17) and the importance of prevention and early intervention (15, 18, 19). Although there may be the need for support for students with mental ill-health, there may not be the resources, as many tertiary institutions face funding shortages and reduced staff : student ratios (20). Therefore the candidate’s view, that students could be empowered to improve their own mental health, will possibly be of value in the current climate. Research into the effectiveness of self-care and peer-support interventions could be of worth to tertiary institutions that may be searching
for feasible solutions to the challenge of service provision. The mental health of medical students has been well-researched in many countries, (21-26) but only a few studies have been conducted in New Zealand (27-30).

The candidate’s research aimed to add to the international literature on tertiary student self-care and peer support by reviewing the evidence available and conducting three studies of interventions to improve mental health in medical students. The self-care website and peer support strategies that were developed and described in the thesis could be translated into other medical schools and used nationally and internationally if found to be successful.

However, the most significant point about this research is the possible impact of instilling healthy help-seeking behaviour in medical students in New Zealand. The participants in these studies are a high-risk group of young people who will evolve into the medical workforce. When doctors adopt a healthier lifestyle it not only improves their own health but also impacts on their credibility with patients (31), the way they talk with patients about these issues, and their ability to do their job (32-34). Providing preventative strategies to improve the resilience and mental health in medical professionals has potential health benefits for the medical workforce and their patients (34-36).

1.4 Underlying Theory and Conceptual Framework

1.4.1 The Research Paradigm

It is important to state at the beginning, the theoretical approach and belief system underpinning this research, as this viewpoint has affected the choice of study design, and the way the data have been analysed and interpreted. This has been described as
‘a lens that you can look through’ and clarifies the perspective taken (37). At the broadest level, a research paradigm comprises a way of observing and understanding the world. Within the paradigm, there are belief systems and theories that are linked to compatible methodologies. These theories exist in layers from broader abstract meta-theories to more specific hypotheses, and will affect the way that knowledge is produced and viewed (37). The research paradigm and theory used by the candidate is outlined in Figure 1.1. depicted in tabular form (37).
In this thesis the candidate has used critical realism as the analytical lens, ‘emerging adult theory’ and ‘empowerment’ (38, 39) as the theoretical tools, and experimental research as the methodology. This approach has assisted with placing the research in context and has helped to ensure that the type of research design chosen was the most appropriate one to use in order to answer the research questions.

The thesis comes from a post–positivist stance, namely that of a critical realist. A purely positivist stance would indicate that the candidate believed that there was a definite ‘truth’ that could be measured or observed. Certainly, the studies that make up this thesis do use instruments to measure quantitative ‘scores’ indicating higher or lower levels of mental health and wellbeing amongst a sample population of medical students. These measurements will then be compared using an experimental
methodology, which assumes that if other influences are balanced between the control and intervention group, then any difference between the groups at follow up, is due to the intervention. However, the candidate does not believe that analysis of these scores can provide a purely objective conclusive ‘truth’. Rather that the results may suggest likely conclusions, but that there is a possibility that other factors, which could have a bearing on mental health and wellbeing, should be taken into account alongside the experimental findings.

A critical realist’s perspective of research would be that entities exist that can be measured or observed. However this viewpoint would also deem that it is possible that the collection and interpretation of data could have been influenced by the perception of the researcher, the participants, and by the environment. For instance in this thesis, the researcher has chosen which questionnaires to use in the studies, the participants have filled out questionnaires (which have a subjective element), and the studies have all been conducted within the confines of a medical school environment.

Integral to a critical realism viewpoint is the concept that it is not possible to be one hundred per cent certain and that all measurements are fallible. Therefore probable conclusions only can be drawn, and theories may need to be revised. With this in mind, the candidate will revisit the initial proposal and research questions at the end of the thesis in the light of the results, in order to reach conclusions and generate new hypotheses.

A critical realist stance has been seen as an appropriate framework to guide research that involves both quantitative and qualitative methodologies (40). More recently, Blackwood et al have explored aspects of epistemological view-points in the context of health research, and concluded that a critical realist stance may in particular be a
helpful base from which to conduct some types of quantitative research, for instance, randomised controlled trials (41). They make the point that taking this position will enable the researcher to measure the efficacy of the intervention during the clinical trial, and then to also explore the effectiveness of the intervention; in other words how it could operate in the real world outside of an artificial research environment.

1.4.2 Theoretical Concepts

Underlying theory provides an important foundation for an intervention study, as it can help to provide a fuller understanding of the central issue and guide multiple aspects of the work. Theory can inform the processes used to develop components of the intervention, the choice of outcome measures, the exploration and explanation of possible underlying mechanisms (if the intervention were to effect the outcomes), or the ways that an intervention could be implemented into practice (3). For example within this thesis, if one of the peer-led intervention studies were to show that medical students did improve their peers’ mental health, then the philosophy of an underpinning theory might highlight possible underlying mechanisms that could have enabled this to happen. In this case, the theory could perhaps provide some insight into the behaviours, thoughts and attitudes of the students in the intervention group, and create possible explanations about how they might have been influenced by the intervention, or the ways in which their changed thoughts and behaviour could have affected the outcomes. In this way, theory can add knowledge, depth and meaningful interpretation that can enhance an intervention study. The two theoretical concepts that underpin this thesis are ‘emerging adult theory’ (42) and the concept of ‘empowerment’.


1.4.2.1 Emerging Adult Theory and Empowerment

In the year 2000, Jeffrey Arnett proposed that there was a distinct developmental stage for people between the ages of eighteen to twenty-five, and he called this stage ‘emerging adulthood’ (42, 43). Emerging adult theory was built on prior theories about the stages of human development, which considered that the period of ‘adolescence’ merged into the period of ‘young adulthood’. Arnett emphasised that these earlier theorists had indicated that the particular time period between these two stages of adolescence and young adulthood may be of interest. In his explanation of the development of emerging adult theory, Arnett quoted Erikson’s comments that ‘prolonged adolescence that was noticeable in industrialized society’, as well as noticing that Levinson and Keniston noted the ‘role experimentation’ that occurred during this time (42). Ten years after he proposed his theory, Arnett added to his original work by also stating that he believed that the stage of emerging adulthood was not just a transient generational phenomenon, and that a lack of understanding of this developmental phase was at the root of many negative perceptions of people in the eighteen to twenty-five age group (44, 45).

The basis for Arnett’s emerging adult theory was that there were three areas that presented evidence to support the concept of a distinct developmental stage: demographics, subjective experience, and identity exploration(42). He provided evidence of demographic change over the preceding twenty years by citing statistics showing that marriage and childbirth were now commonly postponed until the late twenties, whereas previously they had mainly occurred in the early twenties. Furthermore he showed that by the year 2000, there was a high rate of residential and educational change for people aged between eighteen and twenty-five. He concluded
that the demographics for this age group were diverse and unpredictable, and he used this to add strength to his argument that emerging adulthood should be a distinct developmental stage.

Arnett’s argument that emerging adulthood was distinct subjectively, was based on prior studies showing that the majority of young people judged whether they had reached adulthood or not, by reflecting on their feelings about this rather than by looking at more objective external factors (42). He proposed that this process involved firstly the development of character qualities which could enable the young person to accept responsibility and make independent decisions, which may lead towards the attainment of financial responsibility. Only once they had reached that point, he hypothesised, could young people experience a subjective change, view themselves as adults, and move into the next ‘stage’ of young adulthood. Therefore his argument was that whilst young people were going through this process, they were in a developmental stage that was different to either adolescence or young adulthood.

The third strand of Arnett’s reasoning focussed on the exploration of identity, in terms of love, work and world views (42). He clearly pointed out the differences between adolescents and emerging adults in these areas of life. He stated that ‘love’ in adolescence might centre around group social activities, whereas in emerging adults it may involve exploration about deeper levels of intimacy and may also be tied up with reflections about what sort of life partner would be suitable. To adolescents, ‘work’ might involve a job with a minimal skill requirement with a purely financial purpose, whereas emerging adults might work with a view to a future career, and may reflect on what they are good at doing or what they would find satisfying in a job. In terms of world views, Arnett points out that adolescents are more likely to still hold the views
and beliefs of their family and/or culture, whereas emerging adults are likely to be exploring other world views, re-evaluating their principles and values, and formulating their own belief systems. Throughout Arnett’s explanation of emerging adult theory, he highlights the significance of the changes, decisions, and opportunities that are made during this proposed developmental stage and their potential impact on a person’s future. He states that it can be an important time of exploration and self-development to be experienced before settling into an adult role.

One of the unusual concepts in Arnett’s theory is that he states that emerging adulthood is dependent on culture (46), and that therefore the developmental stage of emerging adulthood only exists in cultures where young people are ‘allowed’ to have a prolonged period of exploration because there is an expectation that adult commitments may be delayed.

Therefore in summary, the distinct features of emerging adulthood are: relative independence from social roles and expectations; the attainment of self-sufficiency by accepting responsibility and independent decision-making; and wide-ranging exploration, change and reflection about identity, roles, work, and relationships. In terms of the application of emerging adult theory to the work undertaken in this thesis, the theory or its components have also been used by other researchers working in a similar area. Dennett used emerging adult theory as a tool to describe the experience of peer educators in a tertiary education setting (47) and Cohen highlighted the significance of identity transformation in medical students (48). In the candidate’s view, Arnett’s theory has merit, as it has been based on decades of previous research and theory, provides sound arguments supported by evidence, and extends ‘the stages of human development’ into the twenty-first century thereby increasing its relevance for the current researcher. The candidate also believes that the central components of
emerging adult theory, such as autonomy, skill development and identity exploration, match the philosophy behind the thesis and are congruent with the theme of empowerment.

There are many examples of empowerment in the health literature, such as the recovery approach to mental health (49) and self-management of chronic conditions, for instance, chronic obstructive pulmonary disease (50). In the area of cardiac rehabilitation, there is evidence to show that therapeutic patient education (TPE) after an acute event can lead to effective self-management in terms of changing lifestyle and improving morbidity. Self-management techniques can include self-monitoring, goal-setting and action planning for relapse prevention (51). However there is less evidence for the effectiveness of TPE in reducing mortality (52). The self-management evidence from a review of the cardiac rehabilitation field highlights the need for further research about long-term adherence to life-style changes undertaken by empowered patients (52).

There are several models and conceptual ideas based around the concept of empowerment, rather than one accepted theoretical construct (38, 39). Lord and Hutchinson, who were involved in a series of empowerment studies in Canada, believe that it may be helpful to examine the issue of empowerment by first reflecting on the concepts of power and powerlessness. They state that in today’s society there are many sources of power, which may be economic, political, or social (53). In the candidate’s view, it is interesting to consider the dynamics of power that may occur in a medical school, an environment where senior staff can have a strong influence (54) and students have reported abuse and intimidation (55, 56).
One of the main empowerment theorists is Rappaport, who proposed that it could be a useful worldview from which to conduct research (57). The key elements in empowerment have been stated as being community or group involvement, active participation, mutual respect, and equal access or control over resources (39). Perkins and Zimmerman describe empowerment as a link between the wellbeing of individuals and the social and political environment, by stating that it highlights ‘the struggle to create a responsive community’ (58). In the candidate’s view, this statement could mean that empowerment embodies a ‘grass-roots’ or ‘bottom-up’ approach, rather than a hierarchical ‘top-down’ approach. Perkins and Zimmerman also emphasise the importance of empowerment as a strengths-based concept that turns the focus towards wellness, capabilities and opportunities, rather than illness, risk factors and problems (58). Such an approach is very relevant to the candidate’s research in which the interventions were designed to enhance wellness as well as prevent illness. Furthermore the importance of adopting a strengths-based approach when working with young people is strongly supported in the literature (13, 59, 60).

In summary the main components of empowerment are a strengths-based approach, the importance of respecting, engaging and encouraging people to take action, and redressing the balance of power by enabling those in a less powerful position to exert influence. These ideas have relevance for the concepts of self-care and peer-care (61) and are inherent in the interventions used in this thesis. The creation of a self-care resource containing resilience-building modules enables the students who use it to improve their own mental health whilst maintaining their privacy, dignity and self-respect. The implementation of a peer-support programme fosters a co-operative respectful culture of giving and receiving care between people of an equal power status. Empowerment therefore, is an important conceptual component of the thesis.
1.5 Structure of the Thesis

1.5.1 Outline of the Thesis

The research for this thesis about the mental ill-health and wellbeing of medical students consists of a series of three experimental trials, and the sequential outline is modelled on the UK Medical Research Council (MRC) Framework for the Development and Evaluation of Randomised Controlled Trials to Improve Health (62). The MRC framework is comprised of five consecutive stages that are chronological, but which can overlap, and are shown below in Table 1.1.
Table 1.1: Medical Research Council Framework for the Development and Evaluation of Randomised Controlled Trials to Improve Health

<table>
<thead>
<tr>
<th>Stage</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preclinical: Theory:</td>
<td>Exploring relevant theory and evidence and formulate hypothesis. Formal literature review and informal information-gathering from relevant population.</td>
</tr>
<tr>
<td>Phase I: Modelling</td>
<td>Identify underlying mechanisms, components of intervention and outcomes to be measured. May include interviews, surveys and observational studies.</td>
</tr>
<tr>
<td>Phase II: Exploratory Trial</td>
<td>Feasibility of components of intervention and of protocol. Determine appropriate comparator. May include interviews, surveys and observational studies.</td>
</tr>
<tr>
<td>Phase III: Definitive</td>
<td>Compare fully defined intervention with appropriate alternative. Study must have appropriate statistical power.</td>
</tr>
<tr>
<td>Randomised Controlled Trial</td>
<td></td>
</tr>
<tr>
<td>Phase IV: Long Term Implementation</td>
<td>Generalisability and long-term implications</td>
</tr>
</tbody>
</table>

The thesis structure is best illustrated by two diagrams (Figures 1.2 and 1.3). One of these shows a longitudinal outline, and the other demonstrates the contextual setting for the work. In conjunction with the underlying theory described above, these two diagrams work together to create a structural framework for the thesis. An outline of the thesis, incorporating the MRC framework, is shown in Figure 1.2. This longitudinal sequential outline of the thesis chapters depicts the development of concepts and the progression of work throughout the time-frame of the thesis.
Figure 1.2: Longitudinal Outline of Thesis

CHAPTER 1
INTRODUCTION

Background and significance of thesis topic
Research paradigm and theory
Thesis longitudinal structure and boundaries

CHAPTER 2
THE LITERATURE REVIEW

General population mental health
Youth mental health
Tertiary student mental health
Medical student mental health

CHAPTER 3
THE CALM STUDY
(SELF-CARE)

CALM aims, research questions and methods
CALM results and discussion

CHAPTER 4
THE SYSTEMATIC REVIEW
(PEER-CARE)

SR aims, research questions and methods
The theory and rationale behind peer support
SR results and discussion

CHAPTER 5
THE PEER INTERVENTION TRIALS

Peer-led intervention pilot study
Peer-led intervention RCT

CHAPTER 6
DISCUSSION

Main findings of thesis
Strengths and limitations
Thesis discussion, conclusion and implications
The second diagram to illustrate the thesis structure is a contextual setting, which places the thesis work in perspective. The candidate believes that the topic of the mental health of medical students should not be considered in isolation, and has constructed a diagram to illustrate this concept (Figure 1.3).

This diagram shows that there are a broad range of protective and vulnerability factors that could have an influence on mental health, and acknowledges their importance (63). There are, for instance, environmental factors that may influence the mental wellbeing of all people, such as the cultural, social or political climate (64-66). Next, there are factors that may shape medical students when they are young people, prior to their acceptance into medical school (59, 67). These factors could be internal, such as genes, personality traits and beliefs, or they could be external, such as the home or school environment (13, 68, and 69). It is possible that the process of selecting which students are accepted into medical school may also have a bearing on the levels of mental ill-health in medical students (25, 70). Additionally, the diagram illustrates the fact that whilst at medical school, the medical school environment itself could have an influence on the students’ mental health and wellbeing (29, 56, 71, Maida ref). Finally, the diagram shows that when medical students become doctors, all of these previous factors, plus many additional ones such as their career choice and level of professional support, may influence their mental health and wellbeing during their careers (26, 72-76).

In serving as an introduction to this thesis, the conceptual setting diagram also acknowledges the focus, boundaries and limitations of this piece of research. The environmental factors shaping the bigger picture will not be explored in this series of experiments, although they have been drawn on to provide background information.
Similarly, in-depth interpretation of the beliefs and prior experiences of the individuals in the study population are beyond the scope of this research, although they have been considered in order to inform the intervention development and to add to the discussion.
Figure 1.3: The Contextual Setting for 'Empowering Medical Students to Improve Their Mental Health'

- Influening Factors: Pre-Medical School Environment
  - Resiliency Skills
  - Physical Health
  - Personal Support
  - Genes and Development
  - Emotional Intelligence
  - Personality Traits
  - Previous Experience
  - Risk Factors

- Medical School Environment
  - EMPOWERED MEDICAL STUDENTS
    - SELF-CARE (Help-seeking)
  - PEER-CARE (Help-providing)

- Influencing Factors: Professional Environment
  - Reflective Practice and Mindfulness
  - Professional Support
  - Social Connection
  - Meaning, Purpose and Values
  - Work/Life Balance
  - Working Environment
  - Autonomy
  - Creativity

- Selection Process

The shaded areas highlight the focus of the research undertaken for this thesis
This chapter has provided the central concept and research questions for the thesis, and has provided a brief background introduction to the thesis topic, whilst addressing the significance of the research. The research paradigm and underlying theory have been described. Finally, the thesis structure has been illustrated by providing a longitudinal outline of the sequence of chapters, along with a contextual setting to place the research in its wider context. The next chapter, which is a literature review, will cover many of the issues shown in this contextual diagram.
2 Literature Review

“I had previously been aware of the general opinion that stress and depression rates were higher in medical students, but researching and reading the relevant literature distinctly underlined this. The common knowledge that I had accepted was reinforced by scientific knowledge, percentages and statistics all emphasising the fact that med students – stubborn, self-conscious, driven and determined to put up a strong infallible façade as we are, are at extremely high risk for adverse psychological states and events.”

Third year medical student

(on writing an essay about the help-seeking behaviour of medical students)

2.1 Introduction

The previous chapter outlined the thesis concept, theory and structure and placed the thesis topic in its wider context. This chapter will start with a discussion about the concept of resilience, and will move on to review important issues regarding mental ill-health in the wider population. This will be followed by a summary of contextual factors that should also be considered when discussing the mental health and wellbeing of young people. The next section will focus specifically on the tertiary student population with regard to the prevalence of conditions, the transition to tertiary education, students’ help-seeking behaviour, the causes and consequences of mental ill-health, and possible interventions and recommendations. At the end of each section about tertiary students, evidence of specific relevance to medical students will be presented.
2.2 Resilience

Resilience can be defined as “a dynamic process where individuals exhibit positive behavioural adaptation when they encounter significant adversity or trauma” (77). The concept of resilience in mental health was highlighted in the 1960s’ with Zubin and Spring’s stress-vulnerability model, which focussed on the susceptibility of some individuals to developing mental illness (78). Resilience as a theoretical construct was later explored by Luthar, who summarised and addressed some of the concerns and ambiguities and proposed solutions to strengthen the concept of resilience as an underpinning theory for research (77, 79). Kumpfer et al also extended the original concept of resilience, an interplay of biological, genetic, environmental and cognitive factors, by suggesting that ‘having a purpose in life’ should be added as an additional factor (80).

Ong et al explored the concept of resilience in older adults and stated that ‘trait resilience’ was part of personality, and that this trait could affect resistance to stress and recovery from stress (81). They postulated that the resiliency trait might aid positive adaptation by helping the person to “sustain access to daily positive emotions” (81). They theorised that if positive emotions were present during times of stress, then these emotions could interrupt the stress experience, which could enable that person to adapt more quickly to stress in the future. They also suggested that resilient qualities needed a “scaffolding of quality social supports”, which could be provided by enhancing the environment (81).

One of the resilience models with relevance to this thesis is a ‘coping reservoir’ model, which was developed for medical students (82). This model explores the complex interplay between resilience, psychological distress and burnout. In the coping reservoir model, the
authors use the term resilience to mean ‘less vulnerable’. They suggest that for each student, there are a variety of factors that can deplete their individual coping reservoir such as demands on time and internal conflict. They also suggest factors that can replenish the reservoir, such as mentorship and intellectual stimulation. The authors propose using the model as an intervention and method to examine the strengths and vulnerabilities of each student who requires assistance.

In terms of promoting good mental health and preventing illness in medical students, it would seem appropriate to focus on the development of ‘stress-resistance’ rather than resilience. Much of the child and youth mental health literature has centred on studying interventions which enhance child or adolescent development after adverse life events (80), and therefore the term ‘resilience’ has been used to capture the concept of impact and recovery. Resilience usually refers to the ability of a person to recover from a sudden decrease in functioning, often due to exposure to severe trauma. Stress-resistance, on the other hand, is the ability to withstand the stress in the first place and to have a minimal decrease in function in response to stress. The term stress-resistance is used more often to describe the response to on-going daily stress, rather than when there is one particular major stressor (83).

2.3 Detecting Mental Ill-Health and Wellbeing

All three of the candidate’s studies in this thesis involve documenting the prevalence of depression and anxiety in medical students in New Zealand, as there are currently few studies that provide this information (27). Therefore, a short discussion about screening tools that
can be used to estimate prevalence of depression and anxiety is presented below. The definition of screening by the New Zealand National Health Committee on Screening is:

“A health service in which members of a defined population, who do not necessarily perceive they are a risk of, or are already affected by, a disease or its complications, are asked a question or offered a test to identify those individuals who are more likely to be helped than harmed by further tests or treatments to reduce the risk of disease or its complications” (84).

The factors that must be taken into account with screening tests are the safety, accuracy and reliability of the test(84). Also the test must have a good balance of sensitivity and specificity. If a test is highly sensitive a high proportion of those people with the disease will be identified. If it is not very sensitive it will miss picking up many of the people who do have the disease i.e. there will be too many false negatives. If a test is highly specific it will have a good ability to rule out the disease in people who do not have the disease. If it is not very specific then it will identify a higher proportion of people as having the disease when they in fact do not have the disease i.e. there will be too many false positives. Screening tools tend to be sensitive but not very specific, so they may over-estimate prevalence by detecting false positives. For example the Hospital Anxiety and Depression Scale (HADS) has a sensitivity of 80% with a specificity of 69% at a cut off score of 6 for detecting depression (85), and a two-question verbal screening tool for depression has a sensitivity of 97%, but a specificity of 67% (86).

Although there have been a variety of instruments developed to screen for depression (86-90), relatively few tools have been developed to recognise anxiety (91, 92) and
these tools were not often used as part of routine clinical practice (93). In 2006, Means-Christensen et al stated that guidelines recommending screening for anxiety were scare and that the focus had been primarily on depression (94). Katon and Rob-Byrne agreed with this statement a year later, calling anxiety disorders “the neglected stepchild of primary care–based mental health care” (93). However, some self-administered anxiety screening tools have been developed which are short and have been validated in primary care such as the Generalised Anxiety Disorder seven-item (GAD-7) (95) and two-item (GAD-2) questionnaires (96). There is considerable overlap of anxiety and depression in primary care (7, 97, 98), and some tools which screen for both anxiety and depression have been validated in a primary care population such as the Hospital Anxiety and Depression Scale (HADS) (85) and the Anxiety and Depression Detector (ADD) (94). Alongside screening for mental ill-health, the Case-finding and Help Assessment Tool (CHAT) also screens for risky lifestyle behaviours such as alcohol and tobacco use and problem gambling (99).

There are several concepts to be taken into account when choosing a mental health screening instrument. Different tools also vary in their capacity to be able to measure response to treatment over time (100, 101), to be diagnostically aligned with the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV), and to assess the severity of symptoms (85, 88). Some are also self-administered whilst others are administered by a practitioner (102). The instruments selected for the candidate’s studies were the Primary Health Questionnaire (PHQ-9) (103), and the Generalised Anxiety Questionnaire (GAD-7) (104), as these are well-validated self-report instruments and can detect change in depression and anxiety over time. Several studies have shown that these tools are also able to generate scores
for different levels of severity so they may detect dysthymia as well as severe depression, for example, and they are highly sensitive as well as highly specific. These tools will be discussed in more detail later in the thesis (95, 103).

2.4 Mental Ill-Health and Wellbeing in the Wider Population

In New Zealand, 20.7% of the population has experienced a mental disorder over the preceding 12 months and in people attending general practice, it is one in three (7, 105). Alongside this, we know that there is a low rate of diagnosis of anxiety and depression (98). One US study, which examined a primary care population, stated that only 56% of people with depression and 23% of people with anxiety states had the conditions recognised (106). Similarly in New Zealand, it has been shown that general practitioners are less likely to detect psychological symptoms than physical ones (107).

Commonly the anxiety disorders are longstanding conditions, and many people will suffer fluctuating symptoms over long periods of time (108). With early treatment, people have the opportunity to learn skills that can help them to manage or prevent future episodes (109). Without this assistance, the condition may persist for many years with implications both for the anxious person and for the cost to the healthcare system (106, 110). People with generalised anxiety disorder have been shown to make more visits to Emergency Departments, hospitals and pharmacies as well as receiving high numbers of investigations (106).

There is evidence that self-help interventions for anxiety do improve outcomes (111). A Cochrane review of self-help interventions for anxiety disorders in adults analysed 92 studies in a quantitative synthesis comparing self-help with no treatment, and self-help with
face-to-face psychological assistance (111). The conclusions from this review were that self-help interventions were associated with a greater response in symptoms of anxiety than occurred with no treatment, but that some results were hard to interpret, which limited the generalisability of the findings. This review also concluded that self-help may be less effective than face-to-face CBT (111). Screening for depression has been shown to improve outcomes, when it is integrated into a programme of care comprised of accurate assessment, treatment and follow up (112). There is evidence that collaborative care leads to improved outcomes for depression (113) and anxiety when compared to treatment as usual (114).

The morbidity and distress that untreated depression and anxiety may cause are significant (115). With anxiety, even a small improvement in symptom control can lead to an improved ability to function. For an individual, this can make a big difference in coping with the day to day practicalities of daily living (116). Furthermore, depression may be associated with a number of somatic symptoms that can also contribute to a reduced quality of life (117). Clearly, depression and anxiety are under-recognised and under-treated whilst also causing significant morbidity and mortality (106). If these common conditions were picked up during adolescence and early adult life, interventions could be put in place to prevent or mitigate possible future negative consequences (15). This underlines the significance of the detection and management of mental ill-health in young people and the promotion of their wellbeing, as well as allaying immediate consequences to the young person such as lowered quality of life or even suicide (118, 119).
2.5 Youth Mental Ill-Health and Wellbeing

Studies from the field of youth health highlight several key underlying factors that may influence the health behaviour and outcomes of this population. These include societal, generational and environmental influences (64, 120, 121), the developmental stage of people in this age group (122), their attitudes, motivation and resilience levels (123-125) and the effect of parenting and families (80, 126, 127). It is clear that some of these factors are inherent within the individual, whereas others are environmental (66, 67, 120, 128, and 129). In fact, mental health often involves a complex interplay between the two, as illustrated by the stress-vulnerability model, where an individual’s resilience threshold influences their response to daily stress and life events (78).

However, one could also consider this interplay of individual and environmental factors in more vertical terms by applying what has been termed a ‘transformational process’ (130). The transformational process is a model that is used by Hawkins as a way of understanding cultural influences on a person’s beliefs and behaviour. However, the candidate proposes that this model could also be applied to the youth mental health field, which is of a similarly complex and multi-factorial nature. The model describes a process whereby each individual makes their own interpretations and decisions and exhibits behaviour that can be unique, but in doing so they draw upon their underlying world view and belief system, which may be common to many people (130). The core underlying belief system may have been established for some time; whereas the interpretations, decisions and behaviour may be more immediate reactions. However, both can have an impact on the way a person responds. Some of these influencing factors will be considered in more detail below.
An emphasis on societal factors was highlighted in a recent UK report from the Royal College of Psychiatrists, which stated that the wellbeing of young people in the student age group was being affected by social changes such as higher rates of family breakdown, less financial support and the economic recession (4). This societal focus is supported by Richard Eckersley, a well-published Australian researcher and government advisor, who reports that young people’s mental health has in fact got worse over several generations and suggests that this is caused by ‘features of modern society’ (65, 131). He argues that there is a need to improve social conditions for this whole age group and not just those who are unwell (64). Eckersley’s research paints a picture of youth with unrealistic expectations, who are unsure of their identity and place in society and are becoming unwell.

Stating that young people have become more motivated by financial gain and less motivated by inner beliefs and values, Eckersley says:

“...Our cultural focus on the external trappings of ‘the good life’ increases the pressures to meet high, even unrealistic and inappropriate, expectations, and so heightens the risks of failure and disappointment. It leads to a constant need to make the most of our lives, to fashion identity and meaning increasingly from personal attributes, achievements, possessions and lifestyles, and less from shared cultural traditions and beliefs. It distracts us from what is most important to wellbeing: the quality of our relationships with each other and the world, which contribute to a deep and enduring sense of self-worth and existential certainty...” Richard Eckersley (132)

This statement has not been published in a peer-reviewed journal, and it is not possible to assess the quality of the research and validity of the findings. However Eckersley’s message
is supported by other research. Studies have been conducted that show that people who are intrinsically motivated, for example by the pursuit of personal growth, have higher levels of wellbeing than those who are extrinsically motivated, for example, by money (133, 134). There is a scarcity of robust research that has been conducted in this area. However, the candidate’s view is that as intrinsic motivational factors encompass values and an ability to reflect, these skills are likely to be beneficial to self-development and to creating a sense of meaning and purpose for that individual, although this would need further research to determine. A more extrinsically motivated person may be less accepting and altruistic and have less-well-developed skills such as cognitive flexibility and re-appraisal, which could make them less resilient and more vulnerable to mental ill-health (69, 80). Furthermore, a passive coping style has been shown to be a predictor of depression (135).

The developmental stage of a person may also influence their ability to cope with stress, as it can influence their level of maturity of cognitive functioning. The capacity for abstract thinking develops throughout adolescence (122). A review of the evidence in this area stated that there were indications from magnetic resonance imaging (MRI) studies that changes in brain structure continue after adolescence, and that the brain may not fully reach maturity until the age of thirty (136). This clearly has implications for the mental health of young people. Abstract thinking enables a person to project into the future and to conceptualise the possible consequences and outcomes of an action (122). Thus it is an important part of risk-taking, decision-making, problem-solving and planning processes. As well as this, young adults are also developing a sense of identity, and may be doing this in a new environment, away from the traditions, culture and values of their family of origin (48).
There may also be barriers encountered by young people, which prevent or deter them from accessing mental health services. Transport, affordability and fear of lack of confidentiality were among the most common barriers to accessing health care among secondary school age students, as cited in the Youth 2000 study in New Zealand (137). Although the population in this study was a younger age-group than a tertiary student population, it appears that many of these factors remain as barriers at University. Other studies have found similar barriers for medical students, with fear of lack of confidentiality being of primary concern, and cost and stigma still being a barrier (138, 139). In New Zealand, the National Depression Initiative has addressed the issue of stigma and help-seeking by introducing a national advertising campaign featuring high profile speakers. An evaluation of this campaign after three years, demonstrated an improvement in help-seeking behaviour in the general population including those in the age 15-24 year old age bracket (140). Similarly, in Australia, a public health campaign, ‘beyondblue: the national depression initiative’, has been shown to have had a positive effect on the general public, in that there was an improvement in beliefs about seeking help and the benefits of treatment, in the Australian states where the campaign had been funded (141).

2.6 Tertiary Student Mental Ill-Health and Wellbeing

2.6.1 The Prevalence of Mental Ill-Health in Tertiary Students

This section will start with a discussion about some of the issues concerning the collection and reporting of mental health prevalence data, followed by a consideration of the evidence regarding the types of mental ill-health that affect tertiary students. Lastly, this section will report some of the statistics about the prevalence of mental ill-health in tertiary students.
Two key issues, when examining the prevalence of mental disorders, are the broad range and definition of types of disorder, and the variety of instruments and methods used to collect data. Regarding the mental ill-health and wellbeing of tertiary students, there have been studies that have measured depression and anxiety (118), stress levels (142), psychological or mental distress (143), emotional disorders (144), suicidal thinking (145), burnout (146) and quality of life (147). Such a diverse range of conditions and overlapping terms can make it difficult to make comparisons between studies. The different terminology used to describe conditions of mental ill-health was signalled as a key problem in a recent report by the Royal College of Psychiatrists in the United Kingdom, which stated that this variability in definitions affected the ability to collect accurate data regarding the prevalence of disorders in students (4). Furthermore, even when instruments are measuring the same construct or disorder, for instance, depression, they may have different definitions of what constitutes ‘mild’, ‘moderate’ or ‘severe’ depression (148). Some would even argue that mental health or ill-health cannot be assessed by a quantitative score alone, that ‘labelling’ of mental ill-health conditions is unhelpful, and that human distress is a complex issue encompassing a spiritual dimension, and requires a more holistic approach (149). For the purposes of this thesis, quantitative scores will be used to assess prevalence and change in mental state over time. However, the candidate acknowledges that such measures may focus on certain significant aspects of the mental health and wellbeing of the students in the sample at the expense of others.

When reviewing the incidence and prevalence of mental health disorders in a population, it may also be important to consider the age of onset of conditions. Many mental disorders have their first presentation before the age of 24 years, typical of the age of the tertiary student
population (6). The high risk period for developing bipolar disorder and schizophrenia is in fact between late adolescence and early adulthood (4). Therefore a study that compares the number of episodes of mental ill-health prior to tertiary education, with the number of episodes that occurred during tertiary education, may reflect more the pre-disposition of that age-group than environmental factors (150). To investigate the environmental influences on the prevalence of mental ill-health, a study that controlled for age and background would be more useful (151).

The 2011 National Survey of Counselling Centre Directors in the US reported that 91% of the directors believed that there was a recent trend of an increasing number of students with severe psychological problems attending their counselling service (152). Seventy-eight per cent of the directors also stated that over the preceding five years, there had been an increase in student crises that had required an immediate response. This was a survey of 228 centres serving 2.3 million students (152). However, Hunt et al questioned whether this finding reflects a real increase in prevalence, or whether it could be due to changes in diagnostic criteria or increased help-seeking behaviour amongst students (139). Hunt et al state that if there has in fact been a real increase in the prevalence of mental ill-health in students, then this is not consistent with data from studies of this age group in the general population, which appear to show minimal change over recent years. This led them to postulate that the increased prevalence of mental ill-health in the student population could be due to college-specific factors. In terms of severity of mental ill-health, the authors state that it does appear that the prevalence of more severe disorders amongst students has increased over time. Hunt et al also suggest that the people who are applying for university may have higher levels of mental ill-health than applicants in the past. They propose that increased treatment of mental
ill-health in childhood and adolescence could increase the likelihood of young people with disorders, such as depression and attention deficit-hyperactivity disorder (ADHD), being able to achieve the necessary academic standard to apply for tertiary education (139).

One recent Australian study compared students enrolled in different courses (medicine, law, psychology and mechanical engineering) with each other and to peers in the general population aged between 16 and 24 (153). The study found that these students reported a distress rate that was 4.4 times higher than that reported by the general population group, and that the law and engineering students were significantly more distressed than those studying psychology and medicine (153). However, this study did not adjust for socio-demographic status. Furthermore, the data used for comparison from the general population was historical as it was taken from a South Australian survey conducted between 2002-2004, which was three to five years prior to the collection of the student data in 2007. The candidate proposes that it is possible that within this time period, environmental factors could have influenced levels of distress in the general population. If this study had used a general population comparison group from a survey conducted in 2007, it would have been more relevant. It is also worth noting that all studies that use the general population as a comparison group, are not comparing students to ‘non-students’, because the general population will include both of these groups.

Blanco et al investigated student and non-student groups by examining data from ‘The National Epidemiological Survey on Alcohol and Related Conditions’ (154). This national survey was a large face-to-face survey performed in the US in 2001-2002, which identified a nationally representative sample of the population (n=43 093) using census data, and conducted fact-to-face interviews using a diagnostic tool aligned to the Diagnostic and
Statistical Manual of Mental Disorders (DSM-IV). For the purposes of Blanco’s study, data from a sub-sample of 5092 of people aged 19-25 were analysed (154). A general finding from Blanco’s study was that psychiatric disorders were common in this age group in the overall sample, as almost half of those surveyed reported having had a psychiatric disorder in the previous year. Twelve month prevalence for any ‘DSM-IV Axis 1’ psychiatric disorder, personality disorder or substance use disorder was recorded. In terms of comparing the two groups, the overall rate of psychiatric disorders was the same in the student and the non-student groups. However, students were more likely than their non-student peers to have been diagnosed with alcohol dependence in the preceding 12 months, but less likely to have a diagnosis of drug use disorder, nicotine dependence, bipolar illness, personality disorder and conduct disorder. Students were also less likely to have received treatment for alcohol and drug disorders in the previous year, than were non-students. These findings comparing alcohol and drug use between students and non-students have been supported by other more recent studies as reported in Hunt’s review of the literature (139).

As well as using a comparator of ‘non-students’ rather than the general population, other strengths of Blanco’s study are that it used validated measures obtained in face to face interviews, and that it adjusted for socio-demographic characteristics in the comparison groups. However, the validated measures used were aligned to DSM-IV diagnoses only, and did not take into account other aspects of the measurement of mental ill-health, which some argue can be conceptualised and assessed from many angles (155). A further point to note is that data from this study are now over 10 years old, and similar research on a large scale with more up-to-date data would be of interest. More recently, an Australian study compared the prevalence and severity of mental ill-health in 6479 Australian students to records from
national prevalence studies, using the same instrument to collect data (156). This study found that rates of mental ill-health in the student group were significantly higher than in the general population. Interestingly the study also compared the prevalence results from the general student group to prevalence results of mental ill-health in university health centre patients. The results showed that the general student sample prevalence of mental ill-health was twice that of those attending the university health service as patients, suggesting that the students who are the most unwell may not be seeking help.

In considering the types of common presentations of tertiary students who have mental ill-health, one study from the United Kingdom reported that 27% of a sample of university students reported having had at least one episode of self-harm in the past, and that 10% of the students stated that they had self-harmed whilst at University. Interestingly, psychology students reported significantly more self-harm than other students. This study also found that students with higher self-harm scores also had higher scores on negative rumination, maladaptive coping mechanisms and difficulty in identifying emotions (157). Self-harm in students has also been found to be highly correlated to depressed mood, alcohol and drug use, and issues regarding sexual identity (158).

In terms of alcohol use, Tosevski points out that although it may be easy to think of drinking as part of the normal social culture of the university, in fact many students who have been admitted to hospital due to alcohol intoxication, also have had symptoms of anxiety and depression (158). In New Zealand, the MagPie study clearly showed this overlap of co-morbidities in a primary care population (7). A possible implication of this evidence from the MagPie study is that it would make sense to look for co-existing disorders in terms of assessment and management, rather than focussing on one condition in isolation. This
statement is also of relevance to the student population, as studies examining disorders in this age group have also shown the likelihood of overlapping conditions (59).

Hunt et al also summarised the sub-groups of students who have a higher prevalence of mental ill-health than students in general (139). These included students with low social support or relationship stress, students at the lower end of the socioeconomic scale, and those who have been victims of sexual violence. The authors also stated that although female students have a higher risk of depression, suicide is more common amongst males (139). Stallman et al also showed that female students recorded higher levels of distress than male students, and also identified second year students as being more distressed than first year students (156).

2.6.1.1 The Prevalence of Mental Ill-Health in Medical Students

In order to gain a sense of perspective, the candidate has decided to mainly report key international prevalence studies that use a comparator, for instance the general population or another student group, or to report conclusions from systematic reviews about the mental health or wellbeing of medical students. Even so, as the range of psychological conditions and measures used is so wide that it may not be possible to generate firm conclusions in terms of direct comparisons between studies and populations. It will however, be possible to create a broad picture of the mental ill-health and wellbeing of medical students. The synthesis of the international literature will be divided into three sections: psychological stress or distress, quality of life, and anxiety and depression, which will also include studies on suicide. Finally some of the literature describing burnout in medical students will be discussed.
2.6.1.1 Psychological Stress or Distress

Dyrbye’s systematic review of psychological stress in US and Canadian medical students, reviewed 40 studies, and provides the most robust evidence in this area (21). The review concluded that levels of distress amongst medical students were consistently higher than those in the general population (21). Similar results were found by Firth-Cozens in the UK (159). Another British study reported that medical students at three Universities showed stress levels above those in the general population, with an estimated prevalence of 31.2% of emotional disturbance, which is similar to that reported in the US (160). Leahy’s recent study in Australia also quoted rates of distress that were four times higher than those of the general population (153). However, a historical comparison group was used in this study. In summary, the majority of studies have found that medical students have higher levels of stress than the age-matched peers in the general population, and there are only a few studies which state that levels of stress for medical students are acceptable or are below the stress levels of the general population (161, 162).

In terms of a comparison of the stress levels of students studying medicine with the stress levels of students studying other subjects, the literature does not give a definitive answer. Carson found no difference in psychological stress between a medical and non-medical student group (24). Helmers reported medical student stress as being slightly less than the stress reported by law students and graduate students (163), and Leahy reported that psychology, law and mechanical engineering students were more distressed than medical students (153). However the important point of difference between medical students and other students is that the mental health of medical students can have an impact on patient care or attrition from the medical profession (21). An example of this is that a medical student
who is experiencing burnout may become cynical and detached, their empathy may be affected (164) and they may not complete their medical training (165)

2.6.1.1.2 Depression and Anxiety

To give a general idea of the scale of the problem, a large US study, which surveyed 3080 medical students, found that 49% of the students reported depressive symptoms (166). Dyrbye’s systematic review states that levels of depression and anxiety are higher in medical students than in the general population (21). Similarly, a Swedish study, which using matched controls, found the prevalence of depressive symptoms in medical students was 12.9% and that this was significantly higher than in the general population (151). In the Netherlands, Zoccolaiono used DSM-III criteria to record the incidence of probable major depression in the first and second year at medical school in the 1980s, and found it was 12% (25). The lifetime prevalence was 15%, which was three times greater than the rate in the general population. This study was conducted by first assessing students with the Beck Depression Inventory (BDI), with higher scoring students then being assessed at interview with the NIMH Diagnostic Interview Schedule, which provided a higher level of validity than many prevalence studies that used self-reported screening tools alone. From the literature, it does appear that medical students have higher rates of depression and anxiety than the general population in the countries where this has been measured.

Vitaliano compared the anxiety levels of medical students with those of people attending a psychiatric outpatient clinic, and found that 34% of the students had anxiety scores above the median for outpatients (167). There are few studies that have been conducted in this area in New Zealand. However one New Zealand study found that the rates of depression and anxiety were lower in medical students than in a group of students from nursing, architecture and health
science courses (27). However, there were significantly more female students in the non-medical comparison group in this study compared with the medical students, which may have accounted for this difference, as it appears clear in the literature that female medical students generally exhibit higher levels of stress and depression than male medical students (21, 151). This finding of a gender difference in rates of mental ill-health is supported by the statistics from The New Zealand Mental Health Survey, which showed that the lifetime prevalence of suicidal ideation and suicide attempts were consistently significantly higher in females than in males (6). This was also shown to be true of female doctors working as residents, who reported more symptoms of anxiety and depression than did male doctors (37% compared with 10%) (168).

2.6.1.2.1 Suicide

In 1981, Okasha et al examined the different range of suicidal feelings in medical students in Denmark where he found a prevalence of 12.6% reporting suicidal feelings of some sort in the last year (169). The students reporting suicidal feelings also reported more symptoms of depression and somatic illness, as well as having experienced more stressful events, than the other students in the study. In the whole sample of medical students, in the preceding year 5.6% had felt that life was not worthwhile, 4% had wished they were dead, 1.7% had thought of taking their life, 0.9% had seriously considered suicide or made plans, and 0.4% had made an actual suicide attempt (169). Nine per cent of 4th year medical students reported suicidal thoughts in a US study that was carried out across 16 medical schools in 2008 (169). Factors shown to be independently associated with suicidal thinking were the amount of stress experienced in the past year, the number of days of ‘bad mental health’ in the past month, and perceptions about the medical school’s system for coping (22). A cross-sectional and
longitudinal cohort study across seven US medical schools recorded that 11.2% of students reported suicidal ideation within the last year. Burnout and lower mental quality of life scores at baseline were found to be independent predictors of suicidal ideation (170).

All of the above studies have been measuring medical students’ suicidal ideation, but not measuring actual suicide attempts or numbers of completed suicides. A Swedish study measured this actual data and showed that 2.7% of students had made suicide attempts at some time in the past (151). A large study that collected data from 101 of the 126 US medical schools reported 15 suicides over a 4½ year period, which was a lower suicide rate than the authors expected (171). The authors concluded that their study highlighted the need for standardized reporting of suicides at medical schools. Of the 15 students who had committed suicide, 14 of them were men, 13 of them had past psychiatric histories and 10 of them were in their 3rd or 4th year. The predictors for suicidal ideation were found to be “lack of control, personality traits, single marital status, negative life events, depression and anxiety” (171). Prospectively, suicidal thoughts and vulnerability as a medical student predicted suicidal ideation after graduating (26).

A Norwegian study looking at suicidal thoughts and attempts in medical students found that the lifetime prevalence of suicidal thoughts was 43%, with 8% who had planned suicide and 1.4% who had attempted suicide (26). The conclusion was that although suicidal ideation in medical students was high, actual attempts were low. The candidate agrees with this hypothesis, as it fits in with the data from the many studies documenting high levels of suicidal ideation but low numbers of completed suicides.
Whilst the literature indicates that the prevalence of stress, anxiety and depression is higher in medical students than in the general population, the prevalence of personality disorders has not been shown to be any different (172). Other studies have collected data measuring quality of life scores for medical students. One large US survey reported that medical students had lower quality of life scores than the age-matched general population (166), and Dyrbye’s systematic review supported this finding in US and Canadian medical students (21). Two New Zealand studies have assessed the quality of life of medical students (27, 147). One study found that medical students reported a higher quality of life than students from nursing, pharmacy, architecture and health science departments (27). The other study compared quality of life scores between international and domestic medical students and found that international students had lower social and environmental quality of life scores (147).

2.6.1.1.3 Burnout

‘Burnout’ can be defined as a response to chronic emotional and interpersonal stressors due to work (173). Maslach’s multi-dimensional theory of burnout states that it is defined by three core dimensions: emotional exhaustion, feelings of cynicism and detachment and a sense of ineffectiveness (173). The relationship between stress and burnout is complex. Emotional exhaustion, one of the three components of burnout, has a reciprocal relationship with stress. Therefore a high stress level can cause emotional exhaustion and vice versa (174). Depression and pessimistic thinking are two key factors that can influence quality of life and have been linked to burnout (29, 175). A direct relationship between suicidal thoughts and the onset of burnout, independent of depression, has been reported in medical students (170). Contributing factors include both individual factors (personality traits and
personal life events) and workplace factors (work culture, workload and experience of training (21, 29, 176).

There is some evidence to suggest that burnout may have its origins in medical school and that along with other forms of mental morbidity, it could be prevented through early intervention (176, 177). The large US survey of 3080 medical students mentioned above that found 49% reported depressive symptoms, also found that 47% of the students reported burnout (166). They also had lower quality of life scores relative to the age-matched general population. The level of burnout, but not depression, was higher in students who were not in the ethnic minority students when compared to students who were in the ethnic minority (166). In another similar study, burnout levels were found to be the same in both minority and non-minority students, but the non-minority students also reported lower quality of life and sense of accomplishment (178). The finding that approximately 50% of medical students report burnout has been replicated by several studies (170) (170). Burnout in medical students can have adverse effects on empathy (164) and can sometimes lead to students dropping out of medical school (165). Burnout in doctors can affect doctors’ work satisfaction, the doctor-patient relationship and patient care (146).

2.6.2 Transition to Tertiary Education

There are many situational factors that conspire to create stress for young people entering higher education. These can be a move away from home, which may include loss of emotional and financial support, loss of longstanding friendships, a search for identity, and pressure from parental or increased self-expectations (147). There will also be the workload and the requirement for self-regulated work, which requires motivation and organisational
skills. By its very nature, self-directed learning requires intrinsic motivation, which is a quality that may be lacking or that may not yet be a familiar way of operating to some emerging adults.

There are some practical issues regarding the process of transition to University that could arise. If the young person has already experienced an episode of mental ill-health, then they may have existing established relationships with mental health clinicians and providers in their area. This could include the documentation of their past medical history including the success or otherwise of treatment, along with possible routes for prescription of medicine or a course of psychological therapy. Acceptance into tertiary education could involve moving to a different geographical area, and this could disrupt the established management. Liaison between the old and the new team has been seen as ‘essential’, with the UK College of Psychiatrists endorsing the role that some University staff adopt in easing this transition (4).

2.6.2.1 Transition to Medical School and Mental Ill-Health throughout the Medical Programme

The high prevalence of depression and anxiety in medical students raises important questions about why this might be the case. Smith’s study measuring depression and anxiety scores in medical students before they started their course, reported that students entering medical school had an emotional status similar to that in the general population (179). Quoting other studies that have recorded high rates of depression and anxiety in medical students once their training was underway, Smith et al suggested that it may then be the medical school curriculum that played an important role in the students’ development of anxiety and depression (179). Although Smith’s study had its strengths, for instance the sample contained
94.2% of the total number of entering students over three consecutive years, the conclusion may be overstated, as the study was not an efficacy study designed to show that the curriculum was the cause of the deterioration in mental health (3).

In exploring other possible explanations for this proposal of a deterioration in mental health after starting medical training, it is interesting to consider Zoccolillo’s study (25). This prospective study followed students for two years after they entered medical school, and found that the students who went on to develop depression already had higher rates of risk factors for depression at the time of their selection for the medical programme. A history of depression prior to medical school admission and a family history of treated depression were much more common in this group of students than in those that did not develop depression. Zoccolillo concluded that there was ‘a positive bias’ in the selection of medical students, meaning that those accepted into the medical school programme are more likely than other students to have a predisposition to depression, and that the high rate of depression in medical students could not solely be as a result of the medical school training (25). Exploring this hypothesis from a different perspective, Yates conducted a retrospective study identifying medical students who had experienced an episode of mental ill-health during the medical programme, and then examining their health records prior to admission to medical school (180). This study found that these students were more likely to have a history of previous episodes of mental ill-health than students who had remained well during the medical programme (180).

If the findings from the research above by Smith, Zoccolillo and Yates are correct, then it would seem that at the point of admission to medical school, prospective medical students’ mental health is on a par with the general population, but that the people who are
successfully selected into the medical programme, may be more likely to have a history of prior mental illness and may be more likely to become unwell in the future.

Several studies have been conducted examining the changes in medical students’ mental health throughout the medical programme. There is some debate in the literature about changing levels of mental health and wellbeing for students as they progress through medical school. A recent study from Australia found no significant differences when comparing distress levels between students in different medical school years (153). Some studies from medical schools have suggested an increase in distress as the programme progresses (181, 182), and although one of these studies only took measures of stress at two time-points (181), the other study did take five measurements over the six year programme (182), which would seem to provide evidence that the students at that school did become more stressed as they progressed through the medical programme. Wolff also makes the point that US medical students’ physical health may also deteriorate after they start medical school, and demonstrated that students exercised less and slept less after they started the programme (183).

Not all of the literature, however, supports the theory that medical students become progressively stressed as they move through their medical training. A study of medical students at a University in Pakistan found that the prevalence of anxiety and depression was significantly higher in students in Years 1 and 2 than in students in Years 3 and 4 (184). Similarly, Dyrbye studied ‘burnout’, depression and alcohol use in US medical students and found that at-risk alcohol use and the frequency of a positive depression screen decreased in more senior students, although the frequency of ‘burnout’ did increase (176).
Some studies have shown that in many cases, stress is linked to a specific phase of medical training, for instance to an increase in clinical responsibility in the third year, when the student has not had the time or maturity to develop a professional identity (185). This finding was supported by a large-scale survey conducted across 16 US medical schools that obtained data from students at three points in their training: during first year orientation, at the start of clinical training, and during the 4th year. The most stressful time was found to be during the transition to clinical rotation, with students reporting greater stress, more ‘bad mental health’ days and feelings of depression than in Year 1 (22). A Swedish study also found that Year 1 medical students reported a higher degree of pressure from studies compared with students in Years 3 and 6. However, Year 6 students gave a higher rating to working in a “non-supportive” climate (151). Similar observations were made in an Ethiopian study, which reported that younger students in pre-clinical years reported symptoms of clinical distress more often than senior students, but that stress levels rose again in the intern year (143).

It would seem that the literature does not currently point to one clear pattern of change in students’ mental health throughout medical school training. The candidate’s conclusion is that it is possible that students’ mental health across different years of training may be influenced by the particular medical school they attend. If this is the case, then it is likely that there would be different results from different countries, or even from different medical schools within the same country. A study that is designed to provide information about students’ mental health changes throughout the years in an individual medical school could be of interest to that medical school, as it would allow the medical programme directorate to reflect on programme-dependent factors that could be contributing to this.
2.6.3 Help-Seeking Behaviour in Tertiary Students

Help-seeking behaviour is an important factor in any discussion of student mental health, as it influences the likelihood of accessing treatment. Leahy’s Australian study of 955 tertiary students reported that 11% of them had been diagnosed or treated for mental ill-health (153). This study showed that psychology students were more likely to have received treatment for mental ill-health (24%), with lower rates for law students (12%), medical students (10%) and engineering students (6%). Also, the study reported that female students were more likely to have been treated than male students (14% versus 7%), and that domestic students were more likely to have been treated than international students (12% versus 6%). However this study did not provide any comparative data for peers in the general population.

Blanco however, did compare the help-seeking behaviour of students and ‘non-students’, and reported no significant differences between the two groups, with the exception that students with alcohol and drug disorders were less likely to be receiving treatment than those with similar disorders in the non-student group (154). This raises the possibility that help-seeking behaviour may be influenced by factors other than being a student. In terms of reflecting on this idea from an emerging adult theoretical viewpoint, one could propose that if a young person were still in the developmental phase of an emerging adult, then they may not have fully developed the ability to make independent decisions and to act responsibly, which could affect their help-seeking behaviour.

As mentioned above, several studies in the literature address the topic of barriers to help-seeking amongst tertiary students. These have been shown to include time constraints, stigma, concerns about privacy, scepticism about treatment effectiveness, lack of awareness
of services, insight, emotional management skills and previous personal experience of seeking help (139) (14).

2.6.3.1 Help-Seeking Behaviour in Medical Students

Medical students with depression are under-treated as they often do not seek help (186, 187). A UK study assessing medical students’ opinions on help-seeking, reported that stigma was a significant factor and that mental ill-health was perceived as a weakness that could have negative implications on a future career (187). Tija reported that American medical students with depression are under-treated, with only 26% of those with depression receiving treatment despite the availability of effective medications and confidential services (186). In one Californian study, where 24% of the medical students were depressed according to Beck Depression Inventory (BDI) criteria, only 22% of these students were using mental health counselling services. The reasons given for non-use of services were not enough time, stigma, expense, and fears of lack of confidentiality or documentation on academic record (138), which are similar to the reasons given by all tertiary students as stated above.

However, medical students’ perceptions about seeking help may also affect the way they treat patients, as well as influencing the management of their own health. Nuzzarello studied medical students’ help-seeking behaviour for depression and how this might affect their ability to detect depression in other people (188). Part of this study involved using a scenario about a member of the ‘general population’ and asking students to assess the person’s risk for depression along with suggestions for referral to a health professional. The study found that students with a personal experience of depression, or students who had a close friend who had been treated for depression, were more likely to suggest that the person in the scenario be
referred for treatment. Another interesting finding was that the students who over-diagnosed depression in the general population were the ones who were most likely to delay help-seeking when it came to their own mental health. Nuzzarello concluded that the overestimation of risk could cause increased anxiety and avoidance of seeking help (188).

Tyssen conducted a prospective cohort study in Norwegian medical students in order to study predictors for seeking help (189). This study started with students in their final year of medical school and followed the participants through until their 4th postgraduate year as doctors. The study found that although the prevalence of mental ill-health had increased throughout that time, there was no increase in help-seeking. Also a certain personality trait, ‘reality weakness’, was found to predict low help-seeking. This personality trait measures perceptions and feelings such as ‘living in a fog’ and not being in touch with reality. It appears that these medical professionals may be less likely to seek help when needed than others who do not have this trait.

In a recent review of 1328 medical students in Australia and New Zealand, 71% of the medical students surveyed were aware of support services at the University but only 49% had used them or knew someone who had (190). Seventy per cent of the total cohort had their own general practitioner (GP), but this dropped to 45% for international students. These findings make one wonder where a significant proportion of medical students do go for care when they become unwell. Results from a study of 4th year medical students in Auckland showed that while only 27.5% would seek help from a professional, 97.5% would confide in a peer (191). Whilst the idea of peer support will be explored later in this thesis, one of the other possibilities is self-treatment and treatment by colleagues. Hooper addressed these topics in a study with UK medical students in Years 2 and 4 (192). The study reported that in
the preceding year, 43% of the students had informally consulted doctors who were relatives or friends, with 13% of Year 4 students also receiving prescriptions from this source. The other study findings were that 9% of the medical students had ordered their own investigations, 25% had been examined by a colleague, and 32% of those who had seen a specialist, had self-referred. Over half of the students in the study felt that it was appropriate for doctors to self-investigate and self-refer (192).

Roberts investigated where medical students would prefer to go if they were to attend a health clinic in a survey of nine different medical schools in the US (193). The results showed that over half of the students stated a preference for having a healthcare provider who was outside the institution, but that 90% of the students said that they would only select this option if it were covered by their insurance, suggesting that financial constraints influence where medical students seek help. The sample used in this study adds to the strength of the evidence, as the study was conducted with students from nine different medical schools rather than a single institution (193).

2.6.4 Causes of Mental Ill-Health in Tertiary Students

The issue of poor help-seeking behaviour, under-recognition and under-treatment of mental ill-health has been addressed previously, but the candidate feels it is important to mention it again at the start of this section to emphasise that it is at the core of the problem of poor student mental health. In terms of other causes of mental ill-health in students, multiple stressors have been identified such as academic demands, financial stress and family and interpersonal stressors (194). International students may also be exposed to additional stresses that can have an impact on their mental health and wellbeing. These may include
adjusting to a new cultural and academic environment, distance from family, financial issues, language difficulties impacting on academic prowess and family and self-expectations (29).

Several studies have examined the impact of personality traits on students’ mental health. The trait of perfectionism has been shown to be linked to higher levels of self-reported psychological stress, and to be a predictor for a higher likelihood of future mental ill-health (139, 195). If feelings of loneliness are added to the perfectionism, this has also been shown to increase the likelihood of having symptoms of depression and anxiety (195). ‘Shyness’ has also been shown to be a predictor for mood disorders as well as substance abuse (195). Tosevski highlights the fact that a student’s personality can influence their academic achievement and states that “there may be a mismatch between personality and career choice” (158).

In terms of identifying students most at risk, some research has been conducted to identify which disorders may be linked to suicide. Personality traits and behaviour such as introversion and loneliness were found to be associated with a higher risk of suicide (158). Similarly at higher risk were those students who had problems with academic life, family relationships and with expressing anger. However, although these conditions and traits have been shown to be associated with higher risk of suicide, they cannot be said to be causal. However, these traits could still be used as ‘indicators’ or ‘flags’ for increased risk.

In recent years, there has been some interest in the concept of ‘academic entitlement’, whereby students have an expectation of academic success, but externalise the responsibility for achieving that success (196). Chowning and Campbell, who have developed and validated an academic entitlement tool, state that students, who have an external locus of
control, may attribute it to ‘bad luck’ or due to an external cause if they do not perform well. The authors suggest that this could be a strategy to protect self-worth. They also comment that such students report a higher degree of academic stress than students who have an internal locus of control (196).

Financial stress has been shown in the research to be linked to mental ill-health in the tertiary student population (4). Some studies have found that financial difficulties seem to increase depression, anxiety and stress levels in students (197), whereas in other studies it was the act of worrying about money that was linked to mental ill-health, rather than the actual debt levels.

The majority of the research into the causes of student mental ill-health has focussed on the possible risk-factors. However, there have been studies that have also examined possible protective factors for students’ mental health. Margitics identified several factors that were shown to be protective in the development of depression in students (127). The protective factors were peer support, acceptance by others and parental care. Williams also investigated this issue with students, and discovered that spirituality had a negative correlation with feelings of hopelessness (198). This is an important finding as hopelessness is a known risk factor for suicide (158). Tosevski also highlights the importance of thinking styles and the way that they can contribute positively to psychosocial development, including the development of a sense of purpose (158). The opposite of this has also been shown to be true in that psychological distress has been linked to negative thinking patterns such as poor coping self-efficacy and perfectionism.
2.6.4.1 Causes of Mental Ill-Health in Medical Students

With regard to mental ill-health in medical students, part of the discussion is why some students are at higher risk than others and what determines this. It is clear that some individuals are more susceptible to becoming mentally unwell than others (167, 182). One longitudinal study followed first year medical students for eight months and found that the numbers of students reporting depression doubled over this time period (167). The authors found that the students who reported higher levels of psychological distress at the start of the study were also likely to have higher levels of stress eight months later. The students with the higher scores for distress also scored more highly on suppressed anger and Type A personality behaviour (167). It is likely that this is partially dictated by their individual resilience threshold and their stress vulnerability (78). The stress–vulnerability model has been mentioned earlier in the thesis, but it will be examined in a little more detail here as it demonstrates that there are several interplaying factors that will influence the way that a person will respond to stress. These are their baseline level of ambient stress, superimposed peaks of stress and the level of the resilience threshold in that individual. The level of the resilience threshold is determined by a range of factors: biological, psychological and social. For instance, a baby born to a mother who has post-natal depression may have a higher susceptibility to stress-related illness later in life. This is thought to be due to the changes in the hypothalamic-pituitary axis in the developing brain (199).

Three specific traits have been shown to be predictors of future stress in medical students: high levels of neuroticism, high levels of conscientiousness and low levels of extraversion (68). These findings support earlier work that found that perfectionism and neuroticism are
risk factors for mental ill-health in medical students (26). These studies were rigorously
designed and this evidence appears to be strong.

There are many international studies that have surveyed medical students about what they
perceive as the stressors at medical school. Students have identified stressors such as the
effects of medical school on the student’s personal life, talking to psychiatric patients,
presenting cases, dealing with death and suffering and relationships with consultants (160). Concerns about the workload, progress, aptitude and assessment are common (197, 200-202).
The literature appears clear that the stressful incidents that the students experience are related
to medical training rather than to personal problems (23)(152).

Common risk factors for mental ill-health in medical students that have been identified are a family history of depression and anxiety, and a major recent negative life event such as losing a relative in the last year (203, 204). The number of negative personal life events that had occurred in the previous 12 months was also the strongest predictor of burnout (176).

Other studies in medical student populations have identified a possible association between depression and a decreased ferritin level (205), a seasonal mood variation with more depression in colder months (206), higher rates of anxiety and depression in medical students living in University dormitories rather than at home (204), higher levels of emotional distress from those students who are not in a ‘love relationship’(144), and significantly higher levels of depression in students who smoke when compared to non-smoking students (207). One study reported that a low maternal socioeconomic status was associated negatively with medical students’ self-reported stress levels, mental disturbances, attitude towards life, personality and professionalism (208).
As well as looking at mental ill-health, some studies have focussed on positive aspects of mental health and wellbeing. Parkerson measured the health status and life satisfaction of medical students at the beginning and the end of the first year of medical school (209). Both health and satisfaction worsened throughout the year, with the biggest change being in depressive symptoms. The measures of satisfaction had a negative correlation with symptoms of depression and anxiety. The students who had higher levels of satisfaction had fewer symptoms of depression and anxiety, higher self-esteem, a greater amount of sleep and fewer stressful life events. These students also did more physical activity and had better physical health. The factor most positively related to better health and life satisfaction was strong social ties (209). Other studies have reported the importance of physical exercise as a preventative mechanism for depression (210), the benefits of educating students about well spent leisure time as a stress-management strategy (123), and the fact that the maintenance of strong social ties are a protective factor for depression (211).

The existence and type of coping mechanisms can also influence predisposition to mental distress and depression. One study found that medical students identified feelings of helplessness and an inability to cope as common stressors (202). Medical students who used ‘engagement strategies’ had fewer depressive symptoms; whereas students using ‘disengagement strategies’ had higher levels of depressive symptoms (212). A specific type of coping mechanism entitled ‘wishful thinking’ has been shown to be associated with an increased risk of depression (135). Wishful thinking is an avoidant coping mechanism that is passive, for example wishing that something would happen to change things. The authors argue that the importance of this finding is that it may be possible to teach more helpful thinking patterns and coping strategies.
Dyrbye’s large systematic review of mental health in US and Canadian medical students reported that there was insufficient data to draw any conclusions about the causes or consequences of the high level of distress in medical students (21). In relation to burnout however, she concluded that the strongest relationship to the risk of developing burnout was the number of negative personal life events that had occurred in the previous 12 months. Dyrbye also suggested that both personal and curricular issues are related to burnout (165, 170).

A Chilean study that collected data from 144 medical students in Year 5 published in 2003, found that 91.7% of students described receiving at least one form of abuse whilst at medical school (56). The abuse was classified as verbal (85.4%) such as being addressed in a way that was humiliating or shouted at, psychological (79.9%), physical (23.6%), such as being physically threatened, pushed or having things thrown at them, and sexual (26.4%). Teachers were cited as the main source of verbal and emotional abuse and other students as the main source of physical abuse. Sexual abuse, such as being subjected to unwanted sexual advances or touching was perpetrated by teachers and peers at a similar rate. The students stated that abuse at medical school did affect their wellbeing, leading to lack of motivation, fear and uncertainty, and that 17% of them had considered leaving medical school because of it. Other articles have supported this finding of abuse of medical students (55, 213). Indeed, one ethnographic study of a British medical school revealed that intimidation was accepted as part of the culture of medical school and that many staff felt that it served a function by motivating students to learn, protecting patients and preparing students for a demanding working life (213).
2.6.5 Consequences of Mental Ill-Health in Tertiary Students

There are many implications of students with untreated mental ill-health. The literature reports consequences such as poor grades and class attendance, decreased emotional and behavioural skills, social isolation, substance abuse, accommodation problems and inadequate finances (14, 139). Students with emotional distress are less likely to attend class or continue with their courses (14, 154).

Students who have mental ill-health have also stated that the stigma associated with their state of health caused a sense of social isolation (14). As has been already stated in this literature review, low social contact is a risk factor for depression. Therefore this could create a vicious circle. Helen Stallman studied the relationship between students’ psychological health and their Grade Point Average (GPA) (156) She highlights the fact that if a student is not feeling mentally well then they may be unable to study on that day, but they may then try to cram their studying into the few days that they are feeling well, which puts them under more pressure. This may affect their GPA, which in turn may affect how they feel and increase their risk of another episode of mental ill-health.

At the extreme end of the spectrum of consequences of student mental ill-health are self-harm and harm of others. One study, which surveyed 10904 US students, reported that 4.3% of students carried a loaded gun to school (214). Campus shootings can have lasting effects on other students at the institution. A cross-sectional survey of 4639 students at a Virginian technical institution, where 32 students were killed in one such violent incident, showed that 3 to 4 months later, 15.4% of them were suffering from high levels of post traumatic stress symptoms (215). This reminds the candidate of the significance of the environment, as it is
possible that it may not just be those who witnessed the incident who are affected, but that such a violent incident could have an impact of the wider ‘mood’ of the institution.

2.6.5.1 Consequences of Mental Ill-Health in Medical Students

The fact that medical students have higher rates of stress, depression and anxiety than the general population, and often do not seek help or treatment when they require it, can have negative consequences both for the students and for their future patients. Personal consequences of emotional distress in medical students can manifest as substance abuse, broken relationships, suicide, and attrition from the profession. Rates of burnout have been recorded in 45% of medical students in their final year (176). Dyrbye’s systematic review of mental health of students also found that there are consequences for the profession as well as for the individual (216). The author comments that students can become cynical, and this can affect their care of patients. Interestingly, cynicism is one of the components that is measured as part of the construct of burnout, the other two being emotional exhaustion and a reduced feeling of personal accomplishment (173). A study of at-risk behaviours and healthy behaviours in medical students and residents concluded that medical school training may actually prevent students from engaging in healthy behaviours, as by the time they are doctors they sleep less, exercise less and spend less time in activities outside of medical school than when they started their training (72). The authors also hypothesise that if doctors do not engage in these behaviours themselves then they are less likely to encourage such behaviour in their patients. This view is supported by evidence from McKenna et al who showed that doctors who exercised themselves were three times as likely to advise their patients to exercise (217). Several studies by Frank et al, also showed that the way doctors look after themselves affected the way they look after their patients with respect to 14
different health behaviours (36, 218). A summary of the literature of mental ill-health in doctors is beyond the scope of this thesis. However, clearly it is relevant to look briefly at this topic when discussing the consequences of mental ill-health in medical students. If a student qualifies and they have not built up their resiliency skills or improved their help-seeking behaviour during their time at medical school, then they will continue to be at risk when they are practising as a doctor and this may impact on patients. Firth-Cozens reviewed the literature regarding the impact of doctors not seeking help, and listed selective attention along with memory and concentration deficits as some of the possible consequences, concluding that poor help-seeking behaviour was a likely cause of work-place accidents (219). This view is supported by research showing that depressed doctors have been shown to make six times as many medication errors as those who are not depressed (34).

2.7 Improving Mental Health and Wellbeing in Tertiary Students

2.7.1 Recommendations for Improving the Mental Health and Wellbeing of Tertiary Students

There is a recommendation from The Royal College of Psychiatrists in London, that all tertiary institutions should have a formal mental health policy that comes under the disability legislation (4). This UK recommendation is supported by guidelines from Australia, with both these documents suggesting that if a University has a duty of care towards its students, then such a policy could be viewed as an ethical obligation, rather than an optional extra (4, 220). In contrast, Eckersley argues that looking after the mental health and wellbeing of a young person could be seen as the responsibility of society, employers or parents (64). The candidate proposes that both these views have worth, and that one defined entity need not
assume full responsibility for the health of young people. There is also an argument that there is a further incentive for Universities to adopt policies that enhance wellbeing, in that academic success must be based on a foundation of good mental health (139).

The Australian ‘Guidelines for Tertiary Education Institutions to facilitate improved educational outcomes for students with a mental illness’ were developed in order to summarise the evidence in this area, and to enable the translation of evidence into practice by outlining policy suggestions that could be adopted by their institutions (220). These guidelines were developed using the Delphi method, whereby a panel of experts is used to provide a consensus, in the absence of formal evidence (221). The Australian researchers included student consumers on the panel, alongside mental health professionals, thereby incorporating the principles of student empowerment into the methodology (39). These Australian guidelines will be now summarised in some detail, for as well as having been devised using an empowerment philosophy, they are at the forefront of work in this area in Australia and are very relevant to a New Zealand context.

The Australian ‘Guidelines for Tertiary Institutions’ outline a strategic approach aimed at enhancing the mental health of tertiary students, which is supported by a body of research (14, 15, 222). These guidelines work at a variety of levels and suggest that institutions develop policies and initiatives that cover the whole spectrum from mental health promotion for all students, through to crisis management for students who are very unwell. The document emphasises the importance of all stakeholders being involved in the development of institutional guidelines, including students who have experienced mental ill-health. This ties in with recommendations from the Youth Development Strategy Aotearoa, which also
stresses the importance of involving young people in a meaningful way during the development and delivery of youth health initiatives (59).

The Australian guidelines recommend that the institution streamlines communication and collaboration within the organisation itself, as well as establishing relationships with external mental health providers (220). The development and maintenance of links with the world beyond the institution is seen as fundamental, and some organisations have been acting on this advice (17). One example of a University effectively establishing its own links with an outside service is from the UK, where a tertiary institution and a local hospital team created a fast-track pathway. This pathway, ‘Early Intervention for Psychosis’, enabled students who were acutely unwell to be quickly admitted to hospital (4). The literature in this area mainly focuses on the pros and cons of new services and external links for students (14, 193, 222). In Storrie’s systematic review of students with mental health problems, she also makes the point that using external providers may not always be in the students’ best interests if communication between the external provider and the University is poor (14). Alongside this debate about the impact on students, the candidate believes creating networks and sustaining relationships with providers of relevant services may also have benefits for the tertiary institution. Such an on-going relationship may serve to keep the institution up-to-date with national mental health initiatives and create opportunities to pool funding to develop new resources. Both of these developments could create a platform for future collaborative research projects between the tertiary institution and the external agency. The Australian Guidelines for Tertiary Institutions also consider internal communication within the organisation at several levels (220). They suggest that improvements could be made at the service level, for instance between Disability Services and Counselling Services, as well as at
the grass-roots level, for example by creating policies regarding the distribution of mental health information to students.

Many relevant practical issues pertinent to the implementation and maintenance of mental health initiatives are highlighted in the Australian guidelines. For example, the importance of suitable geographical placement of support services, confidentiality regarding students’ personal health-information, and funding and accountability for the provision of services. Clear time-frames and evaluation processes of new and established mental health initiatives are also suggested. Issues specific to staff and to students are summarised. Key points in the guidelines with regard to staff are the importance of training in mental health to increase identification of students at risk and knowledge of appropriate early intervention, staff awareness of local resources, networking, and access to an advisor who has expertise in mental health. For students, the guidelines suggest peer support in terms of peer-identification of mental ill-health, and appropriate action. Furthermore they outline students’ rights, which include the right to access culturally appropriate care, and the right to receive ‘reasonable adjustments’ for course work when unwell.

Storrie’s systematic review of interventions to improve the mental health of tertiary students concluded that there were several concepts that must be addressed to increase the likelihood of successful outcomes (14). One could view these perhaps as some of the fundamental elements required to create a supporting framework for interventions in a student population. Governance was one of these essential elements. Maximising the awareness of services, both for staff and students, was another important concept. The remaining elements in this framework were education and information-sharing. Storrie’s systematic review also stressed that some research had been undertaken into the way that staff members managed situations...
with students who were psychologically unwell. This research emphasised the importance of training staff members to assist students with emotional problems in a helpful way, rather than labelling such problems as behavioural. Although Storrie’s systematic review serves as a useful summary of the literature, it does have some limitations. The terms used for the search were quite narrow, and although 572 articles were initially retrieved, only 18 of these were considered eligible for inclusion, with the inclusion criteria not being clearly stated. Therefore it is possible that other articles containing useful information regarding causes and interventions may have been excluded from this review.

2.7.2 Interventions for Improving Mental Health and Wellbeing in Tertiary Students

There is evidence to suggest that the cost-benefit ratio in terms of improving mental health in young adults is at its most effective at the beginning of the slide towards ill health, when problems start to occur (223, 224). In other words health promotion, prevention and early intervention could be the key to improving mental health and wellbeing (225, 226). In the tertiary student group, there is clear evidence about the effectiveness of interventions to prevent alcohol abuse, but less evidence for the effectiveness of intervening early in depression and anxiety (15). In terms of focussing on specific interventions for tertiary students, this section of the chapter will firstly examine interventions that are aimed at all students at the preventative end of the spectrum, and will then move on to comment on interventions targeted at individuals who are unwell.

2.7.2.1 Interventions for All Students

One of the key messages that could come under the banner of mental health promotion is the importance of healthy lifestyles for all students. There is clear evidence that highlights the
significance of exercise, sleep and eating patterns for staying mentally healthy and alert (227-229). Types of meditation, including mindfulness meditation have been shown to reduce stress and enhance wellbeing in multiple studies (230-232).

The design of curricula and academic support services can play a role in enhancing student wellbeing and lessening distress. For instance specific stressors such as Monday morning examinations, which have been highlighted in the literature as being a source of stress for students, could be minimised or avoided (158). Student education programmes have been put in place in some Universities, teaching topics such as reducing alcohol and drug misuse, helpful coping strategies, mental health screening and skills such as cognitive-behavioural techniques and relaxation (233). The development of personal skills such as self-esteem and emotional expression could be included as part of a package of student skills to enhance wellbeing (234). The evidence shows that it could also be useful to explore interventions to recognise and work with perfectionism (195). Part of equipping students with skills and resources to enable them to enhance their wellbeing involves the provision of resources (14, 59). Guided access to self-help resources for all students is recommended (235-237). One example of this is ‘The Desk’, which is sponsored by the ‘beyondblue’, the National Depression Initiative in Australia (141). ‘The Desk’ is an on-line tool used by many Australian Tertiary Institutions that has resilience-building modules as well as an on-line coffee house, where students can communicate with peers. It is interesting that part of this website invites students to communicate with others. A lack of social support has been linked to the onset and relapse of depression, with the recent UK College of Psychiatry report citing this as multiplying the risk by a factor of six (238). Conversely, the inverse of this is also true
in that the presence of social support has been linked to the development of resilience and stress-resistance (69).

The importance of connection, meaning and contribution have repeatedly emerged in the literature as making a vital contribution to the maintenance of positive mental health in this age group. In young people, “religiosity” has been shown to be a suicide protective factor (239). However some recent research has shown some new findings in terms of religious beliefs and mental health and addictions. A study in college students showed that ‘problematic attachment to God’ was linked with negative health outcomes amongst men (240). This study showed that ‘anxious attachment’ to God was associated with increased risk of marijuana use and that ‘avoidant and anxious attachment’ to God were both associated with higher levels of drinking. Nevertheless, having “a meaning in life” and paying attention to one’s non-professional life has been reported to have protective effects against burnout (241). In the same vein, it is interesting to note that the factor that had the largest impact on student retention was a ‘feeling of belonging’ (242). Levels of feelings ‘connected’ to the institution have also been shown to be protective against distress with higher levels of distress amongst students who feel less connected.

In view of the importance of establishing healthy connections with others, it is not surprising that some research has been undertaken to assess the value of mentoring. A study with senior nursing students as mentors claimed that this mentoring programme positively influenced the scores of ‘internal locus of control’ for incoming nursing students (243). However this study used only post-intervention measures and had no control group, so there could have been other factors which influenced the students’ scores over the thirteen-week time period. Mentoring plays a major role in business, education and healthcare (244). The core concept
behind the theory of mentoring is that of the relationship between mentor and mentee. One definition of mentoring is ‘guiding the development of another person’ (245). In exploring and defining a theoretical vision for mentoring, Carroll proposed that the basis for this relationship could be viewed as that of a ‘human becoming’ (246). Although there is a need to further examine the conceptual framework behind mentoring, models have been defined that can serve as an underlying framework to support research in this area (247).

Interventions and education placed under the banner of mental health promotion that are for all students rather than for those who are unwell, strengthen the message that good mental health and wellbeing is a mainstream social issue (248). This sort of approach can help to build a positive wellbeing culture and may help to counteract the stigma that can so often act as a barrier to help-seeking (187). Anonymous web-based support services may enable help-seeking and can be used to provide information about wellbeing and on-line interventions (237). Alongside the introduction of health promotion initiatives at Universities, it may also serve to be wary of promoting mixed messages. For instance there may be widely-advertised campus activities that promote alcohol abuse, which would not be in keeping with wellbeing messages being promoted (4).

2.7.2.2 Interventions for Students with Mental Ill-Health

It appears from reviewing the evidence, that initiatives to enhance help-seeking behaviour can be useful. Once a student has taken the step of contacting a professional service for mental ill-health, they are more likely to do so again in the future should the need arise (249). This stresses the importance of enabling students to access help when they first need it. Tertiary education staff needs to be familiar with local health services, so that they can
appropriately refer a student if required (14). Some of the literature highlights the possible challenges regarding liaison between health staff and education staff with regard to a student who is unwell, in that these staff may each have different roles and goals. It also signals the limitations that confidentiality may place on a potentially collaborative approach between staff from these services (4, 14).

Hunt et al give examples of recent promising initiatives trialled in the US, which include a web-based intervention to increase help-seeking behaviour, and a collaboration between US campuses to deliver screening, early intervention and treatment for depression (139). Hunt’s review however states that robust evidence of the effectiveness of policies and programmes is lacking, and calls for controlled comparison studies within and across institutions. One example of these promising initiatives was the NAMI (National Alliance On Mental Illness) implemented within more than 1000 educational institutions, including some Universities throughout Pennsylvania (233).

The purpose of these programmes has been “to improve the quality of life for all people affected by mental illness”, which they do by providing advocacy, education and support. There is a peer support element to NAMI programmes as students are encouraged to be peer leaders and run NAMI groups, as well as educating other students and identifying those at risk. Suicide prevention initiatives are also in place at some tertiary institutions (233). These initiatives may involve running training programmes for ‘gatekeepers’, in other words leaders and advisors who may be in a role where they can identify and assist students at risk (233, 250-252). Other programmes focus on developing and maintaining an inclusive social environment for those who are unwell, or look at how to address the needs of particular groups of students who may be at higher risk, for instance international students (147). Some
of the research explores interventions that can are targeted at individual students who are unwell or who are at increased risk of mental ill-health (253, 254).

These sorts of institutional policies may serve to reduce stigma and exclusion, and assist with early identification and management of those who are unwell. Alongside this, there is a need for policies that focus on the potential risk that unwell students may pose to other students, as the safety of all students in the institution is of paramount importance. Disciplinary Services can sometimes play a role in the management of a student who is unwell, as the mental ill-health of the student could have an impact on their behaviour, resulting in disciplinary action. If a tertiary institution compels a student to take a leave of absence from their studies, there is some discussion about the appropriateness of making this ‘medical leave’ rather than ‘disciplinary leave’. This would still have the desired action of removing the student from the premises, but would also enable a more supportive and less punitive approach to be taken to the ‘removed’ student, by recognising that they are unwell, and that this may affect their present and future behaviour.

As well as the management of mental ill-health, and the assessment and minimisation of risk to others on campus, there is also a need for the provision of academic support for students who are unwell. Many mental health conditions, such as depression and anxiety, can affect concentration, making it difficult, if not impossible, to learn (115). In the UK, some tertiary institutions have employed mental health advisors in a role that involves assisting students with mental ill-health to attain their academic requirements. This can involve assessing how a student’s ill-health is affecting their learning and assisting by providing them with appropriately tailored strategies (4).
2.7.2.3 Interventions for Medical Students

In comparison with the general population, medical professionals are at increased risk of suicide. In the US, male doctors have a mildly increased risk of suicide compared to men in general, and women doctors have an elevated risk compared to women in general (255). A consensus statement was published in JAMA in 2003 that called for a change in approach to depression and stress in the medical profession, including a change in attitudes towards doctors needing help, the development of the support systems and removal of barriers to help, both for doctors and for medical students (8). Research has shown that depression and work stress in doctors is in part influenced by dispositional factors and experiences during medical training, and interventions targeted throughout medical training have been advised (159). The time to commence development of coping skills and support systems and networks is during the medical training period.

Early interventions can be effective. Medical students using stress-management programmes have been shown to have less depression and anxiety and more positive coping skills (177, 256). For instance, a self-hypnosis intervention was shown to be effective in medical students to relieve symptoms of psychological distress and depression (257). Such programmes have also shown a sustained effect such as a reduction in anxiety in a stress-management intervention group three months after the course ended (258).

Due to the evidence that female medical students have been shown to be at a higher risk of becoming psychologically distressed (21), one medical school ran support groups for female first year students (259). These groups were facilitated by women faculty leaders, and the medical students chose topics to discuss that had a focus on support and self-development.
Although this intervention was positively evaluated by the participants at the end of the year, the study was not designed to produce evidence of the effectiveness of the intervention in terms of improving the mental health of participants. In 2010, a study did evaluate the effectiveness of a self-development group for medical students (260). This study also had a control ‘discussion’ group, and the results showed a significant reduction in stress at three months in the intervention group, with no difference between the male and female medical students.

A review of stress-management programmes in medical schools by Shapiro in 2000 found 24 studies designed to measure the effectiveness of such interventions (177). However, only six of the studies used a robust research design, as many studies lacked controls or validated measures. Nevertheless the authors concluded that stress-management interventions were effective in medical students, and had been shown to reduce depression and anxiety, improve immune function, increase spirituality and empathy, resolve role conflicts, improve coping mechanisms and increase knowledge about stress. However, they stated that it was unclear what the successful components of the programmes were, whether they were best delivered to individual or groups, and what duration and frequency of input was most effective.

There has been some interest in mentoring programmes in medical schools. One review of mentoring support programmes in medical students highlighted the need for more structured and formal programmes (261). Another review of mentoring programmes for medical students aimed to summarize the objectives and effects of such programs (262). This review included mentoring programmes that supported the professional and personal development of the student with the mentor being an experienced medical professional. Most of the twenty-five studies included in the review assessed programmes with a focus on the provision of
career counselling, although a few of the mentoring programmes aimed to develop professionalism and personal growth. In terms of the effects on student wellbeing, five of the mentoring programmes analysed in the review stated that the students included in the programme rated their overall wellbeing as higher. A point of interest from this review was that one of the recommendations for future mentoring programmes was that they could adopt a ‘tiered structure’ whereby junior students are mentored by more senior students, who in turn are mentored by staff members. This system is similar to the pyramidal structure of peer support programmes, which will be addressed later in the thesis.

Programmes have been developed for medical students that promote social networking (263). This is in keeping with findings from a study by Lee et al who used qualitative methodology to assess the essays of 60 students enrolled in a wellness elective which highlighted the importance of maintaining networks (69). However, Lee cautioned that social support could be a ‘double-edged sword’, stating that as well as providing support it can also place demands on students’ time and energy.

Several studies have contained evaluations of educational wellbeing programmes for medical students, some of which have been part of the curriculum (231). The ‘Health Enhancement Programme’ (HEP) forms part of the curriculum at Monash medical school and is an experiential programme taught in small groups (231). The HEP content includes stress-management, mindfulness and lifestyle topics (Education, Stress Management, Spirituality, Exercise, Nutrition, Connectedness, and Environment). Although this study did not use a control group, the effectiveness of the HEP was evaluated in a pre-post study, which showed that it improved student wellbeing, even when the final measures were collected in a pre-exam period.
Lee, in another study, used qualitative analysis to assess the essays of the sixty US medical student who had enrolled in a wellness elective (197). The results from this study showed that the participants felt that talking to peers was a useful coping mechanism that normalised and validated their concerns, and that a wellbeing course enabled them to participate in self-care activities without feeling guilty. The course also enabled the participants to realise that wellbeing issues were important for doctors. The methodology of this study involved seeking feedback from the participants regarding the themes that emerged from the qualitative analysis, and this feedback validated and supported the thematic findings. However this participant feedback was sought up to two years after the course had been completed. Also the research was carried out with a group of self-selected students who had elected to take the wellness elective, and so therefore the results may not be generalisable to a whole medical student class.

One study reported data from a suicide prevention programme that involved screening and education, and aimed to increase awareness of depression and de-stigmatise help-seeking (264). An interesting feature of this programme was that it was targeted at both doctors and medical students. The candidate supports the logic of targeting a ‘de-stigmatising programme’ at faculty members as well as students, as it is possible that this could be a way of influencing the wider medical culture. The study results showed that of the people who were referred for treatment, 71% of them stated they would not have sought help were it not for the support and feedback provided through the education and screening components of the programme. Moutier also commented on the difficulty of measuring the effectiveness of programmes aimed at the prevention of suicide.
2.7.2.4 Summary of Literature Review

This chapter has revised literature covering key concepts in mental ill-health in the general population, in young people, in the tertiary student population, and in medical students in particular. The literature in this area consists of many cross-sectional studies to assess prevalence, only some of which use a comparator and a large number of qualitative or self-report evaluations of wellness initiatives in students. There are some longitudinal cohort studies which provide helpful information about possible predictors of mental ill-health and help-seeking behaviour. There have been intervention studies and systematic reviews conducted in this area which have provided evidence for effective interventions, but there is a need for further robust research in this area. The candidate’s three studies and systematic review will add to the evidence in this field.

A key point to highlight from the literature review is the importance of tertiary institutions developing and improving policies and services to enhance student mental health and wellbeing. The review also brought to light the significance of focusing on health promotion for all students, alongside early interventions for individuals who are unwell. Tertiary students appear to have worsening mental health, and internationally, medical students appear to be a high risk group. Taking into account fears about being identified, labelled, and discriminated against in addition to the current reluctance of medical students to talk to mental health professionals, it would seem logical to empower students to seek help by providing some type of psychological assistance that could be accessed anonymously. The next chapter will describe the development, feasibility, acceptability and use, of a self-care web-based resource to improve mental health and wellbeing in medical students.
3 The CALM Study

“...high levels of stress and low levels of motivation, confidence and self-esteem are rife among medical students, and I was no exception. Coming into my second year I found myself wondering whether I wanted to pursue medicine as a career, while being very interested in engineering, physics, maths and teaching. As a result, many of my experiences were tempered by this uncertainty, and I found it difficult to motivate myself to commit fully to my studies, and began to feel detached and lost…”

Third year medical student student (reflective diary entry)

3.1 Introduction

The literature review in the previous chapter highlighted the paucity of evidence regarding the prevalence of mental ill-health in New Zealand medical students. It also emphasised that students are a high risk group of young people who, even when they have a mental health issue, are reluctant to use available mental health services. Easily accessible online self-care resources may be an acceptable and useful adjunct to traditional mental health services for students. This current chapter describes the CALM study including the development of a web-based self-care resource (CALM: Computer Assisted Learning for the Mind) and its use and acceptability amongst 2nd and 3rd year medical students at one New Zealand medical school. The CALM study also estimates the prevalence of depression and anxiety within this group and within students who used the web-based self-care resource.
3.2 Background

It is clear that despite the existence of effective interventions, medical students often do not seek professional help, even when they are unwell (138, 186, 191). Reasons given for this are the lack of time, cost and concerns about confidentiality and stigma: a perception that they will be labelled ‘weak’ or that it may affect their future career plans (17, 138, 187). All of these barriers can be addressed with an anonymous electronic service, which appears to be acceptable to students (237, 265-267). Amongst the general population, there is evidence that internet-based self-help treatments using cognitive behavioural therapy can be effective for panic disorder (268) and mild to moderate depression (269, 270), and internet-based psychological interventions have been shown to aid smoking cessation (271) and to improve other conditions such as post-traumatic stress disorder (271) and even tinnitus (272). However, adherence to web-based interventions is low, and there is a need for shorter computerized interventions, or ways of providing brief electronic information to promote help-seeking (269). There is also limited knowledge about the mental health of those who choose to access computer-assisted care, in comparison with those who do not, as most studies only collect data about user profiles (273). Such research is important to indicate if those who are in most in need are accessing available mental health resources. A systematic review that appraised the evidence for the effectiveness of internet support groups in reducing depressive symptoms concluded that much of the research that has been done in the area is of poor quality (274). In this review, out of the 28 trials with depression, only 16 either used a single-component intervention with the internet support group as the only intervention or had a multiple component intervention with a control group that controlled for those other components. The review included 9 randomised controlled trials, but 6 of
these did not follow or describe an adequate randomisation procedure and out of the 23 before-after, controlled and randomised controlled trials, only 3 of them used an ‘intention-to-treat’ design (274).

Medical students are at risk of developing mental ill-health (21, 22, 29, 275). It has been stated that in terms of enhancing psychological health and aiming to prevent burnout, medical schools could respond by providing a confidential resource for treatment of depression, informing students about stressors, enabling them to have access to resources and equipping them with self-care strategies and skills (176). The CALM website made evidence-based skill-based interventions accessible to students while ensuring anonymity in this vulnerable population who are known to be resistant to help seeking (187). Its subsequent evaluation creates the foundation of the following research.

3.3 CALM Study Methods

3.3.1 Aims

The aims of the study were to develop and assess the use and acceptability of a mental health self-help web-based intervention, Computer Assisted Learning for the Mind (CALM) amongst 2nd and 3rd year medical students at one medical school over a 12-week period, and to estimate the prevalence of depression and anxiety in the study population. In terms of assessing the website use, the study also aimed to compare the characteristics of those who accessed the website, with those who did not.
3.3.2 Research Questions

- What is the use and acceptability of a self-care website to improve mental health and quality of life in a population of New Zealand medical students?

- What is the prevalence of depression and anxiety in a sample of New Zealand medical students?

3.3.3 Study Design

A before-after intervention study that also assessed website utilization patterns was conducted to identify the number and proportion of medical students who accessed the web-based CALM site and to compare the characteristics of those who used the website with those who did not. The study used mixed methods and employed quantitative and qualitative methods of analysis. Outcome measures included depression (PHQ-9) (103) and anxiety (GAD-7) (95) scores, recorded at baseline in class, online during the 5-week website trial and at 12-week follow-up in class. Results were linked by anonymous unique identifiers. Sub-sites visited were monitored and acceptability of use was assessed, using qualitative analysis.

When comparing the characteristics of those who used the website with those who did not, the demographics of those who chose to access the website were compared with the demographics of the whole class, as recorded on the year 2 and 3 class roles.

3.3.4 Study Population

All 2nd and 3rd year medical students in the 6 year undergraduate programme at The University of Auckland in 2008 were invited to participate in the study. The 2nd year medical students were pre-clinical and the 3rd year medical students had minimal clinical
experience. No students were excluded. Participation was voluntary and informed consent was obtained verbally.

3.3.5 Participant Recruitment

Two brief presentations about the CALM study were given in lectures for students in years 2 and 3, and all students were invited to participate in the study (Appendices 2 and 3).

3.3.6 Outcome Measures

Outcomes were assessed at baseline during the term and at 12 weeks just prior to exams (Appendix 4). Outcomes were also assessed upon accessing the CALM website during the study. Study outcomes included:

1. Proportion of the medical students who accessed the web-site

2. Depression (PHQ-9) (103) and anxiety (GAD-7) (95) mean score and proportion with significant impairment (scores ≥ 10) of those accessing the website compared with those not accessing the website, and over time

3. Web pages visited

4. Acceptability of the web-site and barriers to use

Thematic analysis was used to analyse responses from an open-ended question administered at follow-up to assess acceptability and barriers to use (276).

3.3.7 Instruments Used

The PHQ-9 is the self-report depression module taken from the PRIME-MD diagnostic instrument for common mental disorders (87). There have been validation studies of the
PHQ-9 conducted in a variety of populations (277, 278) including the general population (279) and university students (279, 280). The diagnostic validity of the PHQ-9 has been confirmed both in primary care and in outpatient clinics (89, 103, 281). One of these studies validated the PHQ-9 against clinical interview by a mental health professional for accuracy in diagnosing major depression. Using the interview as the criterion standard, the PHQ-9 was shown to have a specificity of 88% and a sensitivity of 88% for major depression when using a cut-off point of ≥10 (103). These robust studies provide strong evidence for the validity of the PHQ in these populations. Additionally, the PHQ-9 has been validated in the student population, against the Beck Depression Inventory (BDI) and the Mini International Neuropsychiatric Interview (MINI) (280) for accuracy in diagnosing minor and major depression. In this latter study, the PHQ-9 was shown to have a specificity of 0.99 and a sensitivity of 0.90 using a cut-off of ≥5 for minor depression, and a specificity of 0.99 and a sensitivity of 0.85 using a cut-off of ≥10 for major depression.

The construct validity of the PHQ as an instrument to measure the severity of depression was confirmed by comparison to self-reported sick days and clinic visits, difficulty caused by depressive symptoms, and the Short-form General Health Survey in a primary care and hospital outpatient groups (103). A PHQ-9 score of 5 represented mild depression, 10 moderate depression, 15 moderately severe depression and 20 severe depression. The construct validity of the PHQ-9 has also been confirmed in the general population by comparison to measures for depression (Brief-BDI), distress (GHQ-12), and subjective health perception (EuroQOL; SF-36), where it has been confirmed as a useful tool for detecting sub-threshold depressive disorder.
The PHQ-9 has been shown to be reliable in a tertiary student population, with an internal consistency of 0.85, and a good one month test-retest reliability (r=0.89, p<0.001) (280). Although the sample size of 512 students for this reliability study was adequate, the sample was comprised of a group of Nigerian students, and the findings from this specific population group may not necessarily be transferable to student populations in other countries.

In 2005, the PRIME-MD was shown to be an effective instrument for screening for Panic Disorder and General Anxiety Disorder in a primary care population when its criterion-related-validity was confirmed by comparison with the Structured Interview Guide for the Hamilton Anxiety Rating Scale (SIGH-A), and the Panic Disorder Severity Scale (PDSS) (282). The GAD-7 is the self-report anxiety module taken from the PRIME-MD diagnostic tool, and it has been validated in the general population (104) and in primary care (95). The GAD-7 was shown to have good reliability and criterion-related validity against clinical interview by a mental health professional, as well as good agreement between self-report and interviewer administered versions of the scale (95). For the GAD-7, a cut-off point of ≥10 has a sensitivity for diagnosing generalised anxiety disorder of 89% and a specificity of 82% compared with diagnostic interview (104).

3.3.8 Intervention

3.3.8.1 Intervention Development

The intervention was a self-care website called Computer Assisted Learning for the Mind (CALM). The CALM website was developed by the candidate and two Psychiatrists (Dr Tony Fernando and Dr Shailesh Kumar) in conjunction with a team of website developers. It contained written information and audiofiles to promote good mental health and wellbeing.
Audiofiles were used to deliver information with the intent of improving acceptability to the student age group. The idea for the audiofile format came from informal discussions with students, who also suggested that the topic of ‘managing relationships’ be included in the website content. The CALM website was created in order to increase the self-help resources available to students in the medical school. Dr Tony Fernando, Dr Shailesh Kumar and the candidate developed the website content. Drawing on the literature and on their combined clinical and educational experience, the three website authors decided to only include evidence-based interventions that had been shown to be effective in the prevention and early intervention of mental ill-health and the promotion of wellbeing.

The content was divided into three main sections: managing stress, anxiety and depression; mental resilience; and finding meaning in life. The first section contained explanations as to why stress, depression and anxiety can occur, some of the common symptoms or experiences, and depression and anxiety questionnaires, the PHQ-9 (103) and the GAD-7 (95, 281) with score interpretations and recommendations for management. It included many audiofiles focussing on techniques for managing stress such as progressive muscle relaxation and self-hypnosis.

The section in the CALM website on mental resilience was included in order to emphasise the positive aspects of good mental health and wellbeing, in line with the World Health Organisation’s (WHO) definition of health. The WHO definition, “health is a state of complete physical, mental and social wellbeing and not merely the absence of disease or infirmity”, was first outlined in 1946, and is still thought by many to be very relevant to health practitioners and educators (283), although some have suggested expanding the definition to encompass a spiritual dimension (284).
Positive Psychology theories stress the importance of happiness and satisfaction with life and recommend developing more positive ways of thinking as well as building resilience (60, 285, 286). The ‘mental resilience” section of the website therefore included information and exercises to aid the development of positive mind-states and attitudes, such as exercises in gratitude and compassion, which have been shown to enhance wellbeing (287, 288). There is evidence that loving kindness meditation (LKM) can cause a decrease in stress and an increase in positive emotions (289), and an increase in cognitive control and attention has also been shown after only 3 days of LKM training (290). However a review of LKM and Compassion Meditation by Hofmann et al in 2011 concluded that LKM may have a useful clinical application, but suggested that it be combined with empirically supported treatments such as cognitive behavioural therapy (291)

As well as content about managing stress and enhancing resilience positive mind-states, the CALM website included a section that focussed on the importance of connection to other people, beliefs and values. As mentioned above, having ‘a meaning in life’ and paying attention to one’s non-professional life has been reported to have protective effects against burnout (241). Similarly, in young people “religiosity” has been shown to be a suicide protective factor (239). In The CALM website this concept was described as having ‘something beyond the daily grind’ that led to the inclusion of a section on finding meaning in life, whether that be religion, a cause or a philosophy.

Several of the modules on the CALM website contained mindfulness exercises. These modules were included because of the increasing body of evidence showing the effectiveness of mindfulness meditation for anxiety (292) and depression (293, 294). Although a review of mindfulness studies in 2007 concluded that there was insufficient evidence to prove that
mindfulness improved anxiety and mood symptoms (295), there have been several subsequent studies that have found that mindfulness can reduce both psychological distress and physical symptoms (292, 296-298). A 2011 Cochrane review concluded that the evidence supports that Mindfulness Based Stress Reduction improves mental health, and that Mindfulness Based Cognitive Therapy prevents relapse of depression (299), and a 2012 Cochrane review concluded that mindfulness-based therapies were effective in reducing depressive symptoms (293). Furthermore, there is also evidence demonstrating that mindfulness interventions are effective at improving mental health and wellbeing in tertiary students (300, 301), and specifically in a medical student population (230-232). Mindfulness has been recommended as a helpful intervention to challenge the negative ruminations of students who self-harm (157).

The intervention used in many of the earlier mindfulness studies was the Mindfulness-Based-Stress-Reduction Programme (MBSR), which is a group-based programme that usually takes between eight to ten weeks to learn and have an effect (302). However, more recently, studies have been investigating the theory that even a small amount of mindfulness practice can make a difference in terms of improving mental health and wellbeing (231). The ‘minimum dose’ of mindfulness required to make an improvement in mental wellbeing is currently unknown (303).

Many of the topic web pages on the CALM website also had links to other relevant evidence-based websites, as one of the key principles of youth development is to enable young people to have access to accurate information (59). The format of the CALM site was designed to be as user-friendly and straightforward as possible, with words being kept to a minimum. Audiofiles could either be listened to directly from the computer, or by downloading them.
onto an I-pod or MP3 player for multiple use. The main topic areas and a list of the audiofiles is show in Table 3.1.

Table 3.1. Audiofiles and Documents for CALM website

<table>
<thead>
<tr>
<th>FINDING MEANING IN LIFE</th>
<th>Religion:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Anglican (audiofile)</td>
</tr>
<tr>
<td></td>
<td>Presbyterian (audiofile)</td>
</tr>
<tr>
<td></td>
<td>Catholic (audiofile)</td>
</tr>
<tr>
<td></td>
<td>Hindu (audiofile)</td>
</tr>
<tr>
<td></td>
<td>Islam (audiofile)</td>
</tr>
<tr>
<td></td>
<td>Buddhism (audiofile)</td>
</tr>
<tr>
<td></td>
<td>Finding Meaning After Adversity:</td>
</tr>
<tr>
<td></td>
<td>John Bramblitt’s story (audiofile)</td>
</tr>
<tr>
<td></td>
<td>Finding Meaning In Our Day to Day Lives</td>
</tr>
<tr>
<td></td>
<td>Philosophy (audiofile)</td>
</tr>
<tr>
<td>HEALTHY RELATIONSHIPS</td>
<td>Stages of Relationships (audiofile)</td>
</tr>
</tbody>
</table>
### Resolving Conflict in Relationships (audiofile)

<table>
<thead>
<tr>
<th>MENTAL RESILIENCE</th>
<th>Practical Techniques for Managing Stress:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Self Hypnosis (audiofile)</td>
</tr>
<tr>
<td></td>
<td>Guided Meditation on Mindfulness of the Breath (audiofile)</td>
</tr>
<tr>
<td></td>
<td>Body Scanning (audiofile)</td>
</tr>
<tr>
<td></td>
<td>Dealing With Stress - Developing a Coping Plan (document)</td>
</tr>
<tr>
<td></td>
<td>Dealing With Stress - Taking Care of Your Person (audiofile)</td>
</tr>
<tr>
<td></td>
<td>Dealing With Stress – Pros and Cons Table (document)</td>
</tr>
<tr>
<td></td>
<td>Progressive Muscle Relaxation (audiofile)</td>
</tr>
<tr>
<td></td>
<td>Dealing With Anger (audiofile)</td>
</tr>
<tr>
<td></td>
<td>Preparing for Exams (audiofile)</td>
</tr>
<tr>
<td></td>
<td>Meeting Deadlines (audiofile)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Practical Techniques in Developing Positive Mind-States:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gratitude (audiofile)</td>
</tr>
<tr>
<td>Developing Loving Kindness, Compassion and Forgiveness (audiofile)</td>
</tr>
<tr>
<td>Living Mindfully on a Daily Basis (audiofile)</td>
</tr>
<tr>
<td>Guided Meditation on Loving Kindness or Kindly Awareness (audiofile)</td>
</tr>
</tbody>
</table>

Other on-line mental health resources have been developed for tertiary students. In Australia, there is ‘The Desk’ (304), which is linked to the beyondblue website (305). The Desk is similar to the CALM website in that it contains information about anxiety and depression, alcohol and drugs, study skills and links to other resources. In addition, the Desk has information about eating disorders and bullying, and a part where it posts ‘stories’ from students about their experiences with mental ill-health. The CALM website does not have this feature. The Desk also enables the students to communicate with each other in an online ‘coffee house’, if the tertiary institution has signed up to the Desk programme.

In the USA, there is Ulifeline (306), which has many colleges and universities as part of its network. As well as providing information in the form of fact sheets about mental ill-health, Ulifeline also has a story-sharing section, similar to The Desk. Another feature of Ulifeline
is ‘ask an expert’, where students can e-mail in their questions and an answer will be posted on the ‘Frequently Asked Questions’ part of the website. However neither The Desk nor Ulifeline contains audiofiles as part of the website. A point of difference with the CALM website, is that the bulk of its content is provided in the form of audiofiles for students to listen to, so that they have the opportunity to actually practice mindfulness or loving kindness meditation, progressive muscle relaxation and self-hypnosis. This experiential component is what makes the CALM website novel.
3.3.8.2 Intervention Delivery and Web-based Data Collection

The website was available to the students over a 5-week period which commenced several weeks after study baseline assessment. For the period of the trial, the website was only available to the participants and not to the public. Students were informed of the website during the lecture at which study baseline assessments were made, and were reminded of the website in a lecture and by a class email when the website was launched. Student users entering the website were prompted to enter a unique identifier along with instructions about how to re-create this code, and they were then able to proceed to the website modules. The candidate and research assistant did not have access to this student code. Once the website was available to the study participants, the anonymous questionnaire data, which was entered on-line, was collated by an academic staff member of the website development team, and was then forwarded to the candidate.

3.3.9 Data Collection

Demographic information for the whole student group (years 2 and 3) was collected using university administrative databases. Following informed consent, baseline outcome measures of those who enrolled in the study were collected in class at the start of semester. Follow-up outcome measures were collected at 12 weeks in class. PHQ-9 and GAD-7 scores were also assessed from the website during the 5-weeks of the intervention. Accuracy of data entry was checked by using double data entry by two different individuals, and an electronic comparison of the two datasets.

At the baseline measures meeting, the students who chose to participate in the study were asked to write an anonymous ‘unique identifier’, a standardised personal formula, on their
paper baseline questionnaire before it was handed in. The unique identifier was composed of the last two letters of the city the student was born in, followed by the number of the month they were born in, followed by the first two letters of their mother’s maiden name. The students would also be asked to re-enter their unique identifier code at a future time point, when they accessed the website or completed the final questionnaires. These unique identifier codes would therefore be used to track each participant and to link to website use, whilst maintaining participant anonymity.

All of the questionnaires were stored in a locked filing cabinet, and the computer files were stored on a password-protected drive. All data will be stored for six years, after which time data will be deleted and paper copies of questionnaires confidentially recycled in line with the ethics protocol.

3.3.10 Sample Size and Power Calculations

A sample size of 264 was adequate to assess as statistically significant a difference between those accessing and those not accessing the website of 2 points on PHQ-9 or GAD-7, assuming standard deviation of 5 and n1/n2 of 3 (alpha=0.05, statistical power (1-β) =0.8). Sample size calculations and analyses used STATA 10.0 and SAS 9.0 statistical programs.

3.3.11 Data Analysis

Only data that was present was included in the analyses. Means and standard deviations were calculated by the candidate to describe characteristics of the total and sub-samples of participants. Chi-square and T-tests were used to assess differences between those accessing the website and others. Repeated measures analyses were undertaken to assess differences in on-line and in-class scores over time using SAS 9.0 statistical program by the department.
statistician. Inductive coding was used to analyse the responses to the semi-structured question, to produce qualitative data.

3.3.12 Ethical Considerations

The CALM study was approved by the University Ethics committee (no. 2008/216 Appendix 1) in 2008. The main ethical consideration was ensuring anonymity of participants, which is why the unique identifiers were used instead of passwords.

3.4 CALM Study Results

3.4.1 Participation Rates

Of the 321 medical students in years 2 and 3, 279 (87%) completed PHQ-9 and GAD-7 baseline measures.

3.4.2 Baseline Characteristics and Outcome Measures

The medical students had a mean age of 21.5 years (SD 2.7) and 167 (52%) were female. Ethnicity was diverse with 147 (46%) European, 112 (35%) Asian, 27 (8%) Pacific Islander and 11 (3%) Maori. Data from 279/321 (87%) were available for analysis of prevalence. Prevalence of any degree of depression was 48% (n=133), with 2.5% (n=7) moderately severely depressed (PHQ ≥15), 12% (n=33) moderately depressed (PHQ ≥10), and 33% (n=93) mildly depressed (PHQ≥5). Prevalence of any degree of anxiety was 37% (n=103), with 2% (n=6) moderately severely anxious (GAD-7 ≥ 15), 7% (n=20) moderately anxious (GAD-7 ≥ 10), and 28% (n=77) mildly anxious (GAD-7 ≥ 5).
During the 5 weeks when the CALM web-site was available during the study, 80 students out of 321, chose to visit the website (25%). Table 3.2 shows the demographic characteristics of those accessing the website compared with the class as a whole.

**Table 3.2: Baseline Characteristics of the Whole Class and those Accessing the Website**

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Total class of year 2 and 3 medical students (n=321)</th>
<th>Those accessing CALM Web-site (n=80)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female (%)</td>
<td>167 (52%)</td>
<td>38 (47.5%)</td>
</tr>
<tr>
<td>Age in years, mean (sd)</td>
<td>22.2 (2.9)</td>
<td>21.1 (3.2)</td>
</tr>
<tr>
<td>European (%)</td>
<td>147 (45.7%)</td>
<td>36/147 (24.49%)</td>
</tr>
<tr>
<td>Maori (%)</td>
<td>11 (3.42%)</td>
<td>3/11 (27.2%)</td>
</tr>
<tr>
<td>Pacific Islander</td>
<td>27 (8.41%)</td>
<td>4/27 (14.81%)</td>
</tr>
<tr>
<td>East Asian (%)</td>
<td>36 (11.2%)</td>
<td>12/36 (33.33%)</td>
</tr>
<tr>
<td>South Asian/Other Asian</td>
<td>76 (23.7%)</td>
<td>13/76 (17.11%)</td>
</tr>
<tr>
<td>Other (%)</td>
<td>20 (6.23) #</td>
<td>6/20 (30%)§§</td>
</tr>
<tr>
<td>PHQ-9 mean (sd)</td>
<td>5.14 (4.06)*</td>
<td>8.27 (5.74)</td>
</tr>
<tr>
<td>GAD-7 mean (sd)</td>
<td>3.91 (3.72)*</td>
<td>5.91(4.74)</td>
</tr>
</tbody>
</table>

#4 missing values; §§6 missing values; *42 missing values

The mean age of those accessing the website was 21.1 years (SD 3.2) and 38 (48%) were female. There was no significant difference in the proportion accessing the website from different ethnic groups (p=0.4). Baseline questionnaires were completed by 279/321 (87%).

Out of the 80 participants who accessed the website, 49 of them could be linked by unique identifier to baseline class scores. The mean baseline scores from this group of 49 web-users were compared with the mean baseline scores from the 230 participants who could not be
shown to have accessed the website. Those who accessed the website (and could be linked to baseline score by unique identifier \((n=49)\)) had significantly higher anxiety scores \((p=0.01)\) but not higher depression scores \((p=0.07)\) at baseline, than those who did not access the site (or who accessed the site and could not be linked \((n=230)\)) (Table 3.3).

Table 3.3: Comparison of Baseline Depression and Anxiety scores of those who did and did not access website according to linked data

<table>
<thead>
<tr>
<th>Clinical characteristics</th>
<th>Did not access by linked data Baseline in-class score ((n=230))</th>
<th>Accessed by linked data Baseline in-class score ((n=49))</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHQ9, mean (sd)</td>
<td>4.93 (4.00)</td>
<td>6.10 (4.26)</td>
<td>0.07</td>
</tr>
<tr>
<td>GAD7, mean (sd)</td>
<td>3.65 (3.59)</td>
<td>5.14 (4.10)</td>
<td>0.01</td>
</tr>
</tbody>
</table>

The follow up in-class questionnaire was completed by 218 (68%) students with mean PHQ-9 of 5.58 (SD 3.9) and GAD-7 of 4.96 (3.8). Mean scores entered at baseline, on-line and at follow up, are shown below in Table 3.4.

The proportion of students with depression and anxiety scores greater or equal to 10 were compared at baseline, on-line and at follow-up (Table 3.4). Statistical analysis is inappropriate due to the groups being a sub-set of each other. Analysis using t-tests can only be used to compare the difference between groups when there are two distinct sets of data. However, it does suggest a higher proportion of depression and anxiety in those that accessed the website. Unfortunately, many of those using the website did not use the same unique identifier as the in-class recordings, or they were different students, as many of the unique identifiers did not match. However, in those where the unique identifier did match, scores in-class at baseline, scores recorded on the web-site and scores at follow-up in class were compared.
Individuals who could be linked by unique identifier to all three time-points (n=38), self-reported significantly higher scores when on-line than when in class for depression (p=0.02) and anxiety (p=0.03), whether assessed at baseline or follow-up (Table 3.5 and Figure 3.1).

Table 3.4: Percentage of students with GAD-7 and PHQ-9 scores ≥ 10, in baseline, website and follow up groups

<table>
<thead>
<tr>
<th></th>
<th>Baseline (n=279)</th>
<th>Website (n=80)</th>
<th>Follow Up (n=218)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHQ-9</td>
<td>(40/279) 14.3%</td>
<td>(33/80) 41.25%</td>
<td>(36/218) 16.5%</td>
</tr>
<tr>
<td>GAD-7</td>
<td>(26/279) 9.3%</td>
<td>(20/80) 25%</td>
<td>(31/218) 14.2%</td>
</tr>
</tbody>
</table>

Table 3.5: Comparison of Depression and Anxiety scores between class questionnaires and on-line of those who did all 3 and were linked (n=38)

<table>
<thead>
<tr>
<th>Clinical characteristics</th>
<th>Baseline score</th>
<th>Website score</th>
<th>Follow up score</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHQ9, mean (sd)</td>
<td>6.13 (4.12)</td>
<td>7.55 (5.27)</td>
<td>6.31 (3.75)</td>
<td>0.03</td>
</tr>
<tr>
<td>GAD7, mean (sd)</td>
<td>5.24 (4.25)</td>
<td>6.60 (5.18)</td>
<td>5.39 (3.50)</td>
<td>0.02</td>
</tr>
</tbody>
</table>
3.4.2.1 Web-pages Visited

A total of 1206 page views were recorded, and of these, 934 were unique page views, indicating the number of visits to web-pages by different students. CALM sub-site topics most frequently visited by different students included “Mental resilience” (69/934 hits) and “Finding meaning in life” (68/934 hits). “Drugs” (14/934) and “Alcohol” (14/934) were the least visited sub-sites. The page views are shown in Table 3.6.
Table 3.6: The Number of Page Views Recorded of Participants Accessing the CALM Website

<table>
<thead>
<tr>
<th>Page Title</th>
<th>Page Views</th>
<th>Unique Page Views</th>
</tr>
</thead>
<tbody>
<tr>
<td>Homepage</td>
<td>170</td>
<td>115</td>
</tr>
<tr>
<td>Depression and Anxiety questionnaires and information</td>
<td>110</td>
<td>102</td>
</tr>
<tr>
<td>Finding Meaning in Life</td>
<td>94</td>
<td>68</td>
</tr>
<tr>
<td>Mental Resilience</td>
<td>89</td>
<td>69</td>
</tr>
<tr>
<td>Healthy Relationships</td>
<td>81</td>
<td>62</td>
</tr>
<tr>
<td>Managing Depression, Anxiety, Stress, Alcohol and Drugs</td>
<td>72</td>
<td>56</td>
</tr>
<tr>
<td>Stages of Relationships</td>
<td>63</td>
<td>52</td>
</tr>
<tr>
<td>Practical Techniques for Managing Stress</td>
<td>61</td>
<td>42</td>
</tr>
<tr>
<td>Developing Positive Mind States – Learning How to Be Happy</td>
<td>53</td>
<td>43</td>
</tr>
<tr>
<td>Finding Meaning After Adversity</td>
<td>50</td>
<td>37</td>
</tr>
<tr>
<td>Religion</td>
<td>48</td>
<td>39</td>
</tr>
<tr>
<td>Practical Techniques to Develop Positive Mind States</td>
<td>41</td>
<td>34</td>
</tr>
<tr>
<td>Finding Meaning in Our Day to Day Lives</td>
<td>40</td>
<td>32</td>
</tr>
<tr>
<td>Condition</td>
<td>Access</td>
<td>Logins</td>
</tr>
<tr>
<td>------------</td>
<td>---------</td>
<td>--------</td>
</tr>
<tr>
<td>Depression</td>
<td>26</td>
<td>23</td>
</tr>
<tr>
<td>Anxiety</td>
<td>25</td>
<td>21</td>
</tr>
<tr>
<td>Drugs</td>
<td>17</td>
<td>14</td>
</tr>
<tr>
<td>Alcohol</td>
<td>15</td>
<td>14</td>
</tr>
</tbody>
</table>

*151 hits not shown in table

¶ 111 hits not shown in table

Examples of pages included in ‘hits not shown on table’ are: the site map, the computer requirements, a disclaimer and a user survey.

NB: Those designing the CALM website may have contributed to the number of hits, but this number is likely to be very small.

### 3.4.2.2 Acceptability

Of the 80 people who accessed the website, 49 (61%) of them answered the open-ended question about site acceptability in the follow-up lecture. Comments from 42 questionnaires (7 answered “no comment”) were analysed (276), and the main thematic categories, with the most commonly-reported theme being listed first:

- Interesting and Audiofiles Helpful

The most common positive theme was that the site was interesting and helpful and that the audiofiles were useful:
“......It was fantastic. Only got on once but some very valuable things about mental resilience and greater meaning in life that really helped me deal with the anxiety and depression I was experiencing......”

“......Fantastic, really good advice – podcasts good idea.....”

“......Looks good, don’t need yet but will be helpful...”

• Difficulty Navigating Site:

The most common negative theme was that as a self-help tool, the site was difficult to navigate:

“......I found it quite hard to find things – I prefer websites where everything is accessible from a front page....”

“......couldn’t find self-hypnosis.....”

Of the students who did not access the website 159 (49.5%) answered the open-ended question. The main themes are stated below with the most commonly-reported theme being listed first:

• Too Busy or Forgot:

“......I had intended to, but it has not been a top priority. I heard about it and thought it sounded amazing......”

“......Didn’t get round to it.....will use it in the holidays......”
• Not Motivated or Interested

“.....Don’t believe in this hippie nonsense......”

“......No need – I feel happy, have ways I manage...”

Interestingly, the idea that they would have liked more structured personal assistance with the site was a theme both for those who had gone to the site and from those who had not:

• More (Personal) Assistance

“Maybe if we had been walked through it in a lecture via powerpoint to see what was available”

“Unfortunately a website just doesn’t have the “personal touch” I enjoy.”

3.5 Discussion of the CALM Study

3.5.1 Main Findings

In order to summarise the main findings of the CALM study, the research questions will be re-visited as shown in Table 3.7.
Table 3.7: The CALM Study Findings

<table>
<thead>
<tr>
<th>Research Question</th>
<th>Main Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>What is the use and acceptability of a self-care website to improve mental health and quality of life in a population of New Zealand medical students?</td>
<td>A self-care website was acceptable to the medical students, and was used by 25% of the group. A self-care website was accessed by those students with higher anxiety scores, but not higher depression scores.</td>
</tr>
<tr>
<td>What is the prevalence of depression and anxiety in a population of New Zealand medical students?</td>
<td>The prevalence of moderate or moderately severe depression (PHQ-9 $\geq$ 10) in a population of New Zealand medical students was 14.5%. The prevalence of moderate or moderately severe anxiety (GAD-7 $\geq$ 10) in a population of New Zealand medical students was 9%.</td>
</tr>
</tbody>
</table>

The CALM study showed that one quarter of year 2 and 3 medical students chose to access a self-care mental health website over a five week period. The site was accessed by those students with significantly higher anxiety scores in comparison to those who did not access the website. No statistically significant difference was shown in depression scores between those who accessed the website and those who did not. The reasons for this are not clear, but one possible explanation is that a lack of energy is one of the symptoms of depression but it
is not a feature of anxiety. Therefore students with depression may be less motivated to
experiment with a new website than those with anxiety. It could also be that depressed
students were in fact more likely to access the website than those who were less depressed,
but that the study was not powered enough to show this as being statistically significant.

The study also demonstrated that the website was acceptable to the student group and was
seen as useful. As well as answering the research questions, the CALM study provided two
other useful findings. The study found that whilst the students found a self-care resource to
be acceptable, they would also welcome some more personalised care as a form of additional
support. Lastly it appeared that medical students may enter different scores to self-complete
questionnaires on-line and in-class.

The fact that students who accessed CALM reported worse mental health scores on-line than
in-class, suggests that the medium or environment may have influenced responses. These
students were either feeling more depressed or anxious when they decided to access the
website, under-estimated their in-class scores, or over-estimated their on-line state, or the
medium of questionnaire affects the type of response. It is possible that students may have
entered a different score in-class while sitting next to their peers than they would on a
website because of the difference in levels of privacy. The in-class questionnaires were also
hand-written on paper whereas the website questionnaire was in an electronic format, which
may have been a factor. The difference in depression and anxiety scores may also have been
influenced by the different point in time (mid-semester vs. end of semester). However, scores
of the same individuals tended to be higher on line compared with both baseline and follow-
up in-class scores. Therefore, the candidate is not clear about the reason for the difference
between the in-class and on-line scores, as there are a number of possibilities.
3.5.2 Strengths and Limitations of the CALM Study

This study has a number of strengths. There was a high participation rate with 87% of the eligible medical students completing the baseline questionnaires; although follow-up was lower (68%), due to the lower numbers of students attending classes prior to exams. The website content and design are strengths of the study. The design used a novel and acceptable approach to deliver information (audiofiles), and the evidence-based content addressed both mental illness and mental wellbeing (8, 69, 177, 256, 257, 285, 307, 308). It is strength of the CALM study that it was able to monitor access to and assess acceptability of the self-care website. Furthermore, the study was able to compare the demographic and mental health scores of users and non-users of the website. Another strength of the CALM study is that a resource was developed which was then able to provide a platform of care for all students in the subsequent studies in the thesis.

However, one of the limitations is that the data were collected by two difference mediums, by a paper-based questionnaire completed in-class, and by on-line questionnaires for those accessing the website. Therefore the electronic questionnaire scores from those accessing the website cannot be compared to the paper questionnaire scores. The fact that the paper-based questionnaires were collected in lectures was both strength and a limitation. The strength was that this method contributed to the good response rate and that all participants completed the questionnaires at the same point in time. The limitation was that the students who did not attend these lectures were not able to contribute towards the in-class baseline and final scores of depression and anxiety, which affected the mean scores. The percentage of data that was missing was high enough to limit the interpretation of the results and limits the conclusions that can be drawn, including the estimate of prevalence of depression and anxiety. Also, the
quantitative data was collected by using self-report questionnaires, and although the measures used were well-validated, it does introduce a subjective element to the responses or potential response bias (21). Similarly, there could be bias in the analysis of the qualitative data, as it is possible that other themes and interpretations could be constructed which were different from those reported by the candidate.

The CALM study had a number of other limitations. There were several weeks between the date of the baseline assessments and the date that the students were able to access the website. This was due to the need to extend the time taken for website development. The students then only had a five week interval in which to visit the site. This limited time period could have affected the number of students who chose to visit the site. However, the fact that the website was not immediately available after being told about it in class but was available some time later may have been a more realistic assessment of the proportion likely to use such a site (25%) in an every-day setting.

In terms of assessing which of the CALM sub-site topics were most frequently visited, it was not possible to tell how many times each individual accessed the website, or which sub-sites or topics each individual visited. Over the 5-week period there were more ‘hits’ to the website than number of individuals and it is likely that some individuals accessed certain sub-sites several times while others visited a variety of the topics and sub-sites of the website. Also, those designing the website had accessed some of those sites as well and we were not able to exclude those ‘hits’ from the analysis for the 5-week period; although the number is likely to have been small.
The use of unique identifiers was less successful than hoped. Although the identifiers did provide an anonymous method of linking in-class students to those who accessed the website, there were 23 unique identifiers from people who used the website that could not be linked to in-class identifiers. All of these 23 people answered “yes” to the question “are you a 2\textsuperscript{nd} or 3\textsuperscript{rd} year medical student at The University of Auckland?” One conclusion could be that the 23 people who used the website were not in class on the days of the baseline and follow up questionnaire. Another explanation is that individual students created one or more unique identifiers, possibly due to concerns about being identified. It is well documented that medical students with depression are under-treated as they often do not seek help (186, 187). This has been found to be due to stigma and a fear that mental distress is perceived as a form of weakness that could have negative future implications for their career (187). This explanation would account for the fact that the total number of unique identifiers collected in the study was more than the total number of students in the 2\textsuperscript{nd} and 3\textsuperscript{rd} year classes. This may affect the generalisability of the findings but reflects the reality of conducting studies of a sensitive topic in a vulnerable population.

3.5.3 Comparison with the Literature

Web-based resources to improve health have been found to be feasible and acceptable in a tertiary student population (267, 309, 310). A study which looked at the design features of self-care websites and summarised student feedback, reported that the features which were rated highly by the students were ease of access, non-judgmental language and links to appropriate services (311). These were all features which were present in the CALM website.
Although the CALM study results show that those who accessed the website had higher anxiety but not depression scores than those who did not, a difference in PHQ-9 or GAD-7 score of less than 1.5, may not indicate a clinical difference in mental health. In terms of the discussion about if those most at need were the ones using the resource, it is difficult to make comparisons as there is little literature in this area. However there is one study which investigated the question of access to care, by asking students about their interest in using a hypothetical online wellbeing support system (237). This survey collected data about students’ current levels of psychological distress and their help-seeking behaviour. It also asked them about their intention to use a potential web-based mental health resource, were one to be created. The study found that the students with the highest levels of psychological distress were the ones least likely to be accessing the help that was currently available, but that these students expressed more interest (than the less distressed students) in using a hypothetical online service to support wellbeing. The results showed that 39.1%, 49.4% and 57.7% of low, moderate and severely distressed students indicated that they would use a confidential on-line service. Although there is not clear evidence linking the intention to seek help with actual help-seeking (312), it is of significance that those with higher levels of mental distress, expressed the most interest in using the on-line service, as the CALM study adds support to this finding. Similarly Finkelstein’s study demonstrated that an optional mind-body elective for a group of year two students, attracted those students with higher anxiety levels (258). So these few studies would seem to indicate that perhaps optional wellbeing services may attract those most at need. However Reuben’s study of support groups for young doctors would challenge this view, by highlighting the point that some people in distress may not choose to access optional support programmes (313).
The rates of depression and anxiety of moderate or moderately severity in the medical students participating in the CALM study were shown to be 14.5% and 9% respectively. These results are very similar to another New Zealand study which used the same instruments to measure levels of mental ill-health in medical students (27). This study stated a prevalence of 16.9% for depression and 13.7% for anxiety for the students. However, the cut-off for anxiety in this study was a GAD-7 score of ≥8, which could be one reason for the higher anxiety rate in comparison to the CALM study, which used a cut-off of ≥10. The ‘Healthy Minds’ Study which collected data from over 8000 US college students, recorded 17% of the students were as being depressed, and 10% as being anxious, which again is similar to the CALM study prevalence results (139).

The CALM study showed that the percentage of students with any severity of depression was 48%. This is also very similar to a large multicentre study in the US, which stated that 49% of medical students had depressive symptoms (166). In terms of looking at the students in the CALM study who had PHQ-9 scores at the higher end of the scale, 2.5% had a score of ≥15. Although this is a small percentage, it is important, as one US study showed that 28.5% of tertiary students with a PHQ-9 score of ≥15 also identified themselves as having suicidal ideation (118). Although the average PHQ-9 score for the class in the CALM study was not very high at 5.14, there was quite a large variance (sd. 4.06), indicating that there were reasonable numbers of students with symptoms of depression present in the class.

Alongside this, The CALM study found that many students expressed a desire for a more personal approach to support involving interaction with other people. Some of those students suggested this personal approach instead of the website, whereas others wished for this approach to complement the website. The importance of social interaction to enhance mental
health and wellbeing is supported in the literature. One large study conducted in 4746 adolescents found that social isolation was associated with higher levels of depressive symptoms, an increased risk of suicide attempts, and lower levels of self-esteem (314). This finding in adolescents has also been shown to be true in the general population, where an absence of social support was shown to be a risk factor for both the onset and relapse of depression, independent of stressful life events (238). In tertiary students, lower quality social support was linked to an increased risk of depression which was six times higher than in students who had high quality social support (315). The evidence seems clear, that a lack of social interaction is a risk-factor for mental ill-health and that social support can enhance mental health (316), and it is possible that the participants in the CALM study requested ‘a more personal’ approach as a way of enhancing their wellbeing.

Another interpretation of the finding that students would prefer a more personal approach alongside the CALM website is that it would provide the students with a choice of resources. It is possible that providing a range of options for student support may be the best approach to enhance help-seeking behaviour. In the stigmatised and sensitive area of mental ill-health, (312, 317), it is likely that particular care pathways may appeal to particular students, as individuals have different coping mechanisms and styles (256, 307).

3.5.4 Conclusions and Implications for Future Research, Practice and Policy

The results from the CALM study contribute to the existing literature by demonstrating that students with higher anxiety scores are more likely to access a self-care website than students with lower scores. The findings also demonstrate that it is feasible to deliver mental health resources via a self-care website to a population of medical students. The use of audiofiles to
provide training in stress-management and positive thinking was acceptable to the medical students, and provides an affordable and anonymous way of targeting this high risk group for future interventions.

The CALM study complements previous research, which demonstrates that interventions that are delivered electronically can be effective (268, 269, 318-320), by analysing which groups of people actually use the electronic resource in terms of their demographics and mental health characteristics. In other words it provides some answers to the question, “who chooses to access this resource?” This study has not demonstrated the effectiveness of the website, but it was not designed to do so. The resources that were made available for use on the website each already have a body of evidence behind them that supports their effectiveness in a variety of groups including the student population.

The CALM study has important implications for medical schools and beyond, as it suggests that a confidential web-based self-care resource could enable help-seeking and improve access to care amongst medical students. Resilience levels and help-seeking behaviour of medical students need to be improved because such attributes have impacts on their credibility with patients (31), as well as affecting the way they talk with patients about these issues (32, 33). There is growing evidence that the way that doctors care for themselves affects the way they care for their patients (36), and this highlights the wider significance of the study. The health of our future doctors is important given the current challenges of retention of medical practitioners, the effect on practitioner quality of life, and the high levels of mental ill-health (29, 321).
The CALM study also successfully piloted part of the research processes and measures that will be used in the subsequent studies in the thesis. Furthermore, it identified a need for a more personalised form of support. This was one of the themes of student comments, both from the people who had used the website and those who had not. The next step of this research is to design an intervention which provides more personalised support, such as a peer support programme, and to measure the effectiveness of this intervention.

After the conclusion of the study, the audiofiles on the CALM website were moved to the home page in response to participant feedback, to make them more accessible. The website was then made available to the public. Since the date of the CALM study, a few more guided meditations have been added, but otherwise the site remains as it was in the trial. The CALM website can be accessed at www.calm.auckland.ac.nz.
4 Systematic Review: Peer-led Interventions for Mental Health in Secondary and Tertiary Students:

“Who was I to be responsible if someone was thinking about killing themselves, what if I don’t know what to say, what if I say the wrong thing and make things worse...The gravity of the scenario engulfed me before we had even begun. However, once thrown head first into a role play situation I found that by being present with the student and not worrying about my next question or my anxieties, the words came easy. I have extended this approach to my history taking in the hospital, and it not only leads to good histories but also, the patients appreciate that I’m attending to them and not just their illness.”

Medical student peer leader (during ‘crises and suicide prevention’ training)

4.1 Introduction

The previous chapter reported the use and acceptability of a self-care resource to improve mental health in medical students. The current chapter will focus on the empowerment of students to look after one another using peer support. This chapter will examine the evidence for peer-led interventions by conducting a systematic review. This review will include secondary school peer-led initiatives alongside tertiary initiatives, as much of the literature is focussed on that population. The chapter will start with the rationale for peer-led interventions, followed by a brief background to the concept of peer support. It will then progress through the aims, methods, results and discussion of a systematic review of the evidence for peer-led interventions to improve mental health and wellbeing in secondary or tertiary level students.
4.1.1 Rationale for peer-led interventions in the thesis

The CALM study in this thesis demonstrated that students with higher anxiety scores were prepared to seek help, yet some mentioned they would like to have a more personalised style of support rather than, or in addition to, an anonymous website to enhance self-care. In terms of the provision of support, there is evidence to show that medical students choose to approach peers for support rather than seeking help from health professionals or Faculty members, due to stigma and fears about confidentiality (138, 186, 187, 191). This finding has been supported by a New Zealand study, which reported a high preference for seeking out a peer (23.8% “strongly agree”, 97.5%, “cumulative agree”), a small number who would talk with a Faculty member (2.5% “strongly agree”, 27.5% “cumulative agree”) and a similar low number who would seek support from a psychologist or counsellor (6.3% “strongly agree”, “27.5% cumulative agree”) in times of distress (191.).

Previous research has also demonstrated the importance of peer relationships for students as a coping mechanism at university (322, 323). In the extreme situation of suicide, suicidal young adults prefer to talk to a peer rather than a parent, staff member or counsellor (324, 325). One New Zealand study showed that students were willing to seek help for a peer who expressed suicidal concerns (326). However, there have been some concerns that untrained peers may not always respond in the most helpful way to encourage appropriate help-seeking and refer in times of crisis (327). Programmes where peer leaders have been trained to provide support, have been shown to enhance help-seeking (328) and to be effective in the prevention of mental ill-health (329).
4.1.2 Background

‘Peer support’ can be defined as a variety of interpersonal helping behaviours assumed by non-professionals who undertake a helping role with others who are ‘peers’. It includes one-to-one helping relationships, group leadership, discussion leadership, advice, tutoring, and all activities of an interpersonal helping or assisting nature (330). The term ‘peer-mentoring’ has also been used to describe the concept (331, 332). However, the word ‘mentor’ can have a variety of definitions (333), and is thought to encompass a number of roles often including the provision of academic support (246, 334).

Peer support, when used in the context of the three studies in this thesis, involves leadership, role modelling, social connection, cognitive and emotional processes. Thus it is not solely a ‘training exercise’ between peer leader and fellow student, where the leader offers advice or knowledge and there is a learning process whereby the peer gains knowledge and skills. It is a wider concept that includes the previous skill levels, cognitive, social and emotional state of leader and peer, the empathic relationship which develops between them in the peer support context, and the environment in which this all unfolds. A peer support programme aims to allow ‘emerging adults’ to explore new roles and increase their self-sufficiency and requires active participation at a grass-roots level, in keeping with the concept of empowerment.

Previous authors have used a variety of theories on which to base research into aspects of peer support (335, 336). Bandura’s Social Learning Theory has been cited as a useful theoretical construct in the area of peer counselling (337, 338). The basic principle of social learning theory is that learning occurs by observation of role models. The steps in this
process are observation of the behaviour and its outcomes, retention of this information, capacity to reproduce the behaviour, and motivation to behave in this way. An individual’s cognitive and biological intrinsic factors, behaviour and the environment are all linked in a reciprocal fashion and can thus all have an impact on each other. In terms of applying social learning theory to peer support, certainly a peer could learn from observing the behaviour of a peer leader role-model and could be motivated to imitate this behaviour. Furthermore, the intrinsic make-up of the individuals involved, along with the environment could have an impact on behaviour (e.g. help-seeking behaviour) and vice-versa. Therefore the candidate agrees that this model is congruent with the central concepts of peer support.

In searching for a theoretical perspective of peer mentoring, Pfister cites House’s ‘four categories of social support’ as a useful model (339). Pfister describes this theory as “attachments among individuals that improve adaptive competence, promote emotional mastery, offer guidance with problems, provide feedback to validate identity, and foster improved performance” (339)(p.46). This description resonates with the peer-intervention work undertaken in this thesis, in terms of the components of the intervention and the empowerment focus (39). When discussing empowerment, Perkins states that such an approach “connects mental health to mutual help” (39)(p.569), which highlights the fact that peer-mentoring can be of benefit to both parties. This is very relevant in a peer support context as the literature is clear that there are many benefits for the peer leaders (340), as well as for those they are supporting or teaching (341-343).

There are many descriptions of peer support programmes in the literature. Peer support programmes which are intended to improve mental health and wellbeing, are by their nature, preventative and could thus be viewed as focussing on health promotion rather than on the
treatment of disease (344). There are also many descriptions of peer tutoring, which has been shown to be effective in terms of improved academic performance for both peer-led participants and for peer tutors (345, 346). As well as improving academic performance, peer-tutoring programmes have also been shown to create a feeling of ‘community and classroom connectedness’ (347) and to enhance wellbeing (348).

Implementation of a peer support programme will require governance from the wider organisation to ensure appropriate structures are in place (349, 350). The role of the peer leaders must be clearly outlined (351), they will require some type of training (250, 349, 352) and they may also need to have on-going supervision (353). It is recommended that training and supervision of the peer leaders is provided by a counsellor or other skilled mental health professional (354). One study, for example, reported that there were a greater number of completed suicides at schools where the peer support programme were supervised by non-clinicians (355). The suggested structure for a peer-led programme is depicted in the tiered pyramid shown in Figure 4.1.
For the purposes of this thesis, the candidate will use the terms ‘peer support’, ‘peer-leader’ and ‘peer-led initiatives’ and ‘peer-led interventions’ to refer to the process of trained peer leaders using empathic listening skills to clarify and assess a peer’s problems with a view to enabling them to seek appropriate help. In the context of this thesis, ‘peer support’ will also include elements of peer teaching and enhancing social connection.

4.2 Systematic Review Research Question

The systematic review addresses the question: What is the current evidence for the effectiveness of peer-led interventions in improving the mental health and quality of life in secondary and tertiary students?
4.3 Systematic Review Methods

This section will outline the methods used to conduct the systematic literature review. The inclusion criteria for the selected studies, the databases searched, the search terms used, and the data extraction and analysis will be outlined.

4.3.1 Study Inclusion Criteria

4.3.1.1 Study Population

The first inclusion criterion was that the study participants had to be students at a secondary or tertiary institution. In order to be included in the review, the study population must have been defined by its status as a student body, in other words a group of people who were enrolled in an educational institution. Although the candidate’s primary focus was on tertiary students, a preliminary look at the literature had signalled that it might also be useful to refer to some of the research that had been undertaken in secondary schools, as many peer-intervention studies have been conducted in this population. Secondly, the definition of ‘secondary’ and ‘tertiary’ education can vary between countries, with students in some countries such as the UK, going to a tertiary institution or ‘college’ when they are still sixteen. As there was no consistent age cut-off world-wide for ‘tertiary students’, it was to include all studies from both secondary and tertiary student populations.

4.3.1.2 Study Type

Included studies had to have a comparative study design using an intervention group and a comparison group. This included randomised and non-randomised controlled trials. Although it would have been the ideal to include only RCT’S and cluster RCT’S, there was a small
number of eligible trials, and therefore a lower level of evidence was also included by including all trials with a control group. Cohort studies were excluded as the review was looking specifically at studies which were designed to address the question of effectiveness. Whilst cohort studies make associations and record subsequent outcomes, they do not provide evidence about effectiveness. Furthermore, randomised controlled trials and controlled trials use an experimental intervention, whereas cohort studies are usually observational over time without active introduction of an intervention. Cross-sectional studies and qualitative studies were excluded from the systematic review. However, no methodological filters were used in the search initially because all types of studies about peer-led initiatives were of interest to the candidate to inform the general background and discussion of the review and subsequent research. The systematic review focussed on studies published between 1990 and 2011. Only studies with the full text published in English were included, as the candidate did not have the resources to fund manuscript translation.

Another criterion for the study to be included was that a significant proportion of the intervention had to be peer-led. For the purposes of this review, ‘peers’ were defined as students at the same institution who were up to four years senior to the study participants, a ‘significant proportion’ was defined as being over fifty per cent of the intervention, and ‘peer-led initiative’ was defined as an initiative that was run by peer leaders. Although the peer leaders themselves may have initially been trained or supervised by a senior person, this did not exclude the study from the review unless the senior person had been directly involved in the delivery of care to the wider student group.
4.3.1.3 Study Outcome Measures

For inclusion in the review, the effectiveness of the intervention had to have been assessed using quantitative measures, and these outcome measures had to include some assessment of mental health or wellbeing. The terms ‘mental health’ and ‘wellbeing’ are broad terms that can encompass a wide range of conditions and levels of quality of life. For instance, consideration was given to whether the review should also include addictions such as smoking and alcohol because of the overlap with co-existing mental health disorders (7). However a decision was made that evidence of the effectiveness of peer-led interventions for changing such health behaviour was a separate topic from interventions that could have an impact on mental health in general and resistance to stress, and so studies focussing on smoking, alcohol and drug use were excluded at the beginning of the search.

4.3.2 Study Exclusion Criteria:

4.3.2.1 Study Population

Studies with students who were at ‘middle’ or ‘intermediate’ school were excluded from the review as it was thought unlikely that interventions with younger participants would be relevant for the tertiary student population.

Students from a population group defined by disorder, for example students with learning disorders, Autism or Eating Disorders, were not included if the study participants were defined as a group solely by their mental state. This is because the candidate’s interest was in peer interventions that could be effective in the wider student population.
Studies were also excluded if they only assessed the effect of a training programme on peer leaders, and did not measure outcomes in the peers who participated in the intervention. This is because the candidate’s interest was in the effectiveness of the intervention on those who were receiving the intervention, rather than on those who were delivering it.

As the focus of the review was on identifying possible helpful intervention strategies to enhance good mental health, studies were excluded that did not describe a peer support programme, but instead focussed on peer to peer interactions that could cause harm, such as bullying. Also excluded, were studies that had been conducted after a disaster or a traumatic event had occurred. These were considered not to be of relevance to this review, as the interventions of interest were preventative ones that had been designed to promote stress-resistance i.e. response to daily stress, rather than to assist an adaptive response after a challenge.

4.3.3 Search Strategy

Three main concepts were used for the search: ‘Students’, ‘Mental Health’ and ‘Peer-led’. Search terms used were synonyms of these terms. Four databases were searched: Medline, Embase, PsychInfo and Cinahl Plus. Reference lists from relevant studies were also searched, which yielded theses of possible interest as well as studies published in peer-reviewed journals. One study author was contacted after giving a presentation of a relevant study at a conference. The detailed search strategy that was used for Medline is shown in Table 4.1.
Table 4.1: Medline Search Strategy

<table>
<thead>
<tr>
<th>Search Terms</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. (peer? adj3 (tutor* or interven* or instruct* or assist* or mentor* or counsel* or support* or taught or teach* or led or run)).tw.</td>
</tr>
<tr>
<td>2. (student? adj3 (interven* or instruct* or assist* or mentor* or counsel* or support* or taught or teach* or led or run)).tw.</td>
</tr>
<tr>
<td>3. exp Peer Group/</td>
</tr>
<tr>
<td>4. peer group*.tw.</td>
</tr>
<tr>
<td>5. peer-peer.tw.</td>
</tr>
<tr>
<td>6. (gate keep* or gatekeep*).tw.</td>
</tr>
<tr>
<td>7. exp Gatekeeping/</td>
</tr>
<tr>
<td>8. or/1-7</td>
</tr>
<tr>
<td>9. exp Mental Disorders/</td>
</tr>
<tr>
<td>10. exp Mental Health/</td>
</tr>
<tr>
<td>11. exp Resilience, Psychological/</td>
</tr>
<tr>
<td>12. exp Stress, Psychological/</td>
</tr>
<tr>
<td>13. exp Depressive Disorder/</td>
</tr>
<tr>
<td>14. exp Depression/</td>
</tr>
<tr>
<td>15. exp Anxiety/</td>
</tr>
<tr>
<td>16. exp Anxiety Disorders/</td>
</tr>
<tr>
<td>17. exp &quot;Quality of Life&quot;/</td>
</tr>
<tr>
<td>18. exp Crisis Intervention/</td>
</tr>
<tr>
<td>19. exp Suicide/</td>
</tr>
<tr>
<td>20. depress*.tw.</td>
</tr>
<tr>
<td>21. (anxiet* or anxious).tw.</td>
</tr>
<tr>
<td>22. (wellbeing or well being).tw.</td>
</tr>
<tr>
<td>23. (quality adj1 life).tw.</td>
</tr>
<tr>
<td>24. exp Adaptation, Psychological/</td>
</tr>
<tr>
<td>25. emotion*.tw.</td>
</tr>
<tr>
<td>26. ((mental* or psycholog*) adj5 (health* or ill or illness or disorder*)).tw.</td>
</tr>
<tr>
<td>27. (mental health adj3 (program* or initiative? or service? or curricul*)).tw.</td>
</tr>
<tr>
<td>28. resilien*.tw.</td>
</tr>
<tr>
<td>29. stress*.tw.</td>
</tr>
<tr>
<td>30. suicid*.tw.</td>
</tr>
<tr>
<td>31. or/9-30</td>
</tr>
<tr>
<td>32. exp Students/</td>
</tr>
<tr>
<td>33. exp Schools/</td>
</tr>
<tr>
<td>34. exp Universities/</td>
</tr>
<tr>
<td>35. (faculty or college or tertiary or universiti* or undergrad* or graduate or postgrad* or school*).tw.</td>
</tr>
<tr>
<td>36. education/ or exp curriculum/ or vocational education/ or education, predental/ or education, premedical/ or exp education, professional/</td>
</tr>
<tr>
<td>37. exp Faculty/</td>
</tr>
<tr>
<td>38. student*.tw.</td>
</tr>
</tbody>
</table>
A wide variety of terms are used in publications to describe peer-led initiatives as there is no standard phrase in common use. This meant that in order to ensure the search was sensitive enough to identify all relevant studies, a large number of articles had to be screened. Initially this was carried out by considering the title and by excluding all articles that clearly did not meet the review inclusion criteria. Duplicate articles were also counted and excluded at this point. If it was not clear from the title whether the study used mental health measures or if it were peer-led as defined by the inclusion criteria, then the abstract was read. Abstracts were studied for all articles where further clarity was needed, and if the relevant information was not provided in the abstract, then the whole article was retrieved. Frequently it was not
possible to tell from the article title or abstract what proportion of the intervention had been led by peers and to determine the level of adult involvement. Another common reason for accessing the whole article was to clarify if a component of the peer-led initiative had been designed to focus on mental health and wellbeing, and to check if this were being measured. Where necessary, authors were contacted to clarify inclusion criteria of the intervention, outcome measures used or results.

4.3.4 Data Extraction and Analysis

The review of all titles and abstracts was conducted by the candidate who then discussed possible inclusion and exclusion criteria with the two supervisors until consensus was reached. If there was any doubt about the possible inclusion of a study, it was reviewed by all three of the above people.

4.3.4.1 Quality Assessment

Critical appraisal was performed using the 23-item ‘Non-pharmacologic Treatment’ (NPT) extension of the CONSORT (Consolidated Standards of Reporting Trials) statement (356, 357). First published in 1996, the CONSORT guidelines were developed by a multidisciplinary team of experts in order to address the problem of inadequate reporting of trials, by providing a set of recommendations. These guidelines were revised in 2001 and again in 2010, with the 25- item checklist from 2010 remaining the current recommended guideline (358, 359), and they have been adopted by many journals (360). The CONSORT document has also been modified to address issues that are specific to certain types of trials, and these modified versions are called ‘extensions’. One of the extensions provides reporting recommendations for non-pharmacological treatment (NPT) interventions (356). This
extension was published in 2008 and was based on a revision of the 2001 22-item checklist. The revision modified eleven of the items on the 2001 checklist and also added one item which involved giving details of the implementation of the interventions. Thus the NPT extension is comprised of a 23-item checklist and it was selected as the most appropriate tool for critically appraising the studies in this systematic review.

The NPT extension to The CONSORT statement takes into account study features such as complex interventions or issues with blinding. This makes it a suitable assessment tool for appraising studies of peer-led interventions, as many of these include several components, and blinding of all relevant parties is usually not possible. The original CONSORT guidelines advocate the reporting of the blinding status of all of the people involved in the trial, including the participants, the healthcare providers who care for the participants during the trial, the data collectors and the outcome adjudicators (361). Whereas in a pharmacological trial it could be possible for the healthcare providers to be blinded, for instance if they were handing out a placebo, in a trial where the intervention consists of the provision of psychological assistance, it would not be possible to blind the healthcare providers, or in this case, the peer leaders. The NPT extension to the CONSORT statement highlights the fact that although this is the case, it may however be possible to blind the data collectors, the outcome adjudicators, or in some instances even to partially blind the participants for example by not disclosing the study hypothesis. The guidelines recommend that this level of detail about blinding is included when reporting the methodology of a non-pharmacological randomised trial (356).

Although they were originally designed to improve the reporting of two-arm randomised clinical trials, the CONSORT checklists can also be applied to trials with other comparative
study designs that involve analysing and reporting quantitative data, where relevant checklist items can be selected (362). The CONSORT checklists were primarily designed as tools to improve the reporting of trials, but they can also be used to aid the critical appraisal and interpretation of studies (363).

The studies were graded for quality using the scoring system developed by King et al, whereby the study is given a score of 0, 1 or 2 for each of the items on the CONSORT questionnaire (363). A score of 0 means that the item is ‘not present at all’, ‘1’ means that it is ‘partially present’ i.e. some parts may be missing or unclear, and a score of ‘2’ means that item is assessed as being ‘present and clear’. The selected studies of peer-led interventions were analysed and scored independently by each of the candidate and two supervisors using this scoring system.

The full text of all identified articles was analysed by the candidate and then by the two supervisors who performed independent critical appraisals. The candidate reviewed all three appraisals and decided on the final scores for the included studies.

4.4 Systematic Review Results

4.4.1 Studies Identified

From all databases, a total of 8,395 studies were identified and the titles were screened. The studies were sourced from Embase (1192 articles), Medline (1982), PsychInfo (3732), and Cinahl PLUS (1489), with 2,118 duplicates (Figure 4.2.). From these, 141 abstracts were reviewed, 42 full-text articles were retrieved and reviewed, 1 further article was added from a
conference presentation and 8 studies met the criteria for inclusion in the review. Reasons for exclusions are shown.

### 4.4.2 Study Characteristics

Table 4.2 presents a summary of the characteristics of the included studies.
8395 records identified through database searching

Screening

6277 titles screened

2118 duplicates removed

6277 titles screened

6136 records excluded as not relevant to topic

141 abstracts screened

99 records excluded as not relevant to topic

42 full-text articles assessed for eligibility

35 full-text articles excluded:
not peer-led initiative: n=16
study design: n=17
population group: n=2

1 article included from conference presentation

8 articles included in systematic review
### Table 4.2: Characteristics and Outcomes of Studies Included in the Systematic Review of Mental Health and Wellbeing in Secondary and Tertiary Students

<table>
<thead>
<tr>
<th>Author and Study Objective</th>
<th>Participants</th>
<th>Study Design</th>
<th>Mental Health and Wellbeing Outcome Measures Used</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fontana, A. et al; (364)1999, US</td>
<td>Introductory level Psychology students. Intervention group (n=18) and wait-list control group (n=18) Volunteered as part of lab requirement – then split into 2 groups after baseline data collected Excluded those with previous or current psychiatric disorders</td>
<td>Randomised controlled trial Wait-list control Measures taken: Pre-treatment (T1) Post-treatment (T2) Follow up (6 months after post treatment)(T3) Each measurement session took 4 readings: Mean SBP, DPB &amp; HR for minutes 12-14 (‘baseline’ minutes)</td>
<td>Physiological: • Systolic and diastolic blood pressure (SBP, DBP) • Heart rate (HR) Psychological: State-Trait Anxiety Inventory (STAI) 20 items measuring state anxiety Cohen-Hoberman Inventory of Physical Symptoms (CHIPs) measuring stress-related physical symptoms</td>
<td>Heart Rate: Between-group difference was statistically significant (for all 4 heart rate readings): i.e. the increase in heart rate scores over time (T1-T2) for the control group was significantly higher than the change in heart rate scores for the intervention group (p&lt;0.05) Within-group difference was significant only for the control group i.e. there was a significant elevation in heart rate over time (T1-T2) (p&lt;0.05). There was no significant change in heart rate over time (T1-T2) for the intervention group (p&gt;0.05) Blood Pressure: No post treatment differences in Blood Pressure were found between the groups (p&gt;0.05) State Anxiety: Between-group difference was significant: – i.e. the increase in</td>
</tr>
</tbody>
</table>
| Short et al, (365) UK 2010 | To evaluate the effectiveness of peer coaching on student wellbeing. The intervention group had training: a weekly 1-hour lecture and a 1-hour tutorial for 12 weeks (on relationships, health and careers) prior. Pre and post measures were then taken 6 months after the intervention ended. | Controlled trial | General Health Questionnaire (GHQ-12) measuring Psychological Distress | Psychological Distress
Within-group differences: There was a statistically significant deterioration in psychological distress in the control group over the duration of the study (p=0.002). Change in the intervention group did not reach statistical significance (p=0.59). Difference in change between the groups was not reported.

Personal Problems
Within-group differences: There was no statistically significant change in personal problems between the groups over the duration of the study. |
weeks apart and during this period, they engaged in 5 sessions of peer coaching. Post-measures were taken 2 weeks prior to exams.

Post-measures were taken 2 weeks prior to exams. However there was a trend towards improvement in personal problems score in the intervention group, although this did not reach statistical significance (p=0.058). Difference between the groups over time was not reported.

**Wyman, P. et al ; (329)2010, US**

To evaluate the effectiveness of the ‘Sources of Strength Suicide Prevention (SOS) Programme’

Programme aim: to change social norms of the school and enhance protective factors in peer leaders.

Peer leaders’ model and encourage others to name and engage trusted adults, to reinforce the expectancy that students ask adults for help for their suicidal peers, and to identify and use coping resources. After peer leader training, 18 secondary schools: (6 urban schools in Phase 1 of study, and 12 predominantly rural schools in Phase 2

453 peer leaders assessed from all schools

2675 students assessed from Phase 2 schools

Cluster randomised controlled trial

Measures at baseline and at 4 months

### Measures for All Students:
- Help for Suicidal Peers
- Reject Codes of Silence
- Help-Seeking from Adults
- Use of SOS Coping Resources
- Suicidal Ideation

### Measures for Peer Leaders:
- Referred Distressed Peers to

<table>
<thead>
<tr>
<th>Measuring</th>
<th>All Students: Between-group differences (i.e. differences between intervention and control groups)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Suicide Perceptions and Norms:</strong></td>
<td><strong>Perceptions of Help for Suicidal Peers</strong> – higher expectations that adults at school would help suicidal students (p= 0.03)</td>
</tr>
<tr>
<td></td>
<td>NB. The largest increase was in students with a history of suicidal ideation</td>
</tr>
<tr>
<td><strong>Reject Codes of Silence</strong></td>
<td>There was a trend towards higher scores in the intervention group, but this was not significant (p=0.17)</td>
</tr>
<tr>
<td></td>
<td><strong>Social Connectedness</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Help-Seeking From Adults</strong> –</td>
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</tbody>
</table>
there was a school-wide messaging phase that included dissemination of messages about the SOS programme by the peer leaders using presentations, texts, video and social networking sites.

<table>
<thead>
<tr>
<th>Adults</th>
<th>increased norms for help-seeking from adults at school in the intervention group compared with the control group (p=0.04)</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Support to Peers</td>
<td>• Use of SOS Coping Resources: no significant difference between the groups in use of SOS coping resources (p=0.97)</td>
</tr>
<tr>
<td>• Help for Suicidal Peers by Adults</td>
<td></td>
</tr>
<tr>
<td>• Reject Codes of Silence</td>
<td></td>
</tr>
<tr>
<td>• Maladaptive Coping</td>
<td></td>
</tr>
<tr>
<td>• Help Seeking From Adults at School</td>
<td></td>
</tr>
<tr>
<td>• Use of SOS Coping Resources</td>
<td></td>
</tr>
<tr>
<td>• School Engagement</td>
<td></td>
</tr>
<tr>
<td>• Trusted Adults Identified</td>
<td></td>
</tr>
</tbody>
</table>

Suicidal Ideation
Decreased in the intervention group, but the difference was not significant (p not reported)

Peer Leaders: Between-group differences (intervention compared with control)

Peer Leader Behaviours

- Referral of Peers to Adults because of concerns re suicide: increased referral of distressed peers to adults by 4.12 times (p=0.03)
- Support to Peers – increased provision of support provided by peers (p=0.015)

Suicide Perceptions and Norms:

- Perceptions of Help for Suicidal Peers – higher expectations that
<table>
<thead>
<tr>
<th>First year college student athletes. Student athletes assigned to Faculty mentors (n=31) Student athletes assigned to peer mentors (n= 30)</th>
<th>Mixed methods Randomised controlled trial (comparing two interventions)</th>
<th>Quantitative Tools: Perceived Stress Scale (PSS) Perceived Social Support Friends Survey (PSS)</th>
<th>Perceived Stress Levels Between-group difference was not significant: i.e. there was no difference in the change in Perceived Stress levels over time between the faculty-mentored and the peer-mentored groups (p=0.8) Within-group difference was not significant for either group: neither the faculty-mentored group (p=0.72) nor...</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pfister, V. ; (339)2004, US</td>
<td>To evaluate the effects of faculty mentoring and peer mentoring on perceived stress and social support in college athletes. This compared a group of college athletes who had faculty mentors, with...</td>
<td>...</td>
<td>...</td>
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</tbody>
</table>
A group of college athletes who had peer mentors over a 16 week Semester. The mentors had at least 9 weekly meetings with mentees, 3 of which could use tele-mentoring. Topics covered organizational skills, involvement with activities of interest outside of his or her sport, learning about institutional resources, handling of stressful situations, and general transition to the college lifestyle of a student athlete.

<table>
<thead>
<tr>
<th>Mentors: faculty (10) and student (17)</th>
<th>Pre-treatment (start of Semester)</th>
<th>Mid-Semester</th>
<th>Post-treatment (end of Semester)</th>
<th>Qualitative tool: Monitoring the Quality of the Mentoring Interaction Interview</th>
<th>the peer-mentored group (p = 0.12) showed a significant increase in Perceived Stress scores at Time 3 compared to Time 1</th>
</tr>
</thead>
</table>

Perceived Social Support from Mentor: Between-group difference was significant: i.e. the increase in Perceived Social Support from Mentor scores over time for the Faculty-mentored group was significantly higher than the Perceived Social Support from Mentor scores for the Peer-mentored group (p=0.0001)

Jones, D. ; (366)1999, US To evaluate the effects of peer sponsorship and stress-management training on depression and marital satisfaction in theological students

The study ran for 14-15 weeks (6 weeks prior to the start of the Semester until Week 8 or 9 of the Semester)

<table>
<thead>
<tr>
<th></th>
<th>Married new students at a Baptist Theological Seminary</th>
<th>Randomised controlled trial (comparing three interventions)</th>
<th>Beck Depression Inventory (BDI- II)</th>
<th>Dyadic Adjustment Scale (DAS): measures marital satisfaction</th>
<th>Depression: Between-group difference was not significant i.e. there was no difference in the depression scores between all 3 groups at the post-intervention measurement (p=0.56)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group 1</td>
<td>Group 1 (enrolled n=37; analysed n=33) Group 2 (enrolled n=36, analysed n=34) Group 3 (enrolled n=41, analysed n=41)</td>
<td>Measures taken at: Post-treatment only</td>
<td>Measures taken at: Post-treatment only</td>
<td>Measures taken at: Post-treatment only</td>
<td>Measures taken at: Post-treatment only</td>
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</table>

Marital Satisfaction: Between-group difference was not significant i.e. there was no difference in the Marital Satisfaction scores between all 3 groups at the post-intervention measurement (p=0.88)
(current students) contacted the new students before they started. The sponsors had a checklist of activities including meeting the new student on arrival, showing them around the campus and surrounding area, inviting them to church and meeting up with them in week 1.

Group 2: Stress-management intervention. This group was sent a 90 minute stress-management video and listening guide 6 weeks prior to the start of the Semester.

Group 3; Control group (no intervention)

Hixenbaugh, P. et al, (367)2006, UK
To evaluate the effectiveness of an anonymous peer e-mail mentoring programme

1st year Psychology students, 3rd Year Psychology students were peer mentors. The scheme aimed to facilitate the 1st intake of 1st year students: (2001-2002)(control group ,n=81) (2002-2003) (intervention group, n = 126)

<table>
<thead>
<tr>
<th>Interventions</th>
<th>Controlled trial (using historical controls)</th>
<th>General Self-Efficacy Scale (GSE)</th>
<th>Rosenberg Self-Esteem Scale (SES)</th>
<th>Satisfaction with the University*</th>
<th>Academic Ambition*</th>
<th>Financial concerns*</th>
<th>Social Integration*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baseline (the year before the scheme began?)</td>
<td>Week 1 of academic year</td>
<td>Middle of</td>
<td>Social Integration: Between-group difference was significant i.e. the increase in social integration scores over time for the intervention group was significantly higher than the increase in social integration scores for the control group (p=0.001)</td>
<td>Within-group difference was highly significant for both the control and intervention groups i.e. there was a</td>
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</table>

(Analysis was undertaken including only those who participated in the allocated intervention and completed the follow-up questionnaire).
year students’ feelings of integration into the university and improve the quality of their experience.

Each mentor had 4-5 mentees and was instructed to e-mail them from week 1 and to ‘maintain regular contact with their mentees’. Communication was anonymous with a code for an e-mail address.

<table>
<thead>
<tr>
<th>Pratt, M et al, (316)2000, First year students</th>
<th>Randomised Social Provisions</th>
<th>Adjusted to University</th>
</tr>
</thead>
</table>

| academic year Last week of academic year | validated for this study | significant elevation in social integration scores over time (p<0.0005). |

Satisfaction with University Support: Between-group difference was not significant i.e. the decrease in satisfaction with the university over time in the intervention group was not significantly different to the decrease in satisfaction over time for the control group (p=0.40)

When comparing the two groups at one point in time, there were higher levels of satisfaction with the university in the intervention group when compared to the control group. This difference was significant immediately after induction (p=0.03) and at the end of the year (p=0.03), but not at the mid-point of the year (p=0.49)

Within-group difference was significant for both the control and the intervention groups i.e. there was a significant decrease in satisfaction scores over time (p<0.006)

Self-Esteem and Self-Efficacy: No significant results (details not reported)
Canada, To evaluate the effectiveness of a social discussion intervention programme on the transition to university

The intervention spanned a 6 month period. It consisted of 9 tutorials (each 75-85 mins. long) run by 2 peer leaders. The peer leaders were senior undergraduate or Masters Psychology students. Topics covered were social ties, peer pressure, personal values, academic expectations and reality, and living situations and future plans.

<table>
<thead>
<tr>
<th>Time Point</th>
<th>Intervention Group (n=60)</th>
<th>Controlled Trial</th>
<th>Outcome Measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baseline</td>
<td></td>
<td></td>
<td>Scale (Cutrona)</td>
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<td>Mid-point</td>
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<td>Centre for</td>
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<td>Epidemiological</td>
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<td>Study of</td>
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<td>Depression</td>
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<td>Final</td>
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<td>CES-D</td>
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<td></td>
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<td>UCLA Loneliness</td>
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<td></td>
<td></td>
<td></td>
<td>Scale</td>
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<td>Student</td>
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<td></td>
<td></td>
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<td>Adaptation</td>
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<td>to College</td>
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<td></td>
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<td></td>
<td>Questionnaire</td>
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<td>(SACQ)</td>
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<td>Perceived</td>
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<td>Stress Scale</td>
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<td>(PSS)</td>
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<td></td>
<td>Dispositional</td>
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<td></td>
<td></td>
<td></td>
<td>Optimism: Life</td>
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<td></td>
<td></td>
<td></td>
<td>Orientation</td>
</tr>
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<td></td>
<td></td>
<td></td>
<td>Test (LOT)</td>
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<td></td>
<td></td>
<td></td>
<td>Behavioural</td>
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<td></td>
<td></td>
<td></td>
<td>Problems</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Absenteeism</td>
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<tr>
<td></td>
<td></td>
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<td>from class</td>
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</tbody>
</table>

Between-group difference was statistically significant: i.e. the intervention group had better Adjustment to University scores over time, than the control group (p<0.05)

Social Support
Between-group difference was significant for women (but was not significant for men): i.e. the intervention group women had a significantly bigger increase in Social Support scores over time, than the control group (p<0.05)

Depression
Between-group difference was significant for women (but was not significant for men): i.e. the intervention group women had a significant reduction in Depression scores over time compared to the control group (p<0.01)

Loneliness
No significant between-group difference in scores over time

Perceived Stress
No significant between-group difference in scores over time
Xenos, Chester, & Ryan (348) 2009, Australia
To evaluate the effectiveness of an embedded peer tutoring model in three disciplines: Psychology, Civil Engineering and Industrial Design

The Peer-to-peer programme (P2P) involved a pair of peer tutors working with a group of 5 or less Yr 1 students. Peer tutors were students in Years 2-4 in the same discipline. They worked on key assessment tasks with their groups over a 7 week period. Control groups were led by staff. All tutors (staff and peer leaders) covered the same content by using standardised manuals.

<table>
<thead>
<tr>
<th></th>
<th>Pre-test</th>
<th>Post-test 12 week</th>
<th>Randomised controlled trial</th>
<th>Measures for Student Group:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>6 month follow up</td>
<td>Each of the 3 disciplines also had a Control Group, made up of students in the same course with a staff tutor.</td>
<td>• Depression Anxiety and Stress Scales (DASS-21)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(Psychology students only)</td>
<td></td>
<td>• Satisfaction with Life Scale (SWLS)</td>
</tr>
<tr>
<td></td>
<td>1st Year Psychology students</td>
<td>Intervention group (n = 21)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Control group (n=46)</td>
<td>Control group (n=46)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Peer Tutors (n=27)</td>
<td>Peer Tutors (n=27)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1st year Engineering students (n=103)</td>
<td>Intervention group (n=34) control gp</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Peer Tutors (n=52)</td>
<td>Peer Tutors (n=52)</td>
<td></td>
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<tr>
<td></td>
<td>1st year Industrial</td>
<td>Peer Tutors (n=52)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Measures for Peer Leaders:
• Depression Anxiety and Stress Scales (DASS-21)
• Satisfaction with Life Scale (SWLS)

SWLS, Depression, Anxiety and Stress (Psychology Students): Between-group difference:
No evidence of comparisons between and intervention and experimental group was found.

Within-group difference:
Time differences (pre- versus post) were noted for SWLS, depression and stress (p < 0.05) in the peer-taught participants

No differences over time were noted for the peer mentors.

SWLS, Depression, Anxiety and Stress (Engineering Students): Between-group difference:
No significant differences were noted between the control and intervention groups (p < 0.05), using one-tailed independent samples t-tests and a one-way between-groups analysis of covariance.

Within-group difference:
*these results have been taken from the project report and the conference proceedings after correspondence with the author

<table>
<thead>
<tr>
<th>Design students Intervention Group (n=16)</th>
<th>Control (n = 59)</th>
<th>Peer Tutors (n=10)</th>
</tr>
</thead>
</table>

Time differences (pre- versus post) were noted for SWLS, depression and anxiety (p < 0.05) in the peer-taught participants

No differences over time were noted for the peer mentors.

**SWLS, Depression, Anxiety and Stress (Industrial Design Students):**

**Between-group difference:**
No significant differences were noted between the control and intervention groups (p > 0.05), using one-tailed independent samples t-tests and one-way between-groups analysis of covariance.

**Within-group difference:**
Comparisons were made for the experimental group across time (pre- versus post), but no significant differences were noted.

No differences over time (pre versus post) were noted for peer mentors (p > 0.05) using parametric analyses.
Of the eight included studies, one study was conducted in a secondary school population (329), and the other seven studies were conducted in tertiary institutions. The secondary and tertiary findings will be discussed separately. The methodologies of the seven tertiary studies in this review include five individual randomised controlled trials (316, 339, 348, 364, 366) and two controlled trials (365, 367). One of the studies used wait-list controls (364) and one used a historical control group (367). The five remaining studies used designs that involved control groups and intervention groups running in parallel, two of which were two-arm trials with no intervention in the control group (316, 365) and one which was a three-arm trial comparing two different interventions versus control (366). Of the two remaining parallel studies, one of them compared the same intervention delivered by faculty leaders and by peer leaders (339), and one compared the same intervention delivered to students in different faculties each with its own control group (348). The one study that was conducted in secondary schools used a two-arm cluster randomised controlled design, with control and intervention schools (329).

Of the tertiary institution studies, three of the included studies were carried out in the US (339, 364, 366), two in the UK (365, 367), one in Canada (316) and one in Australia (348). The majority of the tertiary studies were conducted with first year students, with only one of them using students in a more senior year (365), and more than half of them used psychology students as their only participant group (316, 364, 365, 367).

### 4.4.3 Study Interventions and Outcomes

The peer-led interventions in the included studies covered a wide range of approaches. The majority used peer leaders to provide support or tuition face-to-face with individuals or
groups of students. However, one intervention involved anonymous e-mail mentoring (367). The secondary school study used texting and social media to spread help-seeking messages (329). The content of the tertiary institute interventions focussed on the acquisition of knowledge and skills or the exploration of attitudes regarding stress management, help-seeking behaviour, and social and academic pressures. Several of the interventions placed emphasis on the development and maintenance of healthy connections with others (316, 339, 367). One of the interventions had a more academic focus, but an improvement in the health and wellbeing of students appeared to be a by-product of participation in the peer-led tutorial group (348). The secondary school intervention aimed to change the schools ‘norms’ by changing perceptions and behaviour regarding suicide and seeking (329).

“Mental Health and Wellbeing” is a broad concept, and consequently study outcomes were measured using a variety of tools. This lack of homogeneity of instruments impacted on the way in which the evidence could be summarised. Nonetheless, some conclusions regarding outcomes could be drawn. Several of the tertiary institute studies measured stress or distress. Two of these studies showed that peer-led initiatives appeared to be protective in terms of preventing the development of an increasing heart rate and psychological distress (364, 365), and one study showed that the intervention reduced stress levels in students from particular faculties but not from others (348). Two studies showed no difference in perceived stress levels between the control and intervention groups (316, 339). The secondary school study measured help-seeking behaviour, attitudes to help-seeking and suicide, suicidal ideation and use of coping resources (329).
In terms of depression and anxiety, one study measured anxiety and depression (348), two studies measured only depression (366, 367) and one study, only anxiety (364). One peer-led initiative was found to be protective in the development of anxiety (364), while another study showed that the intervention reduced levels of anxiety and depression in students from some faculties but not from others (348). In the other studies that examined depression, one showed significantly reduced depression scores for women in the intervention group but not for men (316), and the other study showed no differences in depression scores between the control and intervention groups (366). However, this latter study only compared post-test scores, and was conducted in a very specific sub-group of students, so the findings may not be generalisable.

Several tertiary institute studies used measures to assess differences in levels of social functioning and satisfaction between the control and intervention groups. One study demonstrated increased social support scores from women in the intervention group but not from men (316), and another study comparing the provision of social support by faculty members or peers, showed significantly higher scores in the faculty-supported group (339). Students in intervention groups showed better adjustment to university (316) and higher levels of satisfaction with the university (367), but they did not have significantly higher scores on self-esteem when compared with the control group (367).

The secondary school study measured help-seeking behaviour, attitudes to help-seeking and suicide, suicidal ideation and use of coping resources (329). The study had a robust design and large participant numbers and clearly demonstrated significant changes with an increased referral rate of suicidal peers to adults by over four times in the intervention group, along with the perception of an increased level of support by peers. Furthermore students in the
intervention group had higher expectations that adults at school would help students, and the largest improvement in change of expectations of help was in students who had a history of suicidal ideation. Suicidal ideation was decreased in the intervention group, but this did not reach statistical significance, and there was no demonstrable difference between the intervention and control groups in terms of use of coping resources.

Tertiary peer-led initiatives also showed significant results in terms of decreasing students’ scores on a personal problems inventory (365), depression, anxiety and satisfaction with life (348). Measurements of perceived stress-related physical problems were lower in the intervention group, although this only approached significance (364). No significant differences were found between the control and intervention groups when comparing scores from tools that measured loneliness, marital satisfaction, or self-esteem (316, 366, 367).

All of the above studies measured outcomes in a student group participating in a peer-led intervention. One of the tertiary institute studies also measured outcomes in the peer leaders themselves, pre and post-intervention (348). This demonstrated no change in the peer leaders in measures of depression, anxiety, stress or satisfaction with life (348). The secondary school study also measured peer leader outcomes, and showed improvements in the peer leader group in many areas; for instance higher scores on overcoming secrecy barriers, increased use of resources, higher expectations that the school would help students, and decreased maladaptive coping attitudes (329).

**4.4.4 Methodological Quality**

Figure 4.3 presents a summary of the critical appraisal of included studies, followed by a discussion of their strengths and weaknesses.
**Figure 4.3 Critical Appraisal of Studies included in the Systematic Review**

<table>
<thead>
<tr>
<th>Study/ Author</th>
<th>Title and abstract</th>
<th>Background</th>
<th>Participants</th>
<th>Interventions</th>
<th>Objectives</th>
<th>Outcomes</th>
<th>Sample size</th>
<th>Randomisation - sequence allocation</th>
<th>Allocation concealment</th>
<th>Implementation</th>
<th>Blinding</th>
<th>Statistical methods</th>
<th>Participant flow</th>
<th>Implementation of intervention</th>
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<th>Baseline data</th>
<th>Numbers analysis</th>
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* The CONSORT extension for Non-Pharmacological Treatments was used as the grading tool: scores are out of 2 for each category (0=not met at all, 1=partially met or 2=completely met). The total score is out of 46.

The large cluster randomised controlled trial conducted in secondary schools by Wyman et al was the most robust study in the review (329). The choice of a cluster randomised controlled trial design reduced the risk of contamination between the control and intervention groups, and the study ran the intervention and control groups in eighteen different high schools,
which also ensured a large number of participants spread over a wide geographical area. This study provided strong evidence that a peer-led programme can be effective in a secondary school in improving help-seeking behaviour and attitudes in secondary school students, and in fact demonstrated an increased referral rate in this sample.

Several of the tertiary institute studies had less robust designs or did not use randomisation, which limited the internal validity of findings (365). Most had small participant numbers, several had high attrition rates (366, 367), and many were conducted with a sample consisting of a very specific group of students, so external validity was also limited. For instance in one study the intervention group participants were Psychology students who had selected an option to study peer coaching (365), and in another they were Baptist students who were married (366). Other study samples had a gender imbalance (365, 367). This limited the conclusions that could be drawn about tertiary students as the findings could not necessarily be applied to the general student population.

The control groups in some of the tertiary institute studies were adequate, whereas those used in other studies did not necessarily reflect a true comparison. For example, in Short’s study with Psychology students studying coaching, the control group was made up of the students who had not been motivated to pick the coaching option (365). In another study the historical control group was from the previous academic year, where any differences in the health and wellbeing scores could also have been influenced by environmental factors occurring at that time (367). Xenos’s study design, which allocated a control group from each faculty alongside the intervention group from the same faculty, went some way towards addressing this issue (348).
The outcome measures used by the studies had strengths and weaknesses. Many of the tertiary institute studies did in fact use tools that had been previously validated (316, 339, 348, 365, 366), although two of the tertiary studies (364, 367) and the secondary school study (329) also used their own instruments that had not been validated previously. Furthermore, all of the studies used self-report tools, creating a subjective element to the scores entered on the questionnaires.

4.4.5 Strength of the Evidence

The National Health and Medical Research Council (NHMRC) in Australia have developed recommendations for grading evidence (368). The purpose of these recommendations was to assist with the development of clinical guidelines by providing a standardised way of reporting levels of evidence by using a grading hierarchy.

Using these guidelines, the strength of the evidence for the effectiveness of peer-led interventions to improve mental health and wellbeing in secondary students, would be classified as “good” as defined by the ‘body of evidence’ matrix. To meet this grading level, the criteria to be met are the level of evidence-base (one or two RCT’s with low risk of bias), that most studies are consistent, that there could be a substantial clinical impact, that the population in the studies is similar to the target population, and that the studies are applicable to an Australian healthcare context. Although only one secondary school trial was included in the candidate’s systematic review, it was a high quality study which showed significant improvement in several outcomes, and it would meet four of the NHMRC criteria for this level. The statement ‘most studies are consistent’ would be marked as ‘not applicable’.
The strength of the evidence for the effectiveness of peer-led interventions to improve mental health and wellbeing in tertiary students would be classified as “satisfactory” as defined by the NHMRC guidelines. This is because the quality of the studies was mixed and so the strength of the evidence would be classified as ‘level III-2’ or lower, there was some inconsistency between the studies, and the population studied was slightly different to the target population but it still was clinically appropriate to apply the evidence to the target group.

4.5 Systematic Review Discussion:

Table 4.3: Main Findings of Systematic Review

<table>
<thead>
<tr>
<th>Research Question</th>
<th>Key Findings</th>
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<tbody>
<tr>
<td>What is the current evidence for the effectiveness of peer-led interventions in improving the mental health and wellbeing in secondary and tertiary students?</td>
<td>The evidence in secondary students was good (as defined by NHMRC criteria). This was based on one cluster RCT. The evidence in tertiary students was satisfactory (as defined by NHMRC criteria), as the quality of the studies was mixed.</td>
</tr>
</tbody>
</table>

This systematic review shows that three of the seven studies conducted in tertiary students found significantly improved outcomes using peer-based interventions compared with a control group (316, 364, 367). The improved outcomes in peer-led participants were: reduced heart rate and state anxiety (364), increased social integration (367), improved adjustment to university (316) and a decreased likelihood of missing University classes (316). One of these
three studies showed reduced depression scores and increased social support scores in women, but not in men (316). One other study showed positive findings with the control group showing a significant deterioration in psychological distress from baseline, and the intervention group showing no significant deterioration from baseline (365). One study did show a negative finding, with higher levels of ‘perceived social support from a mentor’ in the control group (faculty-mentored), when compared the intervention group (peer-mentored) (339). The one secondary school study showed an improvement in norms regarding the acceptability of seeking help and an increased perception that help was available (316, 329).

The studies in this review have focussed only on the health of the peer-led participants. Additional findings in Wyman’s secondary school study also show the effectiveness of peer-led interventions on the peer leaders themselves (329). All nine of the outcomes measured were found to be significantly improved in the peer leader intervention group when compared with the control group. This finding is relevant to this discussion, as many of these improved outcomes in the peer leaders could also have benefits for the peer-led participants. One of Wyman’s most important findings was an increased referral of distressed peers to adults because of suicide concerns, and that this referral rate was 4.12 times higher in the intervention schools when compared to the control schools. There is evidence in the wider literature that supports this finding, and it is clear that peer-led programmes can also have significant benefits for the peer leaders themselves during the training process (340) and the delivery of the intervention in terms of assisting with their own wellbeing or attitudinal shift (369, 370). Therefore this systematic review provides moderate support for the thesis proposal that students can be empowered to improve their mental health.
4.5.1 Strengths and Limitations of the Systematic Review

One of the strengths of this systematic review is that an extensive number of search terms with multiple synonyms were used in order to ensure all trials of peer-led initiatives were identified. This resulted initially in a large number of articles being retrieved, and an extensive screening process was undertaken in order to reach the final eight studies that were selected for inclusion. Such a thorough approach helps to increase the likelihood of an exhaustive review of the available evidence.

A further strength of the review is that the critical appraisal was performed using an internationally endorsed check-list (CONSORT), which was specifically developed as a resource to outline recommendations for the reporting of randomised trials and can also be uses as a tool to aid quality appraisal (358). Furthermore, one of the CONSORT extensions specifically focuses on issues of relevance to the reporting of trials with non-pharmacologic treatment, as was the focus of this review of peer-led initiatives (356). The critical appraisal was performed by the candidate and the candidate’s two supervisors independently in order to reduce bias.

There are several limitations of this review. The multiplicity of terms used to describe peer-led interventions provided a challenge to database searching, and it is probable that despite the extensive screening process, some studies may not have been picked up. In addition to this, only four databases were searched, and the decision to limit the review to studies that included a control group resulted in the exclusion of many studies. In addition, studies not published in English and documents or theses that had not been published at all, may have been missed. Furthermore, the definition of what would be defined as ‘a peer-led
programme’ was arbitrary and it was common to find that some initiatives contained elements of peer involvement but were partially adult-led. In such cases, it may not have been possible to distinguish how much of the effectiveness of a programme could be attributed to any peer-led component.

The studies included in this review were either undertaken in secondary schools or in tertiary institutions. Although lessons learned from the secondary school environment may be applicable to a tertiary context, the candidate is aware that although similar in some respects, these are two different populations. Accordingly, it may not be possible to assume that an intervention that has been shown to be effective in a secondary school will also be effective in a tertiary institution. Furthermore, four of the tertiary institute studies were conducted with Psychology students, who may have a different level of interest or motivation about a mental health intervention than students who are studying other subjects, as mental health is the area of the discipline they have chosen to study. Therefore the results may not be generalisable to other student groups. Lastly, this systematic review combined the results of the studies qualitatively as heterogeneity of the study designs, study populations and outcome measures used, precluded quantitative synthesis in a meta-analysis.

4.5.2 Comparison with the Literature

The finding that peer-led initiatives can be effective in secondary and tertiary student populations is supported by other literature in the field. Peer support programmes have been shown to be effective in the prevention or treatment of eating disorders (126, 371-373), alcohol and drug problems (374) and anxiety (375) in student populations in secondary and tertiary institutions and to enhance suicide intervention responses (376) (377). Peer support
has also been identified as a protective factor for depression in tertiary students in a study that examined the counterbalancing effect of protective factors to risk factors for depression (127). The concerns of peers have been shown to be a predictor of help-seeking for depression (328) and to increase the uptake of self-care resources (378). Such interventions can be effective early interventions that provide a mechanism for referral and changing the culture to de-stigmatise and improve help-seeking behaviour. Peer-led programmes have also been shown to be effective in the provision of education about physical health, for example by leading to an increase in help-seeking for diet, exercise and safe sex (379).

It has been also been demonstrated that tertiary students are able to appropriately identify different levels of stress in their peers and can correctly identify presentations of those most at risk (380). Moreover, students who have a history of past suicidal behaviour themselves are even more likely to recognise and respond to peer-distress than those without such a history (381). The literature provides many examples of peer leader training programmes, with guidelines and recommendations for implementing and evaluating them (382-386).

One of the articles in the candidate’s systematic review showed that a faculty-led programme was rated more highly in terms of the provision of support than a peer-led programme (339). There is no comparable study to be found in the literature to comment on this finding. There are a few studies in the wider literature which suggest that a peer support programme may not be effective in terms of improving psychological wellbeing in students, but these are in the minority (338, 387).

The most robust study in the candidate’s review, by Wyman, was conducted at the population health level rather than at the individual level and therefore the intervention was
designed to be applied to the whole school population, rather than being targeted at those who were high risk or those who elected to participate in a study (329). The results indicate that the approach appeared to be successful in that the referral rate for students with suicidal thoughts was increased by over four times, and the students reported a significantly higher increase in the acceptability of seeking help when compared to students in the control schools. This is consistent with previous findings in the literature, which demonstrate that the concerns of peers are one of the predictors of seeking help, along with the concerns of a teacher or mother (328).

It is interesting that Wyman’s 2010 study shows that a peer-led population health method is successful with students (329), as this approach is consistent with the recommendations for health initiatives in young people outlined by the New Zealand government ten years ago (59). The Youth Development Strategy Aotearoa, developed by the Ministry of Youth Development in New Zealand, was focussed on people aged between 12 and 24, and outlined the key principles known to be effective for the healthy development of young people. These principles are all evident in Wyman’s study: the influence of social and cultural trends, the meaningful involvement of young people in the development and delivery of the programme, the enhancement of protective factors, the promotion of healthy connections with other people, and the provision of helpful information. An educational environment provides a medium for the introduction and enhancement of such principles, and is an opportunity to embed them into the culture of the institution. Furthermore, Wyman’s design also incorporates the use of messaging and social networking, which has been suggested is an effective, acceptable and sustainable way of providing peer support in the current economic
climate where many educational institutions face funding challenges and resource constraints (388).

This review has focussed on interventions involving the general student body rather than those which only included students who were unwell. Within these ‘general’ groups, participants will exhibit a spectrum of mental health, ranging from those who are unwell or have poor quality of life, to those who are currently feeling well. Interventions targeted at the ‘well’ end of the spectrum could be viewed as mental health promotion, moving through illness prevention, towards the other end of the spectrum where the focus would be more on the treatment of illness. Including the whole spectrum of the student population in a study can create some challenges to the research in terms of measuring levels of mental health and also in showing statistically significant changes in quantitative mental health measures. A population in a non-clinical setting will have a lower prevalence of illness than within a healthcare setting, and therefore the study would need larger participant numbers to demonstrate that an intervention was effective then if the study population had higher prevalence of mental illness at baseline. For the people who already have good mental health at the start of the study, it is harder to demonstrate any measureable improvement in their mental health or quality of life. Added to this is the possibility that a participant group who are largely well may be less motivated to adhere to an intervention protocol.

4.5.3 Conclusions and Implications for Future Research, Practice and Policy

Further research into the effectiveness of peer-led initiatives with a specific focus on tertiary organisations is needed as there are few high quality trials in this setting. Ideally trials of effectiveness of peer-led interventions would be conducted with a large sample size taken
from a main-stream tertiary population defined only by its institutional membership to improve generalizability of its findings. Additionally, future research could incorporate standardised and validated follow up measures into the research design in order to allow quantitative synthesis of the results of effectiveness. Deciding on standardised outcome measures is outside the scope of this discussion, but future consensus on appropriate outcomes for measuring student mental wellbeing and ill-health are needed.

The one study in this review that did use a large sample size from a general secondary school student population demonstrated the success of this methodology and showed significant improvements in the students’ help-seeking behaviour and an increased rate of referral for students with suicidal thoughts (329). It is possible that it was the population-level approach in this study that was successful, it may have been the fact that it was conducted with secondary school participants, or it could have been the peer leadership and modelling itself that was the vital element. Future research could address whether it is in fact the peer component that is effective by comparing identical interventions led by Faculty and led by peers, in a replication of Pfister’s study (339) on a larger scale in a mainstream student population.

From the evidence presented in the studies, it seems clear that students are capable of delivering interventions to their peers effectively in terms of improving or protecting some aspects of their mental health and wellbeing. However, this conclusion is based on the appraisal of a small number of studies, for although a large number of articles were initially screened, only eight studies were included in the review. This paucity of evidence could reflect the fact that this is a relatively unexplored research area or it could highlight the challenges of using quantitative methodology, in particular comparative trials, to answer this
question. The studies undertaken to date that focus on peer-led interventions for mental health and wellbeing in students are a disparate group that include a wide range of interventions and designs. These commonly consist of qualitative participant self-evaluations, or before and after studies with no control group (389, 390). This could reflect the difficulty of conducting controlled trials within institutions that may also be constrained by curricular requirements, or affected by contamination between groups.

Therefore, this systematic review, which excludes studies without a control group, would have omitted much of the work that has been carried out in this area. Thus although randomised controlled trials may provide the best evidence in terms of effectiveness, a future review of peer-led initiatives may be wise to include evidence from a broader range of study designs. Some observational studies that have been undertaken did draw conclusions about promising interventions that show some potential or highlight avenues for possible future research (343, 391-393).

There have been some studies of peer-led interventions in medical students. Redwood and Pollak noted that the medical undergraduate stress-management programmes in Shapiro’s review were mainly led by health professionals and also involved low numbers of students (177, 390). This led them to develop and evaluate a student-led programme that involved 1111 students over a period of 16 years. The outcomes measured in this study consisted of qualitative self-evaluations, and did not involve quantitative measures to assess effectiveness. Therefore in the candidate’s view, the study did not add to the strength of the evidence for peer-led interventions for mental health. However, Redwood and Pollak’s study concluded with a set of specific recommendations for future peer-led interventions in medical schools, one of which was the importance of aligning or including the intervention with the
This is supported by recent studies conducted with medical students from New Zealand and Australia, which showed that most students would like to learn skills to assist their peers in distress, and that they would prefer to do this as part of the curriculum (190, 394).

Lastly, it is possible that engaging and empowering students of all ages may be beneficial in terms of improving their peers’ health, as a meta-analysis of 120 studies looking at programmes for reducing alcohol, tobacco and other drug use in middle-school students concluded that peer-led interventions were superior to staff-led programmes (342).

This chapter described a systematic review to determine the current level of effectiveness of peer-led interventions in improving the mental health and quality of life in secondary and tertiary students. Although the evidence for the effectiveness of peer-led interventions for mental health and wellbeing in students is moderate, only a small number of trials have been performed, and more randomised controlled trials are needed. The next chapter describes a pilot study and randomised controlled trial of a peer-led intervention in a population of medical students conducted by the candidate.
5 The Peer Intervention Trials

“I approached her and I was trying to normalise everything as much as possible, and reiterating that if I could offer support or help in anyway then that would be great, and that I hope if I was ever in a down space that someone in our class would do the same.......She later sent me an email which included “It took a lot of courage and genuinely kind concern from you for you to approach me. It meant a lot that you were tactful but honest about how you and people are seeing things, and it’s good to know people care” and an invitation to have coffee together...”

Medical student peer leader (on approaching another student who appeared to be unwell)

5.1 Introduction

The rationale for peer-led interventions was outlined in the previous chapter. It stated that participants in the CALM study requested more personal support, that the majority of students do not approach professional services for help but will commonly speak to a peer in times of distress, and that peer leader programmes have been successful in enhancing help-seeking behaviour. The candidate’s systematic review of peer-led interventions showed that there is moderate evidence for their effectiveness in improving mental health and wellbeing in the student population, but identified a need for further randomised controlled trials. The current chapter describes a pilot study to assess the feasibility of three different peer-led interventions and to test research processes. The pilot study was used to inform the second peer-intervention study, a randomised controlled trial, which is also reported in this chapter. The two peer-led studies will be referred to as ‘The Pilot Study’ and “The Randomised
Controlled Trial’ or ‘RCT’ throughout this chapter. The term, “The Peer Intervention Trials”, will be used to refer to both of these studies together.

5.2 Pilot Study Aims

The aim of this study was to assess the acceptability and feasibility of three different peer-led interventions in a group of medical students over an eight week period. The interventions used were peer-taught mindfulness, peer support and a combination of both peer-taught mindfulness and peer support. The intervention involved students meeting with a peer leader, or with peers in small groups, which introduced an element of social support. The study also aimed to test the feasibility of the randomisation process, data collection and anonymous linking, and the use of questionnaires to assess risk of depression and anxiety, quality of life and help-seeking behaviour for use in a subsequent longer trial. Lastly it aimed to describe the experiences of being a peer leader and of being taught or supported by a peer.

5.3 Pilot Study Methods

5.3.1 Pilot Study Research Questions

- What is the feasibility and acceptability of three different peer-led interventions to improve mental health and quality of life in medical students?

- What is the experience of being a peer leader and of being a peer-led participant?

5.3.2 Study Design

The study used mixed methods and employed quantitative and qualitative analyses. Four randomly allocated groups were used in the pilot to assess the feasibility of using peer
support, peer-taught mindfulness or both versus control, to define the subsequent intervention of a proposed two-arm randomised controlled trial.

5.3.3 Study Population

The study population included medical students in Year 3 at the University of Auckland in 2010.

5.3.4 Participant Recruitment

The candidate firstly consulted with the Year 3 student representative to discuss the best approach to take during a short presentation to the students. The student representative suggested statements that could enhance student interest in the study, which are outlined in Table 5.1.
Table 5.1 Student Representative Recommendations to Enhance Participant Interest during Recruitment

<table>
<thead>
<tr>
<th>Describe the study clearly and emphasize its importance:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Why the study is unique</td>
</tr>
<tr>
<td>• What difference the research could make by outlining who could benefit from it</td>
</tr>
<tr>
<td>• Why you need participants from that year of medical students</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Act like the research and the researcher are important:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Dress smartly</td>
</tr>
<tr>
<td>• Speak with conviction and passion</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Outline the benefits for participants:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• What new skills participants may learn</td>
</tr>
<tr>
<td>• What participants could put on a curriculum vitae</td>
</tr>
<tr>
<td>• Details of vouchers for participation</td>
</tr>
<tr>
<td>• Details of catering to be provided</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Outline the commitment required of participants:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• The exact time requirement</td>
</tr>
<tr>
<td>• How participation in the study will fit into the semester time-frame with regard to assignments and exams</td>
</tr>
</tbody>
</table>

Using the above guidelines, the candidate spoke to the Year 3 students about the study at the end of a lecture and handed out study information sheets. (Appendix 8) Interested students were asked to attend a data collection and randomisation meeting, scheduled to follow directly after the presentation. Participants were selected by convenience sampling, with ‘participant packs’ being handed out to the first students to attend the meeting. The number of students recruited was capped to enable optimal group size. The candidate presented information to the participants regarding the expected role of the peer group leaders, the purposes of the different intervention groups, and the procedure for filling in consent forms.
and questionnaires (Appendices 7 and 11). Written instructions about this procedure were also projected onto screens at the front of the lecture theatre.

Each participant pack consisted of a consent form attached to a questionnaire, both of which contained the same participant identifying number (PIN). At the back of the pack there was a randomisation envelope, and instructions were given that these envelopes were not to be opened until advised. Participating students were asked to enter their name and contact details on the consent form and then to tear it off and hand it in separately from the questionnaire, which contained only the PIN. They then completed the baseline questionnaire, which took approximately fifteen minutes. Once all of the questionnaires had been collected, the students were asked to open their randomisation envelopes, and refreshments were served.

5.3.5 Randomisation Procedure and Peer Leader Selection

Study participants were randomly assigned into four groups using a computer-generated random sequence undertaken by a researcher not involved in data collection. Opaque sealed envelopes, containing the letters A, B, C or D representing allocation of randomisation, were opened after questionnaire completion, and participants were instructed to form four groups according to their allocated letter. Once they were in these groups they were told which intervention had been assigned to which group. The interventions for the four groups had been informed by the literature review and the systematic review.
The four groups were as follows:

A. Control Group (CG): access to CALM website (available to all class members)

B. Mindfulness Only Group (MOG): peer-taught mindfulness led by two student leaders

C. Support Only Group (SOG): peer support led by two student leaders

D. Support and Mindfulness Group (SAMG): peer-taught mindfulness and peer support led by two student leaders

Participants in the control group were then free to leave the meeting. The remaining three groups of students were each asked to select two peer leaders. Two of the groups did this by asking for volunteers and then selecting the first two students who offered to take on the role. The third group asked for all the names of those who were interested in being considered for a leader’s role, and the group then voted for their preferred people. Once elected, the peer leaders recorded the names and contact details of the participants in their group.

Participants who attended the baseline and randomisation meeting were reimbursed for their time by each receiving a $20 voucher (for mobile phone calls, food or petrol). Participants selected as peer leaders were asked to give additional time by attending the peer leader training programme and then delivering the intervention. They received a further $40 voucher after completion of training.
5.3.6 Outcome Measures

5.3.6.1 Quantitative Assessment

Measures were taken at baseline and eleven weeks later, after three weeks of peer leader training followed by eight weeks of intervention delivery. The choice of instruments was informed by the literature review. Primary outcomes included depression risk, measured by the Primary Health Questionnaire (PHQ-9) (103), and anxiety risk, measured by the Generalised Anxiety Disorder questionnaire (GAD-7) (95). The PHQ-9 and the GAD-7 are the self-report depression and anxiety modules, respectively, taken from the PRIME-MD diagnostic tool. Each of the questions from the PHQ-9 and the GAD-7 can be given a total possible score of between zero and three. The nine-item PHQ-9 therefore has a possible total score of 27, and the GAD-7 has a possible total score of 21. Both of these tools have been well validated and they have described in the previous thesis chapter, The CALM Study.

The secondary outcomes included quality of life, measured by the abbreviated version of the World Health Organisation Quality Of Life questionnaire (WHOQOL-BREF), and help-seeking behaviour, measured by the Emotional Competence Questionnaire (395). The secondary outcome measures are described in more detail below.

The World Health Organisation Quality of Life questionnaire (WHOQOL-100) was developed in 1994 (396). The development process was extremely thorough, and consisted of fifteen different international centres concurrently creating a quality of life assessment tool, pooling the results to create a 236-item tool, piloting this tool, and then selecting 100 items for inclusion in the WHOQOL-100. This development process was undertaken to ensure that the final instrument would be of relevance to many cultures. In 1998, the WHOQOL group
developed an abbreviated version, the WHOQOL-BREF (397). The WHOQOL-BREF is a twenty-six item tool, which is grouped into four domains: psychological, physical, social-relational and environmental. Criterion-related validity was confirmed for the WHOQOL-BREF by comparison with the WHOQOL-100, and there were high correlations between the domain scores (397). The WHOQOL-BREF has been validated in a population of New Zealand medical students (30, 398).

The Emotional Competence Questionnaire (ECQ) was developed as an instrument to measure the beliefs of medical students about their own emotional competence (395). A 37-item questionnaire was developed, informed by the literature and small group discussions with groups of medical students and doctors. The questionnaire was then piloted on a group of 80 Year 4 students from a New Zealand medical school. Principal component analysis was used to establish subscales, one of which was called “Support Seeking”. The support seeking sub-construct was shown to have good internal consistency, with a Cronbach alpha score of 0.79 (395). This module from the ECQ was used in the candidate’s pilot study and was named ‘The Help-seeking Questionnaire’.

5.3.6.1.1 Instrument Reliability

The reliability of the PHQ-9, GAD-7, WHOQOL-BREF, and Help-seeking questionnaires was assessed in the current study by checking the internal consistency of the tools. A test of homogeneity can be used to assess the reliability of a questionnaire, by assessing whether the individual questions are measuring the same construct (399). This is estimated via the coefficient alpha index, which assesses each item in reference to the total questionnaire score. This method is a way of checking the internal consistency of a questionnaire in a
sample, without having to take a series of measurements over multiple time periods. The four questionnaires used in the pilot study were therefore checked for reliability, including each of the four domains for the WHOQOL. The questionnaire scores collected as baseline measures were used to calculate the Cronbach alpha scores.

5.3.6.2 Qualitative Assessment:

Two open-ended questions were included in the follow-up questionnaire: “Do you have any questions about the assessment?” and “Do you have any comments about the study?” In addition, two focus groups were held following completion of the pilot, one for the peer-led participants and one for the peer leaders. Convenience sampling was used to select the members for the peer-led participant focus group. For the peer leader focus group, purposive sampling was used, and all six peer leaders were invited to attend. Semi-structured interview schedules were used, notes were taken during the focus group and themes identified. Thematic analysis was undertaken using a general inductive approach (276) to identify themes describing the experience of being a peer-leader and of being in a peer-group. Suggestions for improvement were taken into account when fine-tuning the intervention for the subsequent RCT.

5.3.6.3 Additional Feasibility Data

As part of the development of the RCT, the candidate wished to seek participant opinion about whether peer leaders should be selected from the same class or from a more senior class. Therefore, a further question was added to the pilot study final questionnaire. There is no conclusive evidence in the literature regarding the appointment of peer leaders in terms of their recommended seniority in relation to the peers they will be supporting. Redwood and
Pollak stated that they had found it feasible to use peer leaders who were one year senior to the participants, but they did not do a comparison with peer leaders of a different level of seniority (390). Therefore it is currently unclear whether same-age peers or older peers would be more acceptable to a student group. In the absence of recommendations from the literature, the candidate asked the question:

“If you had a student leader providing peer-support, would you prefer if they were from:

- The same year as you
- The year above you
- Either
- Other (please comment)

5.3.7 Interventions and Control

5.3.7.1 Intervention Timetable

There was a preparatory phase to the intervention, which consisted of a period of training for the peer leaders. Once the training had been completed, the peer leaders delivered the intervention to the peer-led participants. As recommended in the literature (390), the intervention was timed to fit around the students’ academic year (Table 5.2).
### Table 5.2: Semester Timetable Incorporating the Intervention Processes

<table>
<thead>
<tr>
<th>Weeks from Start of Academic Year</th>
<th>Student Academic Timetable</th>
<th>Intervention Processes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Preparatory Phase: Peer Leader Training</td>
</tr>
<tr>
<td>Weeks 3-5</td>
<td>Peer leader training completed 4 sessions (10-11 hours)</td>
<td>Intervention commenced: Peer-led mindfulness Session 1 Peer support provided</td>
</tr>
<tr>
<td>Week 6</td>
<td>Student test</td>
<td>Peer support provided</td>
</tr>
<tr>
<td>Weeks 7-8</td>
<td>Mid-semester break</td>
<td>Peer support provided</td>
</tr>
<tr>
<td>Week 9</td>
<td>Student test</td>
<td>Peer-led mindfulness Session 2</td>
</tr>
<tr>
<td>Week 10</td>
<td></td>
<td>Peer support provided</td>
</tr>
<tr>
<td>Week 11</td>
<td></td>
<td>Peer support provided</td>
</tr>
<tr>
<td>Week 12</td>
<td>Assignments due</td>
<td>Peer-led mindfulness Session 3 Intervention Delivery finished</td>
</tr>
<tr>
<td>Week 15</td>
<td>Exams, end Semester</td>
<td></td>
</tr>
</tbody>
</table>

### 5.3.7.2 Intervention Development

The candidate designed a peer-led intervention comprising several components found to be effective in the promotion of good mental health in students, including peer support, peer-teaching and social support (352, 390). Peer-led mindfulness was chosen as the peer-taught topic, due to the research showing the benefits of mindfulness for good mental health in medical students (230-232). These peer-led mindfulness and peer support intervention components will be described in more detail below, following the description of the peer leader training programme.

### 5.3.7.3 Preparatory Phase: Peer Leader Training

5.3.7.3.1 Facilitation of Sessions
The majority of the pilot peer leader training course was an amended version of ‘The Peer Support Training Programme’ from Oxford University (400). The remainder of the training course consisted of tuition in mindfulness. The Oxford programme is supported by a training manual, which stresses the importance of appropriate expertise for facilitators (400). The pilot peer leader training course was facilitated by the candidate, who has expertise in teaching of communication skills, mental health and mindfulness. The session on ‘Crisis and Suicide’ was co-facilitated by the candidate and by an experienced counsellor from The University of Auckland Health Service.

5.3.7.3.2 Schedule of Training Sessions

The peer leader face-to-face training was originally scheduled to take place over ten hours in extra-curricular time, at times and on dates that were convenient to the peer leaders (390). The peer leaders wished to complete the training within two and a half weeks in order to fit in with the medical student revue and a class test, and therefore the face-to-face schedule was adapted to fit into a nine-hour time-frame. In addition to this, some of the peer leaders were also required to listen to mindfulness training CDs’ at home for a further two hours, taking the total training time to a maximum of eleven hours. Depending on which intervention group they were leading, specific peer leaders were asked to undertake particular training modules (Table 5.3).
Table 5.3: Pilot Study Peer Leader Training Schedule

<table>
<thead>
<tr>
<th>Session</th>
<th>Number of Hours</th>
<th>Training Session Topics</th>
<th>SAMG* Leaders Required</th>
<th>SOG † Leaders Required</th>
<th>MOG ¶ Leaders Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>Session 1</td>
<td>2</td>
<td>Listening skills&lt;br&gt;Advice giving and decision-making&lt;br&gt;Sharing a concern&lt;br&gt;Identifying and labelling feelings</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Session 2</td>
<td>2</td>
<td>Welcoming/unwelcoming behaviour&lt;br&gt;Confidentiality&lt;br&gt;Stereotyping exercise</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Session 3</td>
<td>3</td>
<td>Mindfulness training&lt;br&gt;Group facilitation skills&lt;br&gt;Practicalities (room bookings, equipment)&lt;br&gt;Families, Culture and Values</td>
<td>Yes (for 3hrs)</td>
<td>Yes (for 2 hrs.)</td>
<td>Yes (for 1 hr.)</td>
</tr>
<tr>
<td>‘Homework’</td>
<td>2</td>
<td>Listening to Mindfulness CDs’&lt;br&gt;‘Approaching a stranger’ exercise&lt;br&gt;Non-verbal behaviour observation and interpretations exercise&lt;br&gt;Cultural exercise</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Session 4</td>
<td>2</td>
<td>Limit setting, boundaries and assertiveness&lt;br&gt;Crisis and suicide awareness and prevention&lt;br&gt;Referral and resources</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Total Hours of Training 11 11 8 7

*SAMG: Support and Mindfulness Group; † SOG: Support Only Group; ¶ MOG: Mindfulness Only Group

5.3.7.3.3 Outline of Programme Content

The content of eight hours of the face-to-face training sessions was adapted from The Oxford Peer Support Training Manual (400), and the remaining three hours consisted of training in mindfulness. The Oxford Peer Support Training Manual is intended for training students from any discipline, and it is a thirty hour programme in total, divided into ten sessions each of three hours duration, which has been developed and fine-tuned over the last twenty years by Anne Ford, The Peer Support Programme Co-ordinator at the University of Oxford.
Counselling Service (personal communication with Anne Ford). The eight-hour content of the training programme used is briefly outlined in Table 5.3 above, and the content list of the full Oxford Programme is provided in Appendix 6. Much of the thirty-hour Oxford programme consists of basic communication skills (e.g. reflective listening, being non-judgmental, ways of asking questions and helpful non-verbal behaviour). The students in the candidate’s pilot study were at the start of the second semester of Year 3 of medical school. As such, they had already completed three semesters of communication skills training in small groups, as well as having passed a practical exam on the topic in their usual curriculum. It was thus possible to amend and condense the Oxford programme into eight hours by focusing on the parts of its content that had not previously been covered in the Auckland medical school curriculum.

The mindfulness training part of the peer-leader programme consisted of a one-hour face-to-face session, and two hours of self-directed learning done at home using a CD developed for this purpose (231). Mindfulness involves focusing one’s attention on what is happening in the present moment, and can be practiced using mindfulness meditation (401). This can involve directing attention to breathing patterns, or areas of the body, whilst at the same time noticing distracting thoughts but choosing not to focus on them. Part of mindfulness is awareness and acceptance of pleasant and unpleasant thoughts, while minimizing their impact by directing the focus elsewhere (231). The mindfulness training CD that was used in the candidate’s pilot study was created as part of the Health Enhancement Programme (HEP) for medical students at Monash University developed by Dr Craig Hassed (231). With the permission of Dr Hassed, the Monash “Stress Reduction” three-CD pack was given to the peer leaders who would be running group mindfulness sessions. This pack consisted of two
CDs’ that contained information about mindfulness and stress management, and a third CD with a variety of led mindfulness meditations.

The peer leader training programme also included a discussion about aspects of the training that could be personally challenging, and the fact that peer leaders themselves may need some support. There were no further changes to the planned content of the training programme, except the addition of assertiveness training, which was something that the students requested, as they felt it may be helpful in their role as peer leaders.

At the conclusion of the training, the peer leaders were given a resource folder. This contained information about relevant support people within The University of Auckland, which was consistent with guidelines handed to all Year 3 students at the start of the year. It also contained updated information about the student counselling service, and details about several other services outside the University that could be contacted to provide assistance with mental health. Phone numbers were provided for all services including 24-hour contact numbers, information about text and e-mail counselling and websites, and the phone numbers of the training facilitators.

5.3.7.4 Peer-Taught Mindfulness Component

Two of the intervention groups (MOG and SAMG) involved participation in group mindfulness sessions. The leaders of these groups were asked to organise three thirty-minute mindfulness sessions throughout the remainder of the semester. The organisational arrangements required to run the groups were the responsibility of the peer group leaders, the only stipulation being that they were asked to book a room in the medical school. This was so that they could run their group in a neutral venue associated with learning, rather than at one
of their own homes. This venue requirement was put in place in order to ensure a more professional atmosphere and to avoid possible blurring of boundaries between the provision of peer-taught mindfulness and informal socialising. In the first meeting, the leader was asked to teach the group about mindfulness, to include a group practice of a mindfulness exercise using a recorded mindfulness soundtrack, and to hand out diaries to the group participants and discuss with them the possibility of practicing mindfulness at home and keeping a record of this. In subsequent meetings, the leader was asked to answer any questions about mindfulness, to run a mindfulness exercise using the CD soundtrack, and to give the students an opportunity to discuss any issues regarding mindfulness practice.

5.3.7.5 Peer Support Component

The leaders for two of the intervention groups (SAMG and SOG), were asked to provide peer support for their group members. This involved having an introductory meeting to discuss their leader role including confidentiality and boundaries, and to explain that they were familiar with student counselling services along with other support services. They asked the students in their group to contact them if they had any issues they wished to discuss on a one to one basis, should the need arise. They also made sure that they had the contact details of all of the students in their group, and let them know that they would send out a group e-mail every three weeks. The purpose of this e-mail was to remind the students that the leader was available to provide support if required, and to provide information about services. Apart from the initial introductory meeting, no regular meetings were arranged as part of the peer support intervention component.
During discussions in the peer leader training sessions, the leaders decided that they would much prefer to offer to provide peer support as a panel, i.e. that any of the students in the peer support arms of the trial, could approach any of the peer support leaders, rather than having one designated leader. This meant that four peer leaders would provide support for approximately forty peer-led participants in the groups SOG and SAMG.

5.3.7.6 Treatment as Usual (Control Group)

The control group were able to access the usual support systems available to all medical students at the University. These included the Student Counselling Service, pastoral care provided by an academic staff member, and the CALM website, the self-care resource co-developed by the candidate in the preliminary stages of this work. The students were given this information as part of their orientation to medical school at the start of the year, and they were reminded about it in a ‘Healthy Students’ seminar early in the first Semester. No specific reminders were given about this at any point during the trial.

5.3.8 Safety Considerations for the Peer Intervention Trials

As the peer intervention trials were in the area of mental health, it was vital to ensure the safety of all peer-led study participants, along with providing supervision, support and oversight of the peer leaders. In the interests of safety, the peer leaders were asked to support any student who approached them for help, regardless of whether that particular student had been assigned to an intervention group or to the control group, but to keep a record of the assigned groups for all students who consulted them.

The peer leaders were instructed to contact student health services with regard to concerns about the mental health of any student in their group. If the peer leaders found that their own
emotional state had been affected by their interactions with students, then they would be expected to approach a counsellor and to speak about this in their supervision session. One of the counsellors from the student health service worked as a co-facilitator to provide training for the final peer leader training session. This ensured that all of the peer leaders had met the counsellor, and that they knew that she was aware of the project and was supportive. The peer support leaders were given written information about appropriate referral services including after-hours mental health services. They were also advised to phone the supervising counsellor at any time on her mobile phone.

During peer leader training, all of the leaders were required to attend the session on ‘Crisis, Suicide, Referral and Boundaries’ regardless of their assigned intervention group. This was to cover the possibility that a student could approach any of them for help, as they would be adopting a leadership role. After the completion of training, meetings were set up with the candidate, the counsellor and the peer leaders so that any issues could be discussed.

5.3.9 Data Entry and Storage for the Peer Intervention Trials:

Data were entered into an ACCESS database, which included the PIN of participants, participant demographic characteristics, scores from the questionnaires, and the qualitative participant comments. A list of PINs and identifying information was kept separate from the rest of the study data. Data from peer leaders was identified by the PINs and was excluded from the dataset. Double data entry was used for both of the peer intervention trials with the two datasets compared to ensure accurate entry of data. After data entry had been completed, the questionnaires were stored in a locked filing cabinet, and the computer files were stored on a password-protected drive. All data will be stored for six years. At the end of the
completion of the research data will be deleted and paper copies of questionnaires confidentially recycled.

5.3.10 Pilot Study Data Analysis

Only the data that was present was included in the analyses. Primary and secondary outcomes were assessed at baseline and follow up weeks by completion of questionnaire. Means and standard deviations were calculated. Cronbach alpha scores were calculated to assess the reliability or internal consistency of the questionnaires. The qualitative data was analysed using general inductive data analysis (276). This involved summarising the data by identifying the main themes, and then forming links between the data and the research questions. All analyses were conducted by the candidate.

5.4 Pilot Study Results

5.4.1 Participation Rates

Out of 175 students in Year 3, approximately 100 volunteered to participate, and the first 80 of these students to attend the recruitment meeting were enrolled. One of these 80 participants elected not to complete any questionnaires or to participate further and so the final number participating in the pilot study was 79. The participants were randomised into the four groups:

1. Group A: Control (n=19)
2. Group B: Peer-led mindfulness only (n=20)
3. Group C: Peer support only (n=20)
4. Group D: Peer-led mindfulness and peer support (n=20)
5.4.2 Baseline Characteristics and Outcome Measures

The demographic characteristics recorded included age, gender and ethnicity. The ethnicity of the participants was 43.8% NZ European, 41.1% Asian, 5.5% Maori and 5.5% Pacific and 4.1% ‘Other’. Baseline characteristics of the study participants (not including peer leaders) are presented in Table 5.4. The distribution of data was assessed by looking at the histograms for each of the outcome measures, and as these were relatively normally distributed, means and standard deviations were presented.

Table 5.4: Baseline Characteristics of Control and Intervention Groups in the Pilot Study:

<table>
<thead>
<tr>
<th>Characteristic n (%) or mean (SD)</th>
<th>Control Group A (n = 19)</th>
<th>Intervention Group B (n = 18)</th>
<th>Intervention Group C (n = 18)</th>
<th>Intervention Group D (n = 18)</th>
<th>Total Group (Control and Intervention) (n = 73)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>7 (37%)</td>
<td>12 (67%)</td>
<td>12 (67%)</td>
<td>14 (78%)</td>
<td>45 (61.6%)</td>
</tr>
<tr>
<td></td>
<td>10 (53%)</td>
<td>5 (28%)</td>
<td>5 (28%)</td>
<td>4 (22%)</td>
<td>24 (32.9%)</td>
</tr>
<tr>
<td></td>
<td>2*(10%)</td>
<td>1*(5%)</td>
<td>1*(5%)</td>
<td>4* (5.5%)</td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>23 (3.5)</td>
<td>23.6 (4.6)</td>
<td>21.7 (3.0)</td>
<td>21.7 (3.0)</td>
<td>22.4 (3.5)</td>
</tr>
<tr>
<td>PHQ-9</td>
<td>6.2 (5.9)</td>
<td>4.4 (4.1)</td>
<td>3.2 (2.0)</td>
<td>3.1 (3.8)</td>
<td>4.3 (4.3)</td>
</tr>
<tr>
<td>GAD-7</td>
<td>4.5 (3.4)</td>
<td>3.1 (3.2)</td>
<td>4.1 (3.1)</td>
<td>3.3 (2.2)</td>
<td>3.7 (3.0)</td>
</tr>
<tr>
<td>HS</td>
<td>3.4 (1.3)</td>
<td>3.4 (1.0)</td>
<td>3.2 (1.1)</td>
<td>3.4 (1.0)</td>
<td>3.4 (1.1)</td>
</tr>
<tr>
<td>WHOQOL Physical</td>
<td>3.9 (0.8)</td>
<td>4.0 (0.5)</td>
<td>4.0 (0.5)</td>
<td>4.2 (0.5)</td>
<td>4.0 (0.6)</td>
</tr>
<tr>
<td>WHOQOL Psychological</td>
<td>3.7 (0.7)</td>
<td>3.9 (0.6)</td>
<td>3.8 (0.5)</td>
<td>3.9 (0.5)</td>
<td>3.8 (0.6)</td>
</tr>
<tr>
<td>WHOQOL Social</td>
<td>3.6 (0.8)</td>
<td>3.8 (0.9)</td>
<td>3.6 (0.8)</td>
<td>3.9 (0.6)</td>
<td>3.7 (0.8)</td>
</tr>
<tr>
<td>WHOQOL Environmental</td>
<td>3.6 (0.4)</td>
<td>3.8 (0.5)</td>
<td>3.8 (0.6)</td>
<td>3.9 (0.6)</td>
<td>3.8 (0.5)</td>
</tr>
</tbody>
</table>
There were some differences between the groups in terms of baseline characteristics although the groups were small so some differences could have happened by chance. There were a higher proportion of males in the control group; whereas each of the intervention groups had two or three times more females than males. The control group also had a higher mean baseline PHQ-9 score in comparison to the intervention groups.

However no statistical tests were performed to assess difference between groups, as a randomisation procedure had been followed.

5.4.3 Instrument Reliability

Table 5.5: Reliability Check of Pilot Study Questionnaires

<table>
<thead>
<tr>
<th>Instruments</th>
<th>Cronbach Alpha Scores</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHQ-9</td>
<td>0.86</td>
</tr>
<tr>
<td>GAD-7</td>
<td>0.82</td>
</tr>
<tr>
<td>HS</td>
<td>0.78</td>
</tr>
<tr>
<td>WHOQOL Physical Domain</td>
<td>0.80</td>
</tr>
<tr>
<td>WHOQOL Psychological Domain</td>
<td>0.77</td>
</tr>
<tr>
<td>WHOQOL Social Relationships Domain</td>
<td>0.70</td>
</tr>
<tr>
<td>WHOQOL Environment Domain</td>
<td>0.70</td>
</tr>
</tbody>
</table>

PHQ-9: Primary Health Questionnaire; GAD-7: Generalised Anxiety Disorder Questionnaire; HS: Help-Seeking (Emotional Competence Questionnaire); WHOQOL: World Health Organisation Quality Of Life Questionnaire (Abbreviated version WHOQOL-BREF)
The PHQ-9, GAD-7 and WHOQOL-BREF questionnaires used in the pilot study showed good internal consistency (Table 5.5). A Cronbach alpha score of 0.7 or higher has been suggested as an appropriate cut-off point to represent good internal consistency when measuring psychological constructs (402). In other words, it is likely that the score recorded for one individual question from one of these questionnaires, will be consistent with the total questionnaire score. Therefore a total score for each questionnaire can be used in data analysis, without analysing the individual items of each questionnaire.

5.4.4 Quantitative Results

Follow up measures were collected from 67/79 participants (85% retention rate). The final results are shown in Table 5.6 below. Statistical tests have not been carried out to assess differences between groups over time as this was not the aim of the pilot study, which was not powered to assess an effect.
Table 5.6: Baseline and Follow Up Results of Participants who Completed the Pilot Study

<table>
<thead>
<tr>
<th>Outcome Measures Mean (SD)</th>
<th>Control Groups</th>
<th>Intervention Groups</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Control Group A Baseline n=16</td>
<td>Group B Baseline n=15</td>
</tr>
<tr>
<td>PHQ-9</td>
<td>6.4(6.4)</td>
<td>4.6(4.3)</td>
</tr>
<tr>
<td>GAD-7</td>
<td>4.8(3.5)</td>
<td>3.3(3.4)</td>
</tr>
<tr>
<td>HS</td>
<td>3.5(1.1)</td>
<td>3.2(1.2)</td>
</tr>
<tr>
<td>WHOQOL – PH</td>
<td>3.9(0.9)</td>
<td>4.0(0.5)</td>
</tr>
<tr>
<td>WHOQOL-PS</td>
<td>3.7(0.7)</td>
<td>3.8(0.7)</td>
</tr>
<tr>
<td>WHOQOL-SR</td>
<td>3.5(0.9)</td>
<td>3.6(1.1)</td>
</tr>
<tr>
<td>WHOQOL-EN</td>
<td>3.6(0.4)</td>
<td>3.8(0.6)</td>
</tr>
</tbody>
</table>

*Peer Leaders, and participants who did not complete follow up measures were not included; PHQ-9: Primary Health Questionnaire; GAD-7: Generalised Anxiety Disorder Questionnaire; HS: Help-Seeking (Emotional Competence Questionnaire); WHOQOL: World Health Organisation Quality Of Life Questionnaire (Abbreviated version WHOQOL-BREF)
Figure 5.1: Pilot Study Baseline and Follow-up Depression Scores for the Control and Intervention Groups
Figure 5.2: Pilot Study Baseline and Follow-up Anxiety Scores for the Control and Intervention Groups
Figure 5.3: Pilot Study Baseline and Follow-up Help-Seeking Scores for the Control and Intervention Groups

Figure 5.4: Pilot Study Baseline and Follow-up Physical WHOQOL-BREF Scores for the Control and Intervention Groups
Figure 5.5: Pilot Study Baseline and Follow-up WHOQOL-BREF Psychological Scores for the Control and Intervention Groups
Figure 5.6: Pilot Study Baseline and Follow-up Social Relationships WHOQOL-BREF Scores for the Control and Intervention Groups
The post-intervention PHQ-9 depression and GAD-7 anxiety scores trended upwards for all groups, prior to exams. There were minimal changes in help-seeking scores or in quality of life scores in any of the four domains in the WHOQOL-BREF (Physical, Psychological, Social-Relational and Environmental) for baseline and follow-up scores for control and all intervention groups.

5.4.5 Qualitative Results from Focus Group and Questionnaire Data

Two focus groups were held at the conclusion of the study. The first focus group was for the peer leaders, and all six peer leaders attended. The second focus group was for peer-led participants, and two students attended, probably due to the timing around exams. For the open question on the final questionnaire, one out of six peer leaders responded and 28 out of
61 peer-led participants responded. Thematic analysis of the comments from the focus groups and the questionnaires is reported below. Quotes are selected from twelve of the participants.

The main themes regarding the experience of being a peer leader are listed below in order of frequency, with the most commonly-reported theme being first:

5.4.5.1 Thematic analysis of the experience of being a peer leader

- Gaining a sense of responsibility and confidence:

  “...I am confident that I can help others and support them...”

  “...I enjoyed being a peer leader and having the chance to do something practical...”

- Learning skills which could have a wider impact:

  “...I feel much more confident in being with people in a time of stress/grief for them – I think it will help me with patients....”

  “......I really had a wonderful time and it was a great experience... I learned things that can’t be taught in class and it enhanced my communication skills....”

- Practical aspects of mindfulness component of study protocol including the need to standardise the mindfulness intervention and run sessions more often:

  “....I felt a little underprepared for leading the peer session, even though I had the CD – I would have required more training...”
“...... suggestions....regular meetings (1-2 x a week) that people can show up if they want to be led in an exercise that day....”

5.4.5.2 Thematic analysis of the experience of being a participant in peer-led programme

The main themes regarding the experience of being a peer-led participant are listed below in order of frequency, with the most commonly-reported theme being first

- More frequent organised group-led sessions suggested:

  “......Organised group relaxation would be more helpful than individual exercises if poss. Difficult to motivate myself/remember in my own time.....”

  “....To have a really effective intervention, must have group activities to relax otherwise people will forget....”

- Positive comments about the concept of peer support and the study:

  “....Simple, straightforward questions are good. I think it is a brilliant idea - keep it up...”

  “....Knowing that the contact details of counselling services were sitting in my inbox (from my group support leader) was helpful. I did not use these services but I considered doing so, and may have done so eventually if the study was longer.....”

- Suggestions about the methodology of the pilot or subsequent peer intervention trial:

  “......We are all stressed at this stage. Do you think the timing will create a bias....? 

  “......Maybe need a way to measure adherence in the treatment group....”

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Only three peer-led participants made negative comments about the study. Two of them had concerns about the confidentiality of the data, and one person commented that the study was “depressing”.

5.4.6 Additional Feasibility Data Results

From the 61 participants who completed the follow-up questionnaire, 55 answered the question about preferences regarding the seniority of student leaders providing peer support. The results are shown in Figure 5.8 below, and indicate that there was no clear preference regarding same-year or year-above peer leaders.
5.5 Pilot Study Discussion

5.5.1 Main Findings

In order to summarise the key findings of this pilot study, the research questions will be revisited, as shown in Table 5.7.
Table 5.7: Research Questions and Main Findings of Pilot Study

<table>
<thead>
<tr>
<th>Pilot Study Research Question</th>
<th>Main Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>What is the feasibility and acceptability of three different peer-led interventions designed to improve mental health and quality of life in medical students?</td>
<td>Three different peer-led interventions designed to improve mental health and quality of life in medical students were found to be feasible and acceptable</td>
</tr>
<tr>
<td>What is the experience of being a peer leader and of being a peer-led participant?</td>
<td>The experience of being a peer leader and of being a peer-led participant was extremely positive. Specific recommended changes were made.</td>
</tr>
</tbody>
</table>

The three different peer-led interventions were all found to be feasible and acceptable to the group of medical students, both to the peer-led participants and to the peer leaders. The preparatory phase of the intervention, the peer leader training programme, similarly was found to be feasible and acceptable to both peer leaders and facilitators. The research processes, recruitment, data collection and randomisation, which were trialled in the pilot study, were also found to be feasible and acceptable. The peer leaders and the peer-led participants found the experience of being part of a peer-led programme to be extremely positive. The qualitative data highlighted the importance of standardising the mindfulness component of the intervention, and a desire for more regular mindfulness sessions.
As well as answering the research questions, the pilot study provided several other useful findings. The prevalence data from the baseline measures provided a useful comparison with the prevalence data collected in the candidate’s previous study with the CALM website. This point will be addressed after the subsequent RCT, when the prevalence data from all three of the candidate’s studies will be discussed together.

In terms of the design of future peer-led interventions, having a panel of elected peer leaders was raised as a possible option by the study participants. The peer leaders also reported that students seemed more willing to approach them directly after they had been seen in a visible leadership role. The feasibility of running a peer leader programme as an extra-curricular activity was also tested, and although it was found to be possible, it did place constraints on the hours available to run training sessions. Lastly, in response to a question regarding the seniority of peer leaders in possible future peer-led programmes, the pilot study participants did not have any preference between same-age peer leaders, or peer-leaders in the year above them at medical school.

5.5.2 Strengths and Limitations of the Pilot Study

One of the strengths of this pilot study was that it tested the feasibility and acceptability of the research processes and also both the preparatory and delivery phases of the intervention. This information could then be used to fine-tune the intervention and methodology in the subsequent RCT. Ideas from the student participants were incorporated into research and intervention processes during the pilot study; for example using the student representative’s ideas for recruitment strategies and the peer leaders’ ideas as stated above. This inclusive process demonstrates ‘meaningful participation’ of young people as recommended by the
Youth Development Strategy Aotearoa (59), as well as being in keeping with the theory of empowerment (39).

The study design had several strengths, one of which was using a control group. Another strength was that it was a four-arm trial where three slightly different interventions were tested. This approach provided more information about the specific details of future peer-led interventions. The mixed methods approach was also a strength of the design, as the qualitative data provided useful information about the participant experience and recommendations for improvement. The participation rate in this pilot study was high and there was a low attrition rate, although participation in the participant focus group was low. Studies with medical students often find that there is a high drop off rate just before exams (231), and so the high retention rate was a strength of the candidate’s pilot study. There are several possible reasons for this high level of interest. There was a very positive feeling about the study from the students at the recruitment meeting with discussion about the potential significance of any results. This was almost certainly generated by using the student representative’s strategies for the recruitment presentation, and this level of interest could have continued for the short duration of the pilot study. The low attrition rate could also have been due to the use of participant vouchers, for although these were given out at the start of the study, they could have been viewed as ‘a contract’ by the students, who felt committed to completing the final questionnaire. Lastly, the low attrition rate could have been due to the scheduling of the final data collection meeting, which was scheduled directly after a popular lecture, where information about exams was discussed, or because there was catering provided. A strength of the research protocol was scheduling the randomisation procedure to follow on immediately after baseline measures had been collected. Running these processes
back to back ensured that the enrolled participants were randomised straight away, and there was virtually no attrition.

One of the weaknesses of this pilot study was the conflict of interest created by the multiple roles of the candidate, who was active in a research role, but who also provided the training for peer leaders, and was available to provide support or guidance to them if required during the intervention delivery. This means that the research was not carried out by an independent person. Furthermore, the culture of caring introduced by the candidate may have had an impact on the trial participants, including those in the control arm. Similarly, it is possible that there was leakage between groups caused by participants having informal discussions with people in a different arm of the study. This is likely, as the participants in the four arms of the trial were all members of the same two medical school classes, and therefore may have been in contact at medical school or socially

Another weakness of the study was that the peer leader focus group held at the end of the study had a dual purpose, as it served as a debriefing session in addition to being the scheduled time to collect qualitative data. This was due to the limited availability of the peer leaders, who did not wish to meet prior to exams and who requested that the focus group was run on the day following the final exam, which was immediately prior to the start of the semester break. Therefore, it was not possible to schedule two separate meetings for these different purposes. However this reflects the reality of taking the curriculum into account when conducting research within an educational environment (390).
A further weakness was the poor attendance at the peer-led-participant focus group, which could have been due to the proximity to exams. Convenience sampling was chosen for the peer-led participant focus group because many students had already left for the holidays. Therefore convenience sampling enabled selection of the most available participants and was the most practical option. Although such non-random volunteer sampling may have been the most realistic approach, it also had its limitations. The sub-sample who attended may not have been representative of the entire sample. This introduces bias, affects the quality of the data and limits the conclusions which can be drawn.

The secondary outcome measures that were used could be viewed as a limitation of this study. Although the primary outcome measures, the PHQ-9 and the GAD-7, seemed to indicate some possible change over time, the WHOQOL-BREF and the help-seeking questionnaire scores suggested minimal changes between the two time points when looking at the graph trends. This could signify that there was minimal difference in help-seeking behaviour or in quality of life over this time period or the fact that the pilot study was not powered to detect change. It is possible that the intervention was not delivered in an optimal way, as it is not currently clear how often mindfulness practice needs to occur to have an effect (303). It is also possible that the fact that each of the intervention groups chose to follow a different peer leader selection process, could have introduced an element of bias, which in turn influenced the effectiveness of the interventions. However, the lack of change could also indicate that the secondary outcome measures that were chosen were not responsive to change over this length of time, in this particular population. Lastly, adherence to the intervention was not assessed in this study, which was a weakness, as data regarding numbers of participants attending mindfulness sessions or using peer support, could have
been useful to inform future trial development. Part of an adherence assessment could have included collecting data about the quality and content of the peer-led mindfulness sessions, as it is likely that these were varied.

5.5.3 Comparison with the Literature

With regard to the pilot study reliability testing of the questionnaires, it is interesting to note that the internal consistency of the PHQ-9 when measured in this sample of New Zealand medical students, produced almost identical findings to the PHQ-9 reliability results from the Nigerian medical student study, with Cronbach alpha scores of 0.86 and 0.85 respectively (280).

The feedback from the peer leaders in this pilot study was extremely positive. Other studies have also found that peer leaders have found the experience extremely positive as well (376, 392). There are even robust trials that clearly demonstrate a variety of additional benefits for the leaders themselves; for example decreases in ‘body dissatisfaction’ and ‘bulimic pathology’ with leaders in peer-led eating disorders programme (369), and even remaining abstinent from smoking in another study (403). One previous study was conducted with peer leaders aged 14-16 years old, where the group of peer leaders themselves had social, emotional and behaviour problems (404). Two of the main themes expressed by the peer leaders in that study in terms of the benefits of being a leader, were ‘responsibility’ and ‘identification of learning new skills and strategies’. This research supports the candidate’s pilot study findings as these were also the two main themes expressed by the peer leaders in the qualitative findings. It is interesting that the peer leaders in the aforementioned secondary school study also identified having ‘a sense of belonging’ as one of the main benefits of
becoming a leader, which was not a theme identified by the leaders in the candidates’ medical student group in the current study. One could hypothesise that in the study with the younger peer leaders, it is perhaps because the leaders themselves had social, emotional and behavioural problems that the sense of belonging was so important, and that a medical student group may already be a more cohesive unit. However, a recent UK report, conducted over three years with students from 22 higher education institutions, concluded that having ‘a sense of belonging’ was the most important factor for tertiary students in terms of retention and success at university:(242)

“At the heart of successful retention and success is a strong sense of belonging in Higher Education for all students. This is most effectively nurtured through mainstream activities that all students participate in…. The academic sphere is the most important site for nurturing participation of the type which engenders a sense of belonging.” (242)

5.5.4 Conclusions and Implications for Future Research, Practice and Policy

The results contribute to the existing literature by demonstrating the feasibility of three different peer-led interventions that were designed to improve medical students’ mental health. Although there have been peer-led programmes run in medical schools before, these programmes have usually focussed on academic outcomes and have often been evaluated using self-evaluation or qualitative data only, instead of more objective measures as used in the current pilot study (384, 405). The pilot study also reported data concerning medical student preferences regarding the seniority of peer leaders. The candidate has not found any other literature which addresses this issue. Nor has any literature been found which reports a
peer-led intervention that involves teaching mindfulness. Therefore the candidate’s research adds to the literature in these two areas.

The pilot study also showed that election of peer leaders by the other students is feasible and that students may prefer to appoint a panel of peer leaders to enable student choice when seeking support, rather than being assigned a designated peer leader. Lastly it indicated that enhancing peer leader visibility may be an important aspect of a peer-led intervention. These are hypotheses only, but warrant further discussion, and will be re-visited later in the thesis.

In terms of future research, the pilot study informed the design of the candidate’s randomised controlled trial. The research protocol used in the pilot study was found to be feasible, and so the processes used in the pilot study for recruitment, randomisation and data collection were then used in the RCT. The primary outcome measures, the PHQ-9 and the GAD-7, appeared to be sensitive to change over the duration of the pilot study, and so were also used in the RCT. However, the WHOQOL and HSQ were not used in the RCT. Informed by the pilot study qualitative comments, peer leaders were selected for the RCT by a process of voting, and a panel of leaders was appointed. The pilot study also informed the RCT intervention, as the candidate elected to use the combined approach of peer-led mindfulness and peer support.

5.6 Randomised Controlled Trial of a Peer-Led Intervention

Introduction

The pilot study demonstrated the feasibility of peer-led interventions amongst medical students. Qualitative data from the pilot study also provided insights into ways that the intervention could be improved. After completion of the pilot study, the results were
presented at an international conference on doctors’ health, and further expert opinion was sought from leaders in the fields of peer support. All of this information was used to refine the intervention that was used in the randomised controlled trial (RCT). The pilot study results and expert feedback informed the decision to use a combined intervention of peer-support and peer-taught mindfulness in the RCT. The next section will describe the aims, methodology (including this intervention development), results and discussion of a randomised controlled trial to improve the mental health and wellbeing of medical students.

5.7 RCT Aims

The aim of this randomised controlled trial was to assess the effectiveness of a peer-led intervention in reducing anxiety and depression scores and in improving quality of life and resilience among medical students over a six month period compared with currently available resources. The intervention used a combination of peer support, social connection and peer-taught mindfulness practice. In particular, this trial was designed to answer the following research questions:

- What is the effectiveness of a peer-support and peer-taught mindfulness programme on depression, anxiety, quality of life and resilience scores in medical students over a six month period?
- What is the effectiveness of a peer-support and peer-taught mindfulness programme on perceived competence and motivation to learn in medical students over a six month period?
5.8 RCT Methods

5.8.1 Study Design

A two-arm parallel design randomised controlled trial (RCT) design was used. An individual RCT design and analysis was chosen rather than a cluster RCT design, because as the peer support and mindfulness practice are individual interventions, it was thought that contamination would be minimal (406). For practical reasons, a cluster randomised trial would also have had to involve multiple medical schools and involved a much larger sample size, which was not possible within the scale of this project. Also, the pilot study showed promising trends in outcomes of intervention groups.

5.8.2 Study Population

The study population included medical students in Years 2 and 3 at the University of Auckland in 2011. All students within this population were eligible and were invited to participate. There were no exclusion criteria. Peer leaders were recruited and undertook a six week training programme.

5.8.3 Participant Recruitment and Randomisation

The candidate gave a presentation to the students in Year 3 in the morning on the first day of Semester 1 in 2011. The content of the presentation covered the study outline, the importance of the research in terms of the potential difference it could make to other students, and a clear outline of the time requirement and any potential benefits of participation. The recruitment was to be carried out in two phases: recruitment of ten peer leaders, and then two months later, recruitment of peer-led participants.
5.8.3.1 Recruitment of Peer Leaders

A meeting to elect ten peer leaders was held at the start of the first semester. All students in Year 3 were eligible to attend. On entry, each student was handed a pack containing a participant information sheet and consent form, a voting slip, a peer leader application and a voucher request form. The students were asked to read the information sheet, sign the consent form and then complete the voting slip.

5.8.3.1.1 Peer Leader Voting

The peer leaders were selected by the process of submitting an application form, and also by election by their peers. The idea of voting for the peer leaders came from the procedure used by the Peer Sexuality Support (PSS) Programme, a peer-led initiative with a focus on sexual health, which is currently in place in some Auckland secondary schools (407). Elliot states that The PSS Programme uses a student nomination procedure to ensure that the peer leaders are respected by their peers and are regarded as being approachable.

For the voting procedure in this RCT, the students were given a voting form, which stated:

“Please vote for 3 people in Year 3 who you think would make good Peer Leaders. We are looking for ‘the trusted people’ i.e. the people that you (or other students in Years 2 and 3) might choose to talk to if you were in difficulty, or had an emotional or practical problem.”

(Appendix 16)

The students were also asked to vote for themselves if they wanted to be considered for a peer leader role. The voting form stated that the student who was written down as first choice
would be awarded three points, second choice would be awarded two points and third choice would be awarded one point.

Alongside the voting form, there was an application form, and the students were asked to complete this form if they wished to be considered for a peer leader position. If a student received votes from their peers but they had not filled in a peer leader application form, then they would not be considered for a peer leader position. They would thus be able to abstain without having to declare their lack of interest to the whole year group. For students who did wish to be considered for a peer leader position, there was also no requirement to publicly declare their interest. Furthermore, the number of votes received by each applicant would remain unknown. This written selection procedure preserved some measure of anonymity, and was used so as not to bias the application process towards the more extrovert students. A further reason for the use of application forms was that this is part of the peer leader selection process used at the University of Oxford (personal communication with Anne Ford), although at Oxford the written application is a preliminary step that is followed up by an interview, should the applicant be successful. However the candidate reasoned that a selection process that involved peer leader voting and written applications would be sufficient for the purposes of this trial. The application forms used in this RCT contained the instruction: “Please write no more than a paragraph or two and include why you would like to be a peer leader, and why you think you would make a good peer leader”. (Appendix 17)

5.8.3.1.2 Peer Leader Selection

All peer leaders were selected from Year 3 with the following procedure:
1. Participants who had not submitted a peer leader application form were excluded, even if they had received votes from other students.

2. The number of people who had voted for an applicant was counted, regardless of whether they had put that applicant’s name in 1st, 2nd or 3rd place. Applicants who received votes from three or less people were excluded, to minimise the likelihood of electing a leader who had only received votes from their immediate circle of friends or from those sitting around them during the election.

3. Points were added up for all candidates from the student voting slips. The scoring system was three points for a name written in first place, two points for a name in second place and one point for a name in third place. A total election score was recorded for each candidate.

4. Peer leader applications were scored with a marking grid to assess levels of skills, attitude and probable commitment to the peer leader programme. The marking grid was developed by the candidate and was informed by the literature (400, 408, 409) and by the candidate’s experience in teaching medical students. Marks out of ten were awarded for each of six categories: previous peer leader experience, previous teaching experience, attitude, ability to be reflective, insight and other skills. A total skills score out of 60 was recorded for each candidate.

5. The final selection was made by taking into account the election score and the skills score, as well as balancing the group of leaders in terms of gender, ethnicity and skill mix. The decision to balance the peer leader group in terms of demographics was based on the recommendations of The PSS Programme, which proposes that the group of student leaders ideally should contain students who reflect the wider student population in terms of gender, cultures and social groups (407).
Although the candidate had originally intended to select ten of the applicants as peer leaders, the calibre of the applicants was so high that twelve peer leaders were selected. Increasing the number of leaders undergoing training would also ensure that there was a sufficient number of peer leaders should there be any attrition during the trial. The medical school was notified with the names of the selected leaders.

5.8.3.2 Recruitment and Randomisation of Peer-led Participants

Two months later, two participant recruitment meetings were held, one for Year 2 students and one for Year 3 students. At each of these meetings, which were held two days apart, the recruitment procedure was followed by immediate randomisation of the participants. This procedure was the same one as was used in the pilot study. The participants were each given a consent form, a questionnaire, a voucher request form and a randomisation envelope. The consent form and questionnaire contained the same participant identifying number (PIN). Participants filled in the consent form and handed it in to the researcher. Then they completed the baseline questionnaire and handed it in, after which they then opened their randomisation envelopes, which informed them of their allocation to ‘Group A’ (the control group) or to ‘Group B’ (the intervention group).

Prior computer-generated individual randomisation had been undertaken, stratified by year of medical training, by a researcher not involved in the recruitment or assessment procedures. Opaque, sealed envelopes and Group A or B terms were used to ensure allocation concealment prior to enrolment and baseline assessment.

Once the participants had received their allocation, the control group participants were given some refreshments to take away with them. The intervention group were asked to take their
‘B’ slip to one of the peer leaders and to exchange it for their intervention CDs’. The intervention group remained in the room and had some refreshments. When the entire control group had left the room, the peer leaders gave a short presentation to the intervention group.

The peer leaders had been asked by the candidate to make sure that they clearly outlined the four components of the intervention in their presentation. They therefore outlined the protocol for the intervention group: mindfulness CDs’ for individual practice at home, attendance at a weekly peer-led mindfulness session, attendance at peer-led social events, and opportunities for one-on-one consultation with the peer leaders if required. They said that attendance at the peer-led sessions was optional, but asked that the students could attend if possible. They also gave details of how and when students could contact them if required.

5.8.4 Outcome Measures

Measures were taken at baseline and at six-month follow-up. The primary outcome measures for depression and anxiety were the same as those used in the CALM study and in the pilot study, the PHQ-9 and the GAD-7. The secondary outcomes that were measured included: quality of life, resilience, academic self-concept and academic motivation.

Dyrbye’s systematic review of mental ill-health in medical students reported that only a few studies had investigated the relationship between mood and academic performance (21). The candidate decided to include academic measures alongside mental health measures in this study because several studies at the medical school in which the candidate’s research was undertaken have shown links between quality of life, motivation to learn and estimates of academic achievement (398, 410). More recently an article was published that showed issues of anxiety link with academic practice in a more extensive medical student cohort (411).
Therefore, it was possible that the aspect of wellbeing and the implementation of peer support systems could not only have an impact on factors of wellness, but could also influence study-related behaviour and ultimately academic performance. It was also thought that this information may be of value when considering the integration of any future peer-led programme into the curriculum.

Academic self-concept refers to the feelings or beliefs that students have about their own academic ability formed through individual experiences or interactions with the environment (412). Self-concept is known to have a causal relationship with academic achievement (412). Academic self-concept was measured using the Perceived Competence Scale (PCS(413)) (414). This scale consists of four questions, each scored between one and seven from which a mean score is calculated.

The Motivated Strategies for Learning Questionnaire (MSLQ) is a tool which measures academic outputs (415). This questionnaire measures student motivation to learn and self-regulated learning. It is a self-report tool with five different components, which measure self-efficacy, intrinsic value, test anxiety, self-regulation and use of learning strategies. The tool has been validated against classroom academic performance in a correlational study and has been shown to be a predictor of academic performance (415). The MSLQ has 44 questions each of which are scored between 1 and 7. The questions are grouped into five domains and for each domain, a mean score is recorded.

The other secondary outcome measures used in the RCT included quality of life, measured using the Linear Analogue Self-Assessment (LASA), and resilience data which was collected using the RS15. A 25-item resilience questionnaire was developed and validated by Wagnild
and Young in 1993 (416). These authors identified five resilience themes from reviewing the literature, and then validated the tool against themes identified from interviews with resilient people. Validity was supported by correlations against the scores on the questionnaire, and measures of morale, life satisfaction and depression. Factor analysis resulted in the development of a 15-item resilience questionnaire, the RS15, which was shown to have internal consistency with a Cronbach alpha score of 0.91 (417). The quality of life tool used in the RCT, the LASA, was a different instrument to the one which was used in the pilot study, where quality of life was measured with the WHOQOL-BREF. There were two reasons for this change in instrument. Firstly, the LASA is a 12-item questionnaire, whereas the WHOQOL-BREF has 26 items. In the RCT, participants were asked to complete six questionnaires, and there was a limited time available for this data collection, hence the change to a tool with less items. Secondly, in the pilot study there was minimal change over time in the quality of life scores as assessed by the WHOQOL-BREF. Although the pilot study was of a shorter duration than the RCT, it is possible that that the WHOQOL-BREF may not be the most responsive tool for measuring changes in quality of life in this population. Furthermore, the LASA has been validated and used to assess quality of life in participants using a mindfulness-based intervention (418).

The final questionnaire also included open-ended questions to collect qualitative data about the experience of participating in the intervention, and to assess adherence to the intervention.
5.8.5 The Intervention

5.8.5.1 Intervention Development

After the conclusion of the pilot study, the candidate visited Oxford University to meet with Anne Ford, who established The Oxford University Peer Support Programme. The training manual for the Oxford Peer Support Programme was used for the peer leader training in the pilot study, and this programme has been partially described above. The peer support programme at Oxford University is well established and several groups of peer leaders undergo training at any one time. At the time of the discussion, 27 colleges at Oxford University along with the Business School and the Medical School were involved with the Peer Support Programme. Each college has a panel of 6 to 12 peer leaders. Therefore, there are approximately 350 trained peer leaders actively involved in providing support to students throughout Oxford University at any one time.

The purpose of the candidate’s meeting was to utilise the expertise from the Oxford counsellors, by discussing the results of the pilot study and the development of the peer-led intervention for the subsequent trial. Several components of the intervention in the main trial were included as a direct result of the discussion with Anne Ford and her colleagues, and these will be summarised below. The selection of peer leaders at Oxford University involves prospective candidates filling in an application form, which is then reviewed by the peer support facilitators. Some candidates are then invited to attend at interview. The benefits of written application forms were discussed and the candidate decided to incorporate this approach in the forthcoming trial.
In terms of peer leader training and follow up, the Oxford facilitators stressed the importance of regular supervision for the peer leaders after training has been completed. At Oxford University, if a peer leader misses two supervision sessions, they have to stop being on the peer leader panel. At Oxford University, peer leader training sessions are always held in the counselling centre. The facilitators feel that this choice of venue plays an important part in the training as it increases the peer leaders’ familiarity with the counselling centre and staff, which can serve to reduce the stigma that can be associated with a counselling service. Therefore the candidate planned to use this approach in the main trial and to deliver the training in conjunction with the student counselling service at The University of Auckland, by asking them to provide a facilitator and a venue.

In terms of providing the training, the Oxford facilitators felt that the timing of the training programme was important. In the pilot study, it had been necessary for the candidate to deliver the training in a tight time-frame and four training sessions had been provided over a two and a half week period. The Oxford facilitators stressed the importance of a one week gap between each training session. This was to allow time for the completion of home exercises by the peer leaders, but more importantly, it allowed the peer leaders time for reflection. Advertising and marketing of the peer leader programme was discussed. The Oxford facilitators referred to one of the barriers to help-seeking, i.e. the idea that the problem that a student faced was ‘not serious enough’, or that the student was ‘not sick enough yet’, and must be at the point of crisis before it is appropriate to seek help. This problem is addressed at Oxford in the peer support programme advertising, which highlights the availability of the peer leaders to ‘chat’ about any issue however minor, and suggests to
students that they come and socialise with the peer leaders even if they have no problems to
discuss.

This led on to a discussion about the importance of the visibility, profile and availability of
the peer leaders. In the candidate’s pilot study, it appeared as if the students were more likely
to approach a peer leader immediately after attending a peer-led relaxation session, rather
than by contacting a peer leader specifically for support. The Oxford facilitators were very
much in agreement. Although they had no evidence to support it, the facilitators anecdotally
reported that peer leaders at Oxford were more likely to be approached after they had been
running peer leader teas or social events, rather than to be sought out specifically to provide
support. The counsellors felt that perhaps there was less stigma attached to contacting a peer
leader in this context. Furthermore they stated that students could observe peer leaders in the
process of running events, and decide which peer leader they would feel most comfortable to
approach to talk about a current or future problem. Therefore the Oxford peer support
programme advocated using mechanisms that could raise the profile of the peer leaders, such
as running events with a wellbeing theme, or purely with a social purpose. For instance, peer
leaders in the medical school had recently held an event that had consisted of a panel of
senior doctors discussing work-life balance. On a practical level, the Oxford leaders were
able to sponsor events by using the welfare budget that was allocated to each college, and
held regular peer support tea parties. As many of the students at Oxford University were
residential, the peer leaders were also encouraged to go and knock on students’ doors in the
halls of residence, and invite the students to attend the social events.

Social isolation and low levels of support have been associated with higher levels of stress
and depression (238) (419), and high levels of support leads to an increased likelihood of
remission from depression (420). The literature strongly suggests that “interventions designed to enrich social networks and emotional support will enhance resilience and decrease the likelihood of developing stress-induced depression”(69).

The outcome of this discussion with the Oxford facilitators and in reference to this literature, was that the candidate decided to integrate an element of peer socialising into the intervention for the RCT. Specifically, the peer leaders in the RCT would be asked to run a few ‘peer socials’ that would increase their profile within the intervention group, and create opportunities for establishing rapport between the peer leaders and the other participants.

5.8.5.2 Preparatory Phase: Peer Leader Training

The intervention involved both peer-support and a peer-led mindfulness programme delivered by the peer-leaders to the student participants randomised to intervention. The preparatory part of the intervention consisted of the peer leader training programme. Part of the way through this training programme, the peer leaders started to deliver the intervention

5.8.5.2.1 Facilitation of Sessions

The peer-leader training sessions were co-facilitated by the candidate and a counsellor from the University Counselling Service. The mindfulness training session was run by Dr Craig Hassed, a visiting expert in mindfulness and stress-management training from The School of Medicine at Monash University.

5.8.5.2.2 Schedule of Training Sessions
As part of the curriculum, the training sessions were held at a regular 3-hour slot on a Thursday morning during the first part of the first semester. The peer leader training programme was one of the small group ‘options’ that were part of the Medical Humanities curriculum. The training venue used was a seminar room in the student counselling service premises. Twenty-four hours of training were completed with twelve peer leaders. Two of the peer leaders each missed one training session, but otherwise there were full attendance for the programme.

5.8.5.2.3 Outline of Programme Content

The content for the majority of face to face training sessions was adapted from The Oxford Peer Support Training Manual, which was used in the pilot study (400). As there were more training hours available for the main trial than for the pilot, the training programme for the RCT peer leaders was more closely aligned with the 30-hour Oxford training programme than during the pilot. A brief synopsis of the content of the sessions is provided below.

5.8.5.3 Intervention Delivery

The intervention consisted of several components: the provision of face-to-face peer support, leading two peer social occasions, running weekly peer-taught mindfulness sessions, and encouraging the intervention group to do individual mindfulness practice at home. Participants in the intervention group were asked to attend an introductory meeting run by the peer leaders, to inform them about the intervention components. A timetable of the intervention delivery is shown in Table 5.8, after which the intervention is described in more detail.
Table 5.8: Semester Timetable Incorporating the Intervention Processes

<table>
<thead>
<tr>
<th>Weeks from start of year</th>
<th>Student Academic Timetable</th>
<th>Intervention Processes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Week 0</td>
<td>Peer-led intervention incorporated into the curriculum</td>
<td>Training of Peer Leaders</td>
</tr>
<tr>
<td>Weeks 1-6</td>
<td>Start of Semester 1</td>
<td>Peer leader training commenced 6 x weekly sessions</td>
</tr>
<tr>
<td>Weeks 7-8</td>
<td>Mid-semester break</td>
<td></td>
</tr>
<tr>
<td>Week 9</td>
<td>Peer leader training continued 2 x weekly sessions</td>
<td>Supervision of peer leaders commenced</td>
</tr>
<tr>
<td>Weeks 10-14</td>
<td>Study break, exams and end of Semester 1</td>
<td>Peer leader training finished</td>
</tr>
<tr>
<td>Weeks 16-17</td>
<td>Inter-semester break</td>
<td>Peer support provided</td>
</tr>
<tr>
<td>Weeks 21-26</td>
<td>Start of Semester 2</td>
<td>Peer support provided</td>
</tr>
<tr>
<td>Weeks 27-28</td>
<td>Mid-semester break</td>
<td>Peer support provided</td>
</tr>
<tr>
<td>Weeks 29 – 33</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Week 34</td>
<td></td>
<td>Supervision of peer leaders finished</td>
</tr>
<tr>
<td>Weeks 35-37</td>
<td>Study break, exams and end of Semester 2</td>
<td></td>
</tr>
</tbody>
</table>

The peer-taught mindfulness sessions were held at the medical school during the day at a time that suited both Year 2 and Year 3 students. The peer leaders drew up a roster to cover the six month trial period and allocated two leaders to teach each session. Each peer-taught
mindfulness session ran for half an hour, and the two leaders then stayed for the following half hour to be available should any student wish to talk to them one-on-one. Each participating student in the intervention group was also given a mindfulness CD, which they could use to assist them with practising at home.

Peer support could be provided by the peer leaders at any time negotiated by the leader and the requesting participant. At the start of the trial, the leaders sent an introductory e-mail to the intervention group with details of their availability and their contact details. If a student wished to talk with a peer leader, they could select the leader they preferred and contact them to arrange a meeting. Otherwise the intervention participants could approach a peer leader after the peer-taught mindfulness session and talk with them at that time. The peer leader training programme provided guidelines around leader availability and the importance of setting boundaries and limits when providing support to peers. All peer support conversations were held at the medical school in a professional environment. Peer leaders were asked to attend regular supervision sessions facilitated by a counsellor as soon as they started to provide support to their peers.

The peer leaders were asked to create two or three peer-led social occasions for the intervention group, and they were given a limited budget to run these functions. They were instructed that the point of these ‘peer leader socials’ was to increase their visibility as leaders and to engage with students in the intervention group. The leaders decided to hold the first peer leader social in a setting that was outside of the medical school, and they booked a bowling alley for an evening. Later in the semester they elected to hold the second event at the medical school, where they ran an interactive ‘cup-cake social’. The leaders prepared for this occasion by baking an assortment of different types of plain cup-cakes. They also
brought along different types of bags of icing and decorations and invited participants to create their own cup-cakes. This event was held during the day at the medical school in a ninety minute slot between lectures.

Promotion of the peer leader service provided was limited, in order to reduce interest shown by members of the control group. The leaders sent regular e-mails to the intervention group, reminding them about the regular mindfulness sessions, the upcoming peer leader socials and of their availability for the provision of support. They also made some peer support posters, but they only put these posters up inside the room where they ran the mindfulness training, and on the door outside as a reminder to students whilst the weekly sessions were being held. The organisational arrangements required running the mindfulness sessions and the social occasions were the responsibility of the peer group leaders. This included arranging dates, times, booking rooms and contacting participants.

5.8.6 Assessment of Adherence to Intervention

Adherence to each of the intervention components was assessed. The peer leaders were asked to keep a record of the number of students who attended the mindfulness sessions, as well as the number of students who approached them for face-to-face support. They were asked to bring this record with them to a ‘closing meeting’ to be held at the end of the study. The number of participants attending peer-led social occasions and peer-taught mindfulness sessions and the amount of individual mindfulness practice undertaken, was assessed by adding six adherence questions to the follow up questionnaire filled in by participants at the end of the study. These questions are shown below:
Since the start of this study (27th April 2011):

- Did you attend the peer leader bowling social session?  YES / NO
- Did you attend the peer leader cup cake social session? YES / NO
- During the trial period did you listen to one of the trial mindfulness CD set at least once? YES / NO
- How many of the weekly mindfulness sessions run by the peer leaders did you attend?
- How many times did you practice mindfulness in the 6 months before the onset of the study? (i.e. November 2010 to 27th April 2011)
- How many times did you practice mindfulness in the 6 months since the onset of the study? (i.e. 27th April 2011 to 14th October 2011)

At the final measures meeting, both the control group and the intervention group were asked to complete these adherence questions, in order to help assess level of contamination.

5.8.6.1 Safety Considerations

The processes to ensure safety of all of the participants were the same as those used in the pilot study, in that the peer leaders had been given training about referral, information about support services, and a phone number of a counsellor who was also available after hours. The control group students had access to the CALM website, pastoral care from academic staff and the University counselling service. In addition to this, the peer leaders received regular group supervision from a counsellor at The University Health Service. These supervision sessions started mid-way through the peer leader training programme and continued to the end of the trial. If a leader had not provided any support to a student, they were not required to attend supervision. In the interests of safety, the peer leaders were asked to support any
student who approached them for help, regardless of that particular student’s assigned intervention group, but to keep a record of all students who consulted them.

5.8.7 Peer Intervention Trial Organisation and Management

The candidate performed the day to day running of the pilot and RCT, data collection, data entry and some date analysis, the RCT peer leader selection process, and ran the pilot study focus groups. The candidate also facilitated the training sessions for the peer leaders in the preparatory phase of the trials in conjunction with a counsellor, as well as acting as an overseer and point of reference for the peer leaders throughout the trials. This role involved managing administrative issues such as booking rooms for peer group meetings, as well as providing clarity around the role of a peer leader and advice about when to seek support or refer a student elsewhere.

Research assistants aided with data collection, double data entry and administrative tasks such as the purchase and allocation of participant vouchers, and statisticians provided assistance with data analysis. Supervisors assisted with study design, generation of the computerised randomisation sequence, data collection meetings, analysis and interpretation.

Alongside the candidate’s doctoral fund, additional financial support was received from the medical school Year 3 co-ordinator and internal department funds.

5.8.8 Sample Size and Power Calculations

The changes on the PHQ-9 were defined by reference to the literature. A 2011 psychometric study of the PHQ-9, concluded that it was responsive to change during a treatment study of depression (421). In this study, remission was defined as being above the cut-off of 10 or
more pre-treatment, and below the cut-off of 10 post-treatment. A further term of ‘reliable improvement’ was defined as being a reduction in a PhQ-9 score of at least 5. The pre-treatment PHQ-9 mean in this study was 14.5 and the post treatment mean was 7.02, giving a change in mean scores of 7.48, and the effect size was 1.65. However, the sample in this study currently had clinical depression, and it was likely that there would be a bigger change in scores than there would be in a population who had a higher level of baseline mental health. In the peer-intervention trials, the sample participants were generally well, although some of them may have had sub-syndromal depression or depression, and so a change of scores of 3 by PHQ-9 was estimated. Using the CALM study baseline PHQ-9 score of 5.14 (4.06), this would mean that with a change in scores of 3, an estimated effect size would be 2.14/4.06, in other words 0.5. In a sample who have a higher baseline level of mental health, there would be a smaller likely change in scores making a smaller effect size (e.g. 0.5), in comparison to the effect size of 1.65 in the sample of people who were depressed.

A sample of 192 students was required to detect as statistically significant an estimated difference of 3.0 in PHQ-9 depression score, 2.0 in GAD-7 anxiety score and 0.7 in Resilience Scale score between intervention and control groups at 6 months allowing for a 10% attrition rate (alpha = 0.05, power = 80%) (Table 5.9).
Table 5.9: Estimated sample size required to detect a clinically significant change in depression (PHQ-9), anxiety (GAD-7) and resilience score#

<table>
<thead>
<tr>
<th>Variable</th>
<th>Control 12 month Mean (SD)</th>
<th>Intervention 12 month Mean (SD)</th>
<th>Difference Between Means</th>
<th>N per group</th>
<th>Total N required (N assuming 10% attrition)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHQ-9 score</td>
<td>8.4 (5.8)</td>
<td>5.4 (5.8)</td>
<td>3.0</td>
<td>59</td>
<td>118 (131)</td>
</tr>
<tr>
<td>GAD-7 score</td>
<td>5.9 (4.7)</td>
<td>3.9 (4.7)</td>
<td>2.0</td>
<td>87</td>
<td>174 (192)</td>
</tr>
<tr>
<td>Resilience score</td>
<td>8.6 (0.73)</td>
<td>7.9 (1.28)</td>
<td>0.7</td>
<td>35</td>
<td>70 (78)</td>
</tr>
</tbody>
</table>

# Means, standard deviations and estimated effect sizes were obtained from the CALM website study (Chapter 3) and from the literature (417).

5.8.9 Data Analysis

Primary and secondary outcomes were assessed at baseline and at six months by completion of questionnaires. Baseline and follow-up questionnaire data were entered using an ACCESS database. Data entry errors were checked for by double data entry and electronic comparisons. Means and standard deviations were calculated. Cronbach alpha scores were calculated to check the internal consistency of the questionnaires. A regression analysis was used to measure the difference between dependent and independent variables. The dependent variable was the change in scores (post-pre), and the independent variables were group (intervention or control), baseline scores and gender. The regression analysis assessed the association between variables, and allowed for this when looking at the difference between the intervention and control group scores at follow up, thereby controlling for potential confounders.

5.8.10 Ethical Considerations and Consultation for the Peer Intervention Trials

The pilot study was approved by The University of Auckland Ethics committee in July 2010 (reference number 2010/275, Appendix 6) and the RCT was approved by the same
committee in February 2011 (reference number 2011/028, Appendix 13). However, in March 2011, at the start of the academic year, the candidate was approached by the medical school and invited to include the preparatory part of the intervention (the Peer Leader Training Programme) in the undergraduate curriculum, as part of the Medical Humanities programme where students work in small groups. This raised new ethical considerations regarding the candidate’s dual role as Principal Investigator and as academic tutor and assessor. Therefore, the candidate approached other staff to assist with teaching along with the development, marking and examination of assignments, to address any conflict of interest. A document was developed outlining details of the separation of the students’ academic compulsory requirements with the optional requirements of participating in a peer-leader role as part of the trial. A revised ethics application was submitted and approved by the ethics committee.

Consultation was undertaken with a senior Māori academic, Associate Professor Papaarangi Reid, Tumuaki at the University of Auckland prior to the conduct of the peer intervention trials. Although Māori health was not the main focus of the research, Māori do have a high prevalence of anxiety and depression (105), and the recruitment and retention of Māori in medical training is an important issue. The candidates first study (CALM) suggested no difference in ethnicity with regard to help-seeking behaviour in medical students, although the study was not specifically powered to answer this question. It was also thought that the low numbers of Maori students who could participate would not be sufficient to demonstrate differences between ethnic groups in subsequent studies either. However, the consultation affirmed the importance of collecting and recording ethnicity data using a recommended prioritisation system to ensure those with any Maori affiliation would be recognised.
Furthermore it was agreed that the results of the study would also be shared with staff from the Māori and Pacific Admission Scheme (MAPAS) of the Auckland medical school.

### 5.9 RCT Results

#### 5.9.1 Participation Rates

In total, 275 students participated in the study, which included 148 students from Year 2 and 127 students from Year 3. Out of the 275 participants, 45 submitted peer leader application forms (16%), and 165 submitted completed voting forms to elect the peer leaders (60%). Participant flow is shown in a CONSORT diagram in Figure 5.9, which illustrates the participant numbers for recruitment, randomisation and retention.
Figure 5.9: CONSORT Diagram for Peer Intervention RCT

Enrolment

Assessed for eligibility

Excluded (n=139)
Declined to participate (n=139)

Randomized (n=275)

Allocation

Allocated to Control Group (n=142)
Received allocated intervention (n=142)

Allocated to Intervention Group (n=133)
Received allocated intervention (n=133)

Follow-Up

Lost to follow-up
Did not return final questionnaire (n=21)

Lost to follow-up
Did not return final questionnaire (n=22)

Analysis

Analysed (n=121)

Analysed (n=111)
5.9.2 Baseline Characteristics and Outcome Measures

Demographic data included age, gender and ethnicity. The ethnicity of the participants was NZ European (60.5%), Asian (21%), Maori (0.7%), Pacific (2.9%) and Other (14.9%). Baseline characteristics of the total group of study participants are presented in Table 5.10.

Data were relatively normally distributed for continuous variables, so means and standard deviations were calculated. A further table containing the baseline PHQ-9 and GAD-7 results for all three of the candidate’s studies (the CALM study, the pilot study and the RCT) is then presented in Table 5.11 as the prevalence data from the three studies will be discussed.

Table 5.10: Baseline Characteristics of Control and Intervention Groups in the RCT

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Control Group (n = 142)</th>
<th>Intervention Group (n = 133)</th>
<th>Total Group (Control and Intervention) (n = 275)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>77 (54%)</td>
<td>68 (51%)</td>
<td>145 (53%)</td>
</tr>
<tr>
<td>Male</td>
<td>61 (43%)</td>
<td>60 (45%)</td>
<td>121 (44%)</td>
</tr>
<tr>
<td>Missing</td>
<td>4 (3%)</td>
<td>5 (4%)</td>
<td>9 (3%)</td>
</tr>
<tr>
<td>Age, years *</td>
<td>20.9 (2.6)</td>
<td>20.8 (3.1)</td>
<td>20.9 (2.9)</td>
</tr>
<tr>
<td>PHQ-9</td>
<td>4.8 (3.6)</td>
<td>5.6 (3.8)</td>
<td>5.2 (3.7)</td>
</tr>
<tr>
<td>GAD-7</td>
<td>4.8 (3.4)</td>
<td>4.2 (3.4)</td>
<td>4.5 (3.4)</td>
</tr>
<tr>
<td>Resilience Scale</td>
<td>85.2 (12.1)</td>
<td>83.8 (12.7)</td>
<td>84.6 (12.4)</td>
</tr>
<tr>
<td>LASA</td>
<td>7.4 (1.6)</td>
<td>7.1 (1.5)</td>
<td>7.3 (1.6)</td>
</tr>
<tr>
<td>PCL</td>
<td>5.5 (1.0)</td>
<td>5.5 (1.1)</td>
<td>5.5 (1.1)</td>
</tr>
<tr>
<td>MSLQ: Self efficacy</td>
<td>5.0 (1.0)</td>
<td>5.0 (1.1)</td>
<td>5.0 (1.0)</td>
</tr>
<tr>
<td>Intrinsic value</td>
<td>5.9 (0.6)</td>
<td>5.9 (0.6)</td>
<td>5.9 (0.6)</td>
</tr>
<tr>
<td>Test Anxiety</td>
<td>3.4 (1.4)</td>
<td>3.3 (1.5)</td>
<td>3.4 (1.5)</td>
</tr>
<tr>
<td>Cognitive Strategy Use</td>
<td>5.3 (0.7)</td>
<td>5.3 (0.7)</td>
<td>5.3 (0.7)</td>
</tr>
<tr>
<td>Self-Regulation</td>
<td>5.0 (0.7)</td>
<td>4.9 (0.7)</td>
<td>4.9 (0.7)</td>
</tr>
</tbody>
</table>

PHQ-9: Primary Health Questionnaire; GAD-7: Generalised Anxiety Disorder Questionnaire; PCL: Perceived Competence for Learning; LASA: Linear Analogue Self-Assessment; RS: Resilience Scale; MSLQ: Motivated Strategies for Learning Questionnaire

*1 value missing from intervention and control
Table 5.11: Baseline PHQ-9 and GAD-7 Results from Three Studies: the CALM Study, the Pilot Study and the RCT

<table>
<thead>
<tr>
<th></th>
<th>CALM Study (n=279)</th>
<th>Pilot Study (n = 79)</th>
<th>RCT (n = 275)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHQ-9 mean (sd)</td>
<td>5.1 (4.1)</td>
<td>4.3 (4.3)</td>
<td>5.2 (3.7)</td>
</tr>
<tr>
<td>GAD-7 mean (sd)</td>
<td>3.9 (3.7)</td>
<td>3.7 (3.0)</td>
<td>4.1 (3.4)</td>
</tr>
</tbody>
</table>

**Instrument Reliability**

As in the pilot study, the reliability of the tools used in the RCT was checked by calculating the coefficient alpha index. The results are shown in Table 5.12 below

Table 5.12: Reliability Analysis of RCT Questionnaire

<table>
<thead>
<tr>
<th>Instruments</th>
<th>Cronbach Alpha Scores</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHQ-9</td>
<td>0.80</td>
</tr>
<tr>
<td>GAD-7</td>
<td>0.82</td>
</tr>
<tr>
<td>PCL</td>
<td>0.92</td>
</tr>
<tr>
<td>LASA</td>
<td>0.82</td>
</tr>
<tr>
<td>RS</td>
<td>0.91</td>
</tr>
<tr>
<td>MSLQ Self-efficacy</td>
<td>0.93</td>
</tr>
<tr>
<td>MSLQ Intrinsic value</td>
<td>0.78</td>
</tr>
<tr>
<td>MSLQ Test Anxiety</td>
<td>0.84</td>
</tr>
<tr>
<td>MSLQ Cognitive Strategy Use</td>
<td>0.70</td>
</tr>
<tr>
<td>MSLQ Self-Regulation</td>
<td>0.51</td>
</tr>
</tbody>
</table>

PHQ-9: Primary Health Questionnaire; GAD-7: Generalized Anxiety Disorder; PCL: Perceived Competence for Learning; RS: Resilience Scale; MSLQ: Motivated Strategies for Learning
The component of the MSLQ questionnaire that measures self-regulation is below the suggested cut-off of 0.7 for Cronbach alpha scores. However, it has been stated that when psychological constructs are being measured by questionnaires, values below 0.7 can also be expected because the constructs being measured are so diverse (422) The Cronbach alpha scores for all other components of the MLSQ, and for the other questionnaires, suggest that the questionnaires used have internal consistency and are reliable in this population. Therefore a total score for each questionnaire can be used in data analysis without analysing the individual items of the questionnaire.

5.9.3 Final Results

Follow up scores for all outcome measures were measured 26 weeks after baseline. Follow up measures were collected from 232/275, which is an 84% retention rate. The final results are shown in Table 5.13 below.

Table 5.13: Baseline and Follow Up Results of Participants who completed the RCT

<table>
<thead>
<tr>
<th>Outcome Measures</th>
<th>Control Group Baseline (n=121)</th>
<th>Control Group Follow Up (n=121)</th>
<th>Intervention Group Baseline (n=111)</th>
<th>Intervention Group Follow Up (n=111)</th>
<th>p-values</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHQ-9</td>
<td>4.82 (3.67)</td>
<td>5.02 (3.19)</td>
<td>5.61 (3.85)</td>
<td>5.15 (3.72)</td>
<td>0.52</td>
</tr>
<tr>
<td>GAD-7</td>
<td>4.73 (3.54)</td>
<td>4.67 (3.68)</td>
<td>4.37 (3.45)</td>
<td>4.14 (3.66)</td>
<td>0.35</td>
</tr>
<tr>
<td>LASA</td>
<td>7.39 (1.68)</td>
<td>7.25 (1.46)</td>
<td>7.18 (1.49)</td>
<td>7.24 (1.48)</td>
<td>0.62</td>
</tr>
<tr>
<td>Resilience Scale</td>
<td>84.86 (12.72)</td>
<td>85.46 (13.26)</td>
<td>84.34 (12.89)</td>
<td>85.81 (12.83)</td>
<td>0.55</td>
</tr>
<tr>
<td>PCL</td>
<td>5.48 (0.99)</td>
<td>5.25 (1.06)</td>
<td>5.54 (1.04)</td>
<td>5.47 (1.08)</td>
<td>0.10</td>
</tr>
<tr>
<td>MSLQ a</td>
<td>4.99 (1.02)</td>
<td>4.82 (1.59)</td>
<td>4.95 (1.10)</td>
<td>4.98 (1.50)</td>
<td>0.27</td>
</tr>
<tr>
<td>MSLQ b</td>
<td>5.87 (0.65)</td>
<td>5.79 (1.68)</td>
<td>5.94 (0.66)</td>
<td>5.90 (1.93)</td>
<td>0.76</td>
</tr>
<tr>
<td>MSLQ c</td>
<td>3.38 (1.39)</td>
<td>3.54 (1.49)</td>
<td>3.26 (1.50)</td>
<td>3.42 (1.36)</td>
<td>0.75</td>
</tr>
<tr>
<td>MSLQ d</td>
<td>5.33 (0.67)</td>
<td>5.20 (0.73)</td>
<td>5.27 (0.68)</td>
<td>5.24 (0.62)</td>
<td>0.25</td>
</tr>
<tr>
<td>MSLQ e</td>
<td>5.00 (0.67)</td>
<td>4.82 (0.77)</td>
<td>4.87 (0.71)</td>
<td>4.84 (0.76)</td>
<td>0.19</td>
</tr>
</tbody>
</table>

PHQ-9: Primary Health Questionnaire; GAD-7: Generalised Anxiety Disorder Questionnaire; PCL: Perceived Competence for Learning; LASA: RS: Resilience Scale; MSLQ: Motivated Strategies for Learning
There were no statistically significant differences between the control and intervention groups in any of the outcomes over time.

5.9.4 Adherence to the Intervention

Adherence to each of the components of the intervention was assessed. Nine of the twelve peer leaders attended the ‘closing meeting’ at the end of the study. Of the nine peer leaders who attended the meeting, eight of them had recorded the exact number of students who had contacted them for support during the trial, as shown in Table 5.14. During the discussion at the closing meeting, most of the peer leaders reported that they had mainly been approached by students at the end of a peer-led mindfulness session, where the student seeking help had stayed behind to talk to the leader. The one peer leader who attended the closing meeting but who did not provide the numbers of students seen, commented that she did ‘chat’ to students who hung back to talk to her after she had been running a mindfulness session, but that she was not sure if this qualified as providing support or not, and so had not recorded any numbers. One leader also reported that she had referred two students to the counselling service, and another two leaders reported that they had seen two students more than once.
Table 5.14: Adherence to Face-to-Face Peer Support Component of Intervention

| Number of students who made an initial contact with a peer leader | 36 |
| Number of students who followed through with a face-to-face meeting with a peer leader | 34 |

* Data provided by 8/12 peer leaders

Therefore, out of the 133 peer-led students in the intervention group, 34 (26%) of them were recorded as using the peer leader face-to-face support component of the intervention. However, four of the peer leaders did not collect or submit this information, so this may be an underestimate.

Table 5.15: Adherence to Social and Mindfulness Components of the Intervention from Participants who Completed the RCT

<table>
<thead>
<tr>
<th></th>
<th>Control Group (n=121) No. of participants doing this component (and % of control group)</th>
<th>Intervention Group (n=111) No. of participants doing this component (and % of intervention group)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attended peer-led social event 1 (bowling)</td>
<td>0</td>
<td>10 (9%)</td>
</tr>
<tr>
<td>Attended peer-led social event 2 (cup cake)</td>
<td>2 (2%)</td>
<td>56 (50%)</td>
</tr>
<tr>
<td>Listened to mindfulness CD once or more</td>
<td>0</td>
<td>74 (67%)</td>
</tr>
<tr>
<td>Attended peer-led mindfulness session one or more times</td>
<td>0</td>
<td>46 (41%)</td>
</tr>
<tr>
<td>Increased individual home mindfulness practice (from pre-trial home practice)</td>
<td>16 (13%)</td>
<td>66 (59%)</td>
</tr>
</tbody>
</table>
Self-reported adherence to the social and mindfulness components of the intervention are listed in Table 5.15 for the intervention and control groups. This shows some evidence of contamination of intervention, although rates were not high in the control group. Out of the 10 participants who attended the first peer-led social event (bowling), 9 of them also chose to attend the second peer-led social event (cup cake decorating). In terms of the attendance at the peer-led mindfulness sessions, 17 participants attended once, 19 attended twice, and 10 attended 3 or more times.

5.10 RCT Discussion

5.10.1 Main Findings

In order to summarise the main findings of this thesis, the research questions will be revisited as shown in Table 5.16. The RCT did not find that a peer-led intervention was effective in improving mental health and wellbeing or academic measures in medical students over a six month period compared with current practice.
Table 5.16: Main Findings of RCT

<table>
<thead>
<tr>
<th>Research Question</th>
<th>Main Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>What is the effectiveness of a peer-support and peer-taught mindfulness intervention on depression, anxiety, QOL and resilience scores in medical students over a six month period?</td>
<td>The availability of a peer-support and peer-taught mindfulness intervention was not shown to be effective in improving mental health, QOL, resilience scores or academic measures in medical students over a six month period compared with current practice</td>
</tr>
<tr>
<td>What is the effectiveness of a peer-support and peer-taught mindfulness intervention on perceived competence and motivation to learn in medical students over a six month period?</td>
<td>The availability of a peer-support and peer-taught mindfulness intervention was not shown to be effective in improving perceived competence and motivation to learn in medical students over a six month period compared with current practice</td>
</tr>
</tbody>
</table>

As well as addressing the research questions, the RCT provided several other useful findings. The prevalence data from the baseline measures provided a useful comparison with the prevalence data collected in the candidate’s previous studies, the CALM study and the pilot study. The baseline data collected for all three studies was very similar, even though it was collected from different year-groups of students at different times of the semesters. The mean PHQ-9 mean score ranged from 4.3 to 5.2 and the GAD-7 mean score, from 3.7 to 4.5 across the three studies, so the score only varied by one point or less, which would mean little clinical difference. As discussed in the CALM chapter, these scores are also very similar to a
previous New Zealand study which documented the prevalence of depression and anxiety in a group of medical students (27).

In the RCT, only 21% of the participants were Asian students, compared with 41.1% in the pilot study and 35% in the CALM study. Therefore there appears to be a smaller proportion of Asian students participating in the randomised control trial in comparison to the other two studies. As the proportion of Asian students in the medical school classes from which the samples were drawn were similar, it is likely that there is another reason for this finding. It is known that within the Asian culture, physical symptoms are a more ‘acceptable’ presentation than psychological symptoms (423). However, higher numbers of Asian students did participate in the first two trials, both of which had a mental health focus, and so this is unlikely to be the reason for non-participation in the RCT. However, although the methodology of the peer-intervention pilot study and the RCT were similar, one of the main differences was the duration of the trial. The pilot study ran for 2 months whereas the RCT was a much longer trial at 6 months. A New Zealand study looking at ‘motivation to learn’ in Asian medical students in comparison to non-Asian medical students, found that Asian students had higher levels of self-regulation and test anxiety (410). Therefore one possible explanation is that Asian students chose not to participate in the candidate’s 6 month RCT due to concerns that it may impact on their ability to study.

Furthermore the RCT demonstrated that a peer leader programme is feasible and acceptable as part of a medical school curriculum, and that it was a positive experience for the peer leaders. It also established the feasibility and acceptability of selecting the peer leaders by election, where the votes were cast by the peer-led participants, and of having a panel of peer leaders who could provide support to many students. Peer leader feedback highlighted the
importance of emphasising the visibility of the leader to the peer-led participants. Adherence to the face-to-face peer support component of the intervention was high, with at least a quarter of the student group choosing to meet with a peer leader for support. The RCT also demonstrated that different peer-led participants adhered to different components of the intervention. However, the results also showed that there was some contamination of intervention. This issue will be considered further below.

5.10.2 Strengths and Limitations of the RCT With Reference to the Literature

As the final results of the candidate’s RCT did not show any difference between the control and intervention groups, it is important to thoroughly consider the possible reasons for this. It simply could be an indication that the peer-led intervention was not effective in this sample of medical students, but it could also be an indication of poor internal validity caused by flaws in the study design or protocol. Professors Melnyk and Morrison-Beedy, international experts in trial design from the US, have recently published a book about designing and conducting intervention research (3). This book defines internal validity as “referring to the degree of confidence that the outcome of an experimental study is caused by the independent variable and not by potentially competing factors” (3)(p.92). The book’s authors discuss possible threats to internal validity, many of which have been minimised or negated in the candidate’s trial, as a randomisation process was used. However, several possible threats remain and the candidate will now consider if these threats could have affected the results of the RCT.

One of the possible threats to the internal validity of the trial could have been the unplanned inclusion of the peer leader training programme in the medical curriculum. This may have
influenced the number of peer leader applications or the motivation for applications. The inclusion of the peer leader programme in the curriculum also raised the profile of the trial throughout its duration, which may have increased the interest of the control group and been one of the factors contributing to the contamination. It is also possible that the peer-led social and group mindfulness components of the intervention contributed to the contamination, as they involved an obvious group activity that may have been observed by control group participants. The individual components of the intervention, the provision of one-on-one peer support, and the home mindfulness practice would not have been visible to the control group, and so were less likely to have heightened their interest in the intervention.

Contamination of intervention between the groups could have occurred because the control and intervention group participants were in the same year in medical school and spent many hours a week together, with some participants having close friends who had been randomised to the other group. Therefore it is possible indeed likely, that participants from both groups would interact and discuss the intervention, and that some control group participants may then have chosen to adopt strategies themselves in order to improve their own mental health thus influencing the outcome. This phenomenon has been termed ‘compensatory rivalry’ (424) and can occur simply because the control group members have read the participant information sheet and are aware of the aims of the trial. However with the candidate's trial, this could have been further accentuated by the possible interaction between groups. It has been suggested that both the medical school environment and the personalities of the students contribute to competition between peers and type A behaviour (425) 1984). Medical students have also been shown to have perfectionistic traits (68, 426), and their level of adaptive perfectionism is higher than it is in Arts students (427). It is possible that this combination of
perfectionism and competitiveness could have further heightened the rivalry behaviour. As data were not collected from the control group to assess this possibility when recording adherence to the trial, the conclusion must be that compensatory rivalry was a possible reason for there being no difference between the control and intervention group scores. Although the candidate’s results do not show a significant effect, the trends are in the right direction, and it is a possibility that any effect was diluted by contamination between the groups.

It is also possible for a control group to respond in the reverse manner, and this occurrence has been termed ‘resentful demoralization’ (428). In this situation, control group participants feel that they have been excluded and that they may be ‘missing out’, and consequently their health may then decline. Were this to occur, it could cause a type 1 error, in other words the results would show an effect, where in fact there was none (429). Borg makes the point that diffusion between the control and intervention groups could cause errors and that this makes it difficult to interpret the data. Borg suggests that a strategy to minimise the risk of compensatory rivalry and resentful demoralisation is to provide the control group with something of ‘similar perceived value’ to the intervention group that would not influence the outcomes. In the candidate’s trial this perhaps would have been a good option to use to minimise contamination, and it was a limitation of the trial that this was not considered. A cluster randomised controlled trial design would have been a way to avoid contamination, but this was beyond the scope of the research, practically and financially.

A Delphi exercise was undertaken to reach an expert consensus about contamination in trials undertaken in educational care settings (430). The expert panel produced a list of factors which could lead to contamination in educational trials, and ranked these in order of them
being more or less likely to do so. The conclusion was that the likelihood of contamination was very high if participants worked in the same health care setting, worked at the same geographical site, were linked by social networking, and if the intervention was desirable and easy to transfer. All of these factors were present in the candidate’s trial, with the exception that the intervention was not easy to transfer. Therefore there was a strong possibility that contamination would occur in this trial conducted with a student sample, and the fact that it did occur is consistent with other studies performed under similar conditions.

It is possible that although the results in the candidate’s RCT show that there was no difference between the control and intervention groups, that this is a type 2 error. In other words, the results show there was no difference between the groups, when in reality there actually was a difference (429). It may be that the actual effect was smaller than the one which was estimated in sample size calculations (a change of score by 3 for the PHQ-9, and 2 for the GAD-7). The participants in the candidate’s RCT were recruited from the general medical school year-groups attending lectures, and so were unlikely to contain people with very high levels of mental ill-health. It is likely that any change in mental health scores would have been small, and this perhaps should have been taken into account more when the sample size calculations were performed. Therefore the study may not have been adequately powered to detect difference between the groups (431). If this is the case, then a much larger sample would have been required to show the difference as statistically significantly different. A bigger sample size may have reduced the chances of making a type 2 error. However such a small difference in a PHQ-9 or GAD-7 score may not be of clinical relevance. Therefore the candidate’s intervention perhaps could be tested in a population with higher levels of mental ill-health, for instance by screening students and recruiting those
with higher scores, or a more effective intervention needs to be developed for use in general medical school year groups.

The candidate’s RCT used the same measures on two occasions at baseline and follow up. In the RCT, the results of both the intervention and control groups remained relatively stable throughout the trial at baseline and follow up. It is possible that this was because the participants had ‘learned’ what to put on the questionnaire, and so for the final measures they entered similar scores to their earlier ones. If there were a ‘learning effect’ like this on both groups, it could conceal any effects of the intervention.

Another possible weakness to the trial was the outcome measures that were used. It is possible that there were other aspects of the participants’ mental health and wellbeing that were improved by a peer-led programme, but which were not measured. For instance, the students could have learned new coping skills or been able to form stronger collegial relationships. A final weakness of the RCT was the assessment of adherence, as only some aspects of this were assessed. It has been shown in studies of medication adherence that self-report adherence may differ from actual adherence if not verified from elsewhere (432). Therefore it is possible that higher numbers of people in the control group participated in parts of the intervention than were recorded in the adherence records.

The recruitment and randomisation procedure was both a strength and a limitation in this study. The fact that both procedures were performed back to back made the process very efficient with no attrition, and 275 people were randomised in less than an hour. However as the process had to be done quickly, it involved multiple research assistants handing out questionnaires at different lecture theatre doors simultaneously. This created some problems
with handing out the questionnaires sequentially, which is what should have occurred with block randomisation. This is likely to be the reason that the numbers in the intervention and the control groups were not equal.

However, the randomisation process on the whole worked well and was efficient, and this was one of the strengths of this trial. The demographic and outcome measures were fairly balanced at baseline, and the randomisation process could be said to be adequate. A further strength of the study is that double data entry was performed thus minimising the chances of data entry error. The study was also performed in a ‘real-life situation’ within the existing structure of a medical school programme, which means that it could be replicated in another University.

Adherence to the intervention was assessed, which is a further strength of the study. Participants were asked about their frequency of mindfulness practice, and attendance at the peer-led social occasions. However, adherence to another part of the intervention was only partially assessed. The number of students who approached a peer leader for assistance was assessed only from the point of view of the peer leaders. It was not assessed from the point of view of the participants when collecting data about adherence on the final questionnaire. This procedure was followed because of discussions with the peer leaders, where they stated that it was sometimes difficult to ascertain if someone was approaching them for help in their role of peer leader, or if they were just getting into a more informal chat. The candidate decided to let the peer leaders decide if it was officially a peer leader consultation, and for them to document the number of people who approached them. In retrospect, it would have been more informative to also obtain this data from the participants’ viewpoint as well.
The inclusion of the peer leader training programme as part of the curriculum had benefits, which appeared to outweigh the challenges. It enhanced the recruitment process and increased the visibility and profile of the peer-led programme. The candidate hoped that this would perhaps offset the stigma often associated with mental health programmes that can affect help-seeking behaviour (312). Other types of health and wellbeing programmes have successfully been integrated into medical school programmes (231). It was also a strength of this study as it might encourage peer leaders to attend the training sessions. In addition to this, it solved many of the practical challenges of running the trial such as finding a training venue for the peer leaders and co-ordinating meetings with a group of people, because a regular time-slot and room for training would be provided. The challenges of the peer leader programme being integrated into the curriculum lay in the fact that the peer leaders had to be set assignments. These challenges were addressed by creating a clear separation of the academic compulsory requirements of the peer-leader Medical Humanities group with the optional requirements of participating in a peer-leader role as part of the trial.

The conclusions of the peer intervention trials and their possible implications for future research, practice and policy will be discussed in the following discussion chapter. This chapter consisted of a pilot study to determine the feasibility of three different peer-led interventions in a group of medical students and to explore the experience of being a peer leader and a peer-led participant. This was followed by a randomised controlled trial to determine the effectiveness of a peer-support and peer-taught mindfulness intervention on depression, anxiety, quality of life, resilience scores and academic measures in medical students over a six month period. The findings were that peer-led interventions were acceptable and feasible within the curriculum, but that the intervention was not shown to be
effective in terms of improving quantitative mental health measures or academic self-concept scores. The next chapter will synthesize the findings of the CALM study, the systematic review of peer-led interventions, and the peer intervention trials, and will discuss these findings with reference to the literature. By reflecting on the thesis work as a whole, implications for future research and practice will be discussed, and conclusions drawn.
6 Discussion

“Not sure how psychologists and counsellors do this for a living. It’s exhausting listening to someone share their concerns, feelings, crises, and I think in particular because I still haven’t mastered the art of not feeling for them, as if I’m taking on board their feelings as my own. I do feel liked I have helped her in a way. Like, it was good to see her walk away looking that bit lighter and that bit more purposeful and determined. But extending from that, I think it also helped me as well. Having that human connection, that interaction, made me feel in touch and made me feel human.”

Medical student peer leader (after helping a student who was upset)

6.1 Introduction

This chapter will draw together the four pieces of work that have made up this thesis: the CALM study, the systematic review of peer-led interventions, the peer intervention pilot study and the randomised controlled trial of a peer-support intervention. The three studies and the systematic review will be termed the ‘thesis components’ throughout this chapter. Findings in common will be highlighted. The thesis proposal and research questions for each study will be examined in light of the findings. Key findings of the thesis will be summarised, the thesis strengths and limitations explored, and the research will be discussed in context with the literature. Lastly the candidate will reflect on the broader implications of the work done in the thesis, and will conclude with suggesting possibilities for future research and practice.
6.2 Main Findings

Strong support was found for the proposal that medical students can be empowered to improve their mental health. The three studies and the systematic review were conducted using robust methodologies, which give the findings credibility. In order to summarise the main findings of this thesis, the research questions will be re-visited as shown in Table 6.1:
<table>
<thead>
<tr>
<th>Research Question</th>
<th>Main Findings</th>
</tr>
</thead>
</table>
| What is the prevalence of depression and anxiety in a population of New Zealand medical students? | The prevalence of moderate or moderately severe depression (PHQ-9 ≥ 10) in a population of New Zealand medical students was 14.5%  
The prevalence of moderate or moderately severe anxiety (GAD-7 ≥ 10) in a population of New Zealand medical students was 9%  
A self-care website was acceptable and was used by 25% of the group  
A self-care website was accessed by those students with significantly higher anxiety but not depression scores than those who did not access the site  
The evidence for the effectiveness of peer-led interventions in improving mental health and wellbeing is classified as ‘good’ for secondary students, and ‘satisfactory’ for tertiary students (as per NMHRC levels of evidence)  
Three different peer-led interventions to improve mental health and quality of life in medical students were found to be feasible and acceptable  
The experience of being a peer leader and of being a peer-led participant was extremely positive  
A peer-support and peer-taught mindfulness intervention was not shown to be effective in improving mental health, QOL, resilience scores or academic measures in medical students over a 6 month period compared with current practice |
The studies also provided some additional findings. The CALM study found that students expressed a desire for a more personal approach to the provision of support. The systematic review demonstrated that the majority of studies that have been conducted into peer-led interventions are qualitative or do not use a control group. The peer intervention trials showed that the peer leader training component of the intervention may be time-constrained if it is extra-curricular and that election of peer leaders is feasible and acceptable. The RCT study also demonstrated that face-to-face peer support was used by a quarter of the intervention group. An unexpected finding was that 13% of the control group also increased their mindfulness practice during the trial.

The three trials and the systematic review all found that studies conducted in the area of student mental health and wellbeing, were feasible and acceptable, and received very positive feedback from participating groups of students. Participation numbers were high and rates of attrition were commonly low, even in the peer pilot study, which was conducted in extra-curricular time. This could be interpreted as a sign of interest from the student population, who appear to be motivated to improve their own wellbeing and regard it as an issue of significance (190, 394). Aside from the international literature explored in the systematic review, the three studies conducted by the candidate support this statement, and confirm that it holds true in a New Zealand context with a population of medical students.

The candidate’s CALM study and peer intervention trials also had other findings in common. The prevalence of depression and anxiety, as defined by the PHQ-9 and GAD-7 scores in the baseline measures were very similar across all three studies, which were conducted in 2008, 2010 and 2011 in medical students in Years 2 and 3. Two of these sets of baseline measures were collected at the start of Semester 1 in the Peer Intervention Trials, and one set was
collected in the middle of Semester 2 in the CALM study. Nevertheless, the mean baseline PHQ-9 scores across the three studies only varied between 4.3 and 5.14, and the baseline GAD-7 scores only varied between 3.7 and 4.5. As discussed previously, these scores are very similar to previous depression and anxiety scores found in New Zealand medical students (27).

The uptake of both the CALM website and the face-to-face peer support was exactly the same in the CALM study and in the peer intervention RCT, with 25% of the student group choosing to use the interventions. In both of these studies, the intervention was not widely publicised. In the CALM study this was due to the short trial duration and limited access to the students during that time, and in the RCT the peer support intervention was not promoted to the year-group as a whole, in an effort to minimise influence on the control group or ‘contamination’ of intervention. The candidate surmises that it is likely that student-use of a self-care or peer-led intervention could be even higher than 25%, were the service to be promoted more actively. The importance of maximising the awareness of services to both students and staff was one of the key findings from Storrie’s systematic review of tertiary student mental health initiatives (14).

The systematic review of peer-led interventions undertaken by the candidate showed that peer-led interventions appear to be effective in improving mental health and wellbeing in the student population, when assessing this with quantitative outcome measures. However, the small number of studies included in the review does impact on the strength of this evidence. Furthermore, evidence of effectiveness was not supported by the candidate’s RCT, which showed no significant differences between the control and intervention groups for a range of health and wellbeing measures. Therefore the strength of the evidence regarding the
effectiveness of peer-led interventions for student mental health and wellbeing could not be improved by the results of the candidate’s RCT, and therefore would still be classed as “good” but needing more investigation, as assessed by the systematic review.

Finally, findings from the candidate’s systematic review and RCT emphasised the issue of ‘contagion’. In the peer intervention RCT, there was contamination of the trial, with some of the control group also choosing to undertake components of the intervention. In the most robust study included in the candidate’s systematic review, Wyman’s cluster RCT, peer-leader influence and school culture were a fundamental part of the intervention. The candidate proposes that the underlying mechanisms in both these situations may be similar. A small enclosed environment like a secondary school or medical school will already have its own culture (71), and this could be affected by many factors including stigma, competitiveness and peer pressure (317, 433, 434). Interventions introduced into such an environment may be ‘contagious’. Thinking about the idea of ‘contagion’ in terms of emerging adult theory, the students are in a developmental stage that involves exploration and they may therefore be more open to new concepts such as mindfulness and be keen to experiment with it, regardless of their assigned trial group. In terms of empowerment, one of the issues at the core of this philosophy is the importance and power of groups and communities (53). In the candidate’s view, a medical school could certainly be viewed as a community, and it could be this community spirit that contributes to ‘contagion’. If the concept of ‘contagion’ could be used to disseminate or implement an intervention as in Wyman’s trial, then it could be a helpful phenomenon (329). Exploring the concept of ‘contagion’ in groups of emerging adults as a way of enhancing the uptake of an intervention would be an interesting area for future research.
6.3 Strengths and Limitations of Thesis

The strengths and limitations of each of the individual studies and the systematic review have been addressed in the preceding chapters. However strengths and limitations of the thesis as a whole will be addressed here. A strength of this thesis is that the proposal that medical students can be empowered to improve their own mental health has been explored in some depth and in a logical manner. The CALM study set a solid foundation by documenting the prevalence of mental ill-health in a medical student population, and exploring some aspects of help-seeking behaviour. Furthermore the development of the CALM website created a resource that could be used as a support for both the control and intervention groups in the subsequent studies, and this acted as an extra self-help resource for all participants. The systematic review then built on the CALM study’s finding that some students would prefer a more “personal support”, by examining the strength of evidence for peer-led interventions, and this was followed up by the peer intervention trials, which included a pilot with a control group and a subsequent RCT.

One limitation of the CALM study and the peer intervention studies is that mental health and wellbeing were assessed throughout by questionnaires, and that the focus of these studies was mainly on the interpretation of quantitative data. The systematic review also focussed only on studies that used quantitative outcome measures. There is an argument that it is possible to include both quantitative and qualitative studies in a review of the evidence, and to critically appraise this disparate data in a systematic manner (435). Using only quantitative methodology to conduct research into the area of mental health and wellbeing will provide limited information of a certain type. Can mental health and wellbeing be adequately described by a numerical value? Katschnig et al argue convincingly that it cannot, as they
point out that people with mental ill-health have lower standards when defining their level of quality of life, than people who are in good mental health, and that this may affect the scores they enter on a quantitative questionnaire (436). These authors stress the importance of using additional methodologies, and perhaps for a thesis that focuses on empowerment, the candidate would have been wise to place more of a focus on additional qualitative methodologies and explore the participant experience in more depth (17, 437).

In addition, self-report questionnaires possess an inherent subjectivity and response bias that tends to be attitudinal. Secondly, the RCT study has addressed the reaction and learning phases of evaluation of a peer support intervention as perceived by medical students. According to Kirkpatrick other levels of evaluation could be useful related to behavioural changes and actual results of change such as demonstrable evidence of greater motivation, learning capacity and wellbeing (438).

At this point in a thesis, it is common to move on to discuss the study findings with reference to the wider literature. However many of the findings in this thesis have already previously been compared to the literature, in the discussion sections at the end of each of the study chapters. Rather than re-visiting this debate, the candidate instead would prefer to move straight on to a discussion of the thesis conclusions and implications, and at that point will refer to some different literature of relevance to some of the new ideas and hypotheses that have arisen out of this thesis.
6.4 Thesis Conclusions and Implications for Future Research, Practice and Policy

The work carried out for this thesis demonstrates the feasibility and acceptability of using self-care resources and peer-led interventions to improve mental health and wellbeing in medical students. This contributes to existing literature by being the first randomised controlled trial to assess a peer-led intervention as part of a medical school curriculum to improve student wellbeing. This is an important contribution, as this group of young people have a high risk of developing mental ill-health and often do not access help. This work into their self-care and peer-care has further significance, for medical students are learning to care for others as part of their tertiary education, and their self-care habits have been shown to influence their interactions and safety with patients (36).

The thesis work also illustrates the moderate level of evidence showing the effectiveness of peer-led interventions for secondary and tertiary students, more specifically the research related to the CALM study and the systematic review of the literature. The null findings from the RCT study add valuable information around research feasibility and inherent challenges with ‘real-world’ research. These findings have significance for research and practice in the field, as up to this point, there have been few large scale robust studies conducted in this area, and no systematic reviews have been conducted. Using self-care and peer-led interventions is a way of empowering students, which is congruent with the strength-based approach underpinning work with young people. This thesis highlights the value, acceptability and effectiveness of these approaches.
The candidate’s conclusions from drawing together all four components of the thesis are summarised in Table 6.2. The majority of these conclusions are supported by the findings from the studies in this thesis, and therefore are substantiated by evidence. The remainder of these conclusions could be viewed as new hypotheses, and would need to be confirmed by future research. This table highlights the thesis component that led to the conclusion or new hypothesis, in other words whether it was substantiated or inspired by the systematic review or by one or more of the candidate’s three studies.
# Table 6.2: Conclusions and New Hypotheses from the Thesis

<table>
<thead>
<tr>
<th>Conclusions and New Hypotheses*</th>
<th>Component of the Thesis Leading to This Conclusion</th>
</tr>
</thead>
<tbody>
<tr>
<td>CALM = Computer Assisted Learning for the Mind; SR = systematic review; RCT = randomised control trial</td>
<td>CALM Study</td>
</tr>
<tr>
<td>Medical students may enter different scores to self-complete questionnaires on-line and in-class</td>
<td>X</td>
</tr>
<tr>
<td>A self-care website may be accessed by those students with higher anxiety scores</td>
<td>X</td>
</tr>
<tr>
<td>The prevalence of moderate or moderately severe depression (PHQ-9 ≥ 10) in a population of New Zealand medical students was 14.5%</td>
<td>X</td>
</tr>
<tr>
<td>The prevalence of moderate or moderately severe anxiety (GAD-7 ≥ 10) in a population of New Zealand medical students was 9%</td>
<td>X</td>
</tr>
<tr>
<td>A self-care website and a peer-led intervention were feasible, acceptable, and used by 25% of a medical student group</td>
<td>X</td>
</tr>
<tr>
<td>The evidence for the effectiveness of peer-led interventions in improving mental health and wellbeing is good for secondary students and satisfactory for tertiary students</td>
<td>X</td>
</tr>
<tr>
<td>The experience of being a peer leader and of being a peer-led participant is extremely positive</td>
<td>X</td>
</tr>
<tr>
<td>Students do not state a preference between same-age peer leaders and year-above peer leaders when considering future peer-led programmes</td>
<td>X</td>
</tr>
<tr>
<td>Incorporating a peer leader programme into the medical school curriculum is feasible and could be advantageous*</td>
<td>X</td>
</tr>
<tr>
<td>Election of peer leaders by the other students is feasible and could be advantageous*</td>
<td>X</td>
</tr>
<tr>
<td>Students may prefer to appoint a panel of peer leaders to enable student choice when seeking support, rather than being assigned a designated peer leader*</td>
<td>X</td>
</tr>
<tr>
<td>Enhancing peer leader visibility may be an important aspect of a peer-led intervention*</td>
<td>X</td>
</tr>
<tr>
<td>The culture of a school may have an impact on the uptake and adherence to a peer-led intervention*</td>
<td>X</td>
</tr>
<tr>
<td>Medical students may prefer to have a choice of help-seeking pathways*</td>
<td>X</td>
</tr>
</tbody>
</table>

*Refers to a new hypothesis
Some of the new hypotheses generated from the studies in the thesis have not previously been discussed but will be briefly addressed here. The selection process for peer leaders is an interesting topic as the candidate’s research would indicate that electing the leaders is viable and appeared to be preferable to appointment of leaders for many students. In looking at the wider literature, the selection procedure for peer leaders is not outlined in many of the studies. However, one study by Valente et al did assess the effect of election of peer leaders compared with other methods of appointing leaders, although it was in the area of smoking prevention, rather than in mental health (439). However this was a large study conducted across 84 classrooms in 16 secondary schools, which demonstrated the effectiveness of the election of peer-leaders. Valente’s study had three different arms all delivering the same tobacco-prevention intervention in small groups. One arm was called ‘teacher’ where the peer leaders and groups were created by the teachers, one group was called ‘random’ where the peer leaders were elected and then students were randomly assigned to their group, and one arm was called ‘network’, where the peer leaders were elected and the students were assigned to be in a group led by the leader that they had nominated. The ‘network’ peer leader selection method was shown to be more effective than the other two groups in terms of reducing the intention to smoke.

The issue of enhancing peer leader visibility is part of maximising the promotion of the peer-led programme. Certainly the literature would support the fact that it is vital that students are aware of services (14). From the candidate’s research it appeared that the peer leaders were approached by students for support commonly straight after they had been visibly ‘leading’ a mindfulness session. There are various possible reasons for this. It could be that ‘emerging adults’ prefer to have immediate access to help or it might be that the constraints of a medical
curriculum are such that there are not many convenient times when they could meet (390). Or perhaps after participating in a group the student felt engaged, had developed respect for the leader and had formed a level of rapport. Certainly the qualities of a peer leader are thought to contribute to the effectiveness of an intervention (440).

The issue of student choice has come up three times on the list of new hypotheses. The candidate suggests that students may like to choose from a range of help-seeking options including personal and anonymous care (441), they might prefer to elect their peer leaders thereby choosing their possible support people as in Valente’s study cited above (439), and they might also prefer to have a panel of peer leaders, which would enable a choice for individual people to approach for different problems.

Up to this point, this final discussion chapter has integrated the findings from the candidate’s individual studies and systematic review, and has discussed some of the strengths and limitations of the thesis as a whole. The next part of the chapter will place the whole work in context by contemplating the possible wider impact of empowering medical students to improve their own mental health. To provide a broader perspective, the candidate will re-visit the ‘contextual setting’ diagram, which was presented at the beginning of the thesis. This diagram, shown below in Figure 6.1 illustrates ‘the bigger picture’ and demonstrates the potential relationship of the candidate’s research to many wider factors. Were this diagram to be viewed through the lens of a ‘critical realist’, there could be a multitude of arrows pointing in many directions, as such a viewpoint would suggest that all of these factors could have an impact on each other (442). However for the sake of clarity, the diagram has been presented more simply as a conceptual model to highlight the possible wider impact of empowering medical students, in order to highlight some points for discussion.
**Figure 6.1: A Conceptual Model to Provide a Framework for Discussion: The Possible Impact of Empowering Medical Students to Improve Their Mental Health**

<table>
<thead>
<tr>
<th>Culture/Ethnicity</th>
<th>Family</th>
<th>Media</th>
<th>Society</th>
<th>Patients</th>
<th>Financial Situation</th>
<th>Stigma</th>
<th>Political Environment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Influencing Factors</td>
<td>Pre-Medical School Environment: (Home/school)</td>
<td>Resiliency Skills</td>
<td>Physical Health</td>
<td>Personal Support</td>
<td>Genes and Development</td>
<td>Emotional Intelligence</td>
<td>Personality Traits</td>
</tr>
<tr>
<td>Influencing Factors</td>
<td>Professional Environment: when working as a doctor (In addition to factors listed in ‘Pre-Medical School Environment’)</td>
<td>Reflective Practice and Mindfulness</td>
<td>Professional Support</td>
<td>Social Connection</td>
<td>Meaning, Purpose and Values</td>
<td>Work/Life Balance</td>
<td>Working Environment</td>
</tr>
</tbody>
</table>
There are several possible implications of empowering students to care for themselves and others. It is possible that allowing students to have more responsibility with regards to self-care and peer-care could have positive implications for their health. For instance, autonomy is one of the key concepts behind motivational interviewing, a counselling style used to facilitate health behaviour change. Studies looking into motivational interviewing have shown that enabling and encouraging a person to reflect on their own health behaviour and come up with their own ideas about ways to improve it, may lead to successful behaviour change (353, 443).

Thinking about medical students in particular, there are other possible implications of the work done in this thesis. Figure 6.1 above illustrates that students and doctors need to learn to be reflective practitioners, which involves the cultivation of self-awareness and mindful practice (444, 445). Enabling students to become aware of their own health needs and those of their peers could assist with the development of this key skill (446). Furthermore, it is possible that a peer-led support programme could also enhance students’ empathy. Medical students often learn some of their consultation skills by role-playing scenarios with simulated patients, i.e. actors, or with other students (406, 447). However, these are both artificial situations. As a peer leader in a peer support programme, a medical student will have an opportunity to practice their listening skills in a real-life situation. Furthermore, as the person seeking support will also be a medical student, it is possible that a peer leader could feel a greater sense of connection than they would feel with a patient. The candidate argues that this is a possible opportunity for the peer leader to deepen their understanding and experience of empathy.
Although communication skills training can improve empathy scores in medical students (448), it has been shown that empathy levels decline throughout medical training, the reasons for which are currently unclear (449). One article debating the decline in empathy in medical trainees suggested that perhaps empathy could improve if changes were made to the institutional culture allowing the acceptance of ‘imperfection in self and others’ and enabling ‘shared emotional vulnerability’ (450). This concept of being accepting and kind to self and others is supported by some recent research into ‘self-compassion’ showing that self-compassion is related to wellbeing (287, 288). The candidates proposes that it is possible that a peer-support programme embedded within a medical school curriculum, could enhance this philosophy of increasing compassion and acceptance in a medical school environment.

It is interesting to reflect on how some of these issues may impact on patients. Certainly, it is possible that a self-aware doctor, who is used to both giving and receiving care, may be more aligned to a patient-centred way of working, where there is input from both parties during the consultation, rather than the doctor being ‘an expert’ and the patient, a passive recipient (451). In recent years, there has also been interest in patient ‘self-management’ of conditions (50), which is of course another example of empowerment. Patient empowerment has very much come to the fore in the area of mental health since the recovery model ignited in the early 1990s’ (49). The recovery model is a strength-based approach that empowers patients to take responsibility for their own health and to be more active in terms of their recovery. The focus moves away from diagnosing illness and towards symptom control and goal-setting by the patient. In terms of thinking about this concept on a societal level, if mental ill-health is viewed as a disability, then being treated with respect and equality can be seen as a matter of human rights (452).
In the mental health field, patient-to-patient peer support is part of the recovery approach. This sort of peer support has been correlated with increased self-esteem in individuals (453) and is thought to be helpful in terms of recovering from an episode of serious mental ill-health, reducing stigma and introducing positive social change (454, 455). Online support groups have also been shown to foster empowerment, but a recent review concluded that the evidence is currently unclear about their effectiveness in improving wellbeing (61). However, internet support groups have been thought to be helpful for the provision of peer support in cancer patients (456). There has also been some interest in the idea of peer-support phone calls, to improve both physical and mental health. A systematic review of this topic revealed two studies that showed significant results when compared to control, for an increased uptake in mammography screening (p=0.001), and a decrease in depressive symptomatology (p = 0.01) in women with post-partum depression. The methodology of this review was sound, but the level of evidence found was not strong as many of the studies were not of a high quality (457). However, there is certainly clear evidence to support the effectiveness of peer-support programmes in the community. If peer-support programmes were to become commonplace in medical schools or in universities, it would mean that students could be seen as replicating what is going on in society, in the mini-community of their medical school. Embedding the concepts of self-care and peer-care in medical school may allow students to experience and appreciate the value of peer support, so that they choose to continue to practice collegial support when they qualify. Developing and maintaining connections to others is an important part of wellbeing (388, 441). Professional support structures are recommended for health professionals to maintain their wellbeing and minimize their risk of isolation (35, 74, 458, 459).
Stepping back to examine the overall thesis picture, it is clear that the central theme is one of seeking help as well as providing help, or in other words ‘being cared for’ as well as ‘caring’. There is some literature that highlights the importance of this concept for doctors (221, 460), and it could also be perceived as a human ‘need’. If one were to apply the model of ‘Maslow’s Hierarchy of Needs’ to the concept of ‘caring and being cared for’, Maslow’s model would support the idea that both are important (461). On Maslow’s Hierarchy of Needs, the most basic human needs are at the bottom of the ‘pyramid of needs’. Maslow’s theory was that once the basic needs had been met, then a person would be motivated to advance to the next level, and would then strive to fulfil a higher level of needs. If one were merely to be cared for or looked after by a third party in an entirely passive manner, then they would fulfil their ‘health need’ at the bottom of Maslow’s pyramid. However, when one moves towards an empowerment focus, the responsibility for health improvement shifts on to the person who requires assistance. When this happens, the person who needs help will still fulfil their ‘health need’ on Maslow’s lower level, but they will also proactively seek help, for instance by choosing to use a self-care resource, thereby moving up to the higher levels of the pyramid by fulfilling their needs of ‘confidence’, ‘self-esteem’, ‘achievement’ and ‘problem solving’. Participants and leaders in a peer-led programme will also fulfil additional higher level needs such as “respect of others” and “respect by others”.

Future research into peer-led interventions may benefit from a mixed methods approach to enable a more holistic overview and align with the concept of empowerment by including the student voice. In terms of study design, the candidate would suggest that the peer-led components of future interventions should be clearly delineated and described in reporting. Also simple peer-led interventions may be preferable to ones which have multiple
components, as then the effective element will be clear. One robust way of investigating the effectiveness of a peer-led intervention, would be to compare peer-led programmes to adult-led programmes, as in Pfister’s study but in a larger more generalisable sample (339). There are few comparative studies such as these that examine mental health interventions, as indicated by the results of the candidate’s systematic review, but these types of studies do seem to be more prominent in the area of drug prevention (462-464). For example, a meta-analysis found twelve studies that compared adult-led to peer-led programmes to compare their effectiveness at reducing drug use (440). This meta-analysis concluded that overall, the peer-led programmes appeared to be somewhat more effective in terms of drug prevention, but that the quality of the studies was not optimal.

Another robust study design to consider for looking at peer-led interventions would be a cluster randomised controlled trial using a group of different medical schools. One advantage of this is that it would reduce risk of contamination of intervention and provide strong evidence that peer-led interventions could improve mental health, were it to be effective. Also with regard to the previous discussion about ‘contagion’, it may be that the environment is a key factor and that a population health approach is optimal by placing the focus on interventions that change the atmosphere, culture and group norms, rather than those that focus on individuals.

Therefore, there are many potential avenues for future research in this area. The CALM study and the peer intervention trial could be the first projects in the candidate’s proposed ‘EMPOWER’ programme of research (Empowering Medical Professionals to Optimise Wellbeing by Enabling Resources). Peer-led interventions may also be the way to implement theory into practice. If respected peers embrace effective interventions, lead services and
model healthy behaviour, then perhaps this could change the culture, reduce stigma and create a new normality where to be proactive and seek to improve one’s own health and wellbeing is perceived as resourceful and successful.

The candidate believes that an empowerment approach can equip medical students with helpful attitudes and skills to meet the challenges of a life in medicine. With cultivated self-awareness, a healthy approach to seeking help, and a toolbox of techniques that can be expanded throughout the years ahead, they may be better prepared to cope with the demands of their future career. It is time to hand over the mantle and support students by empowering them to be self-sufficient. This will enable them to take control, to maximise their stress-resistance and to learn ways to buffer and enhance their personal and professional lives. Then perhaps we will have given them the best chance to thrive, from the first medical school exam to the last patient consultation.

‘It made me realise that all of us have so much going on, all of us have things that are on our minds and upsetting us which don’t seem obvious at all to other people. I mean I look at ‘A’ and ‘B’..... and they just seem so perfect, so held together, so ‘okay’ with everything. It was really profound to realize that even all those people that are coping so well with life have got things going on, have things that they are struggling to deal within their lives. As much as it was a shocking revelation for me, I think that it is also going to be a really helpful realization. I think it means I will not be as harsh on myself, or think that I am so much less equipped or less able as a person, when I come across situations or times in my life where I am not managing very well. And I think that if I
manage not to punish myself or reflect negatively on myself in those times when I am already down and dealing with a crisis, then I think I can be happier and cope better with obstacles in my life. To think that having crises at times does not mean that I am less of a functioning human being is life-changing really.'

Medical student quote (after a peer leader training session exploring crisis situations)
7 Afterword

Between January 2009 and January 2013, the CALM website was accessed by 58,217 people, from 150 different countries, 46% of whom made a return visit. The website is now linked to The National New Zealand Depression Initiative, and to many University websites around the world.

The peer intervention pilot study won the award for ‘best poster’ at The European Association of Physician Health conference in Barcelona in 2010.

A new Health and Wellbeing curriculum has been included in all the years of the undergraduate medical programme at the Auckland medical school, and is being run by the candidate. A peer leader training programme may also be incorporated into the Auckland medical school curriculum.

A pastoral care sub-committee has been set up to look after the welfare of all medical students at The University of Auckland.
Appendix 2: CALM Study Consent Form

PARTICIPANT CONSENT FORM

THIS CONSENT FORM WILL BE HELD FOR A PERIOD OF TEN YEARS

CALM: Computer Assisted Learning for the Mind
A Self Care Package for Medical Students

Researcher: Researcher; Dr Fiona Moir MBChB, MRCGP
Senior Tutor in Mental Health, Dept of General Practice, University of Auckland

<table>
<thead>
<tr>
<th>Language</th>
<th>Interpretation</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>English</td>
<td>I wish to have an interpreter.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maori</td>
<td>E hiahia ana ahau ki tetahi kaiwhakamaori/kaiwhaka pakeha korero.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cook Island</td>
<td>Ka inangaro au i tetai tangata uri reo.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fijian</td>
<td>Au gadreva me dua e vakadewa vosa vei au</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Niuean</td>
<td>Fia manako au ke fakaaoga e taha tagata fakahokohoko kupu.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Samoan</td>
<td>Ou te mana’o ia i ai se fa’amatala upu.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tokelaun</td>
<td>Ko au e fofou ki he tino ke fakaliliu te gagana Peletania ki na gagana o na motu o te Pahefika</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tongan</td>
<td>Oku ou fiema’u ha fakatonulea.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

I have read and I understand the information sheet dated October 2007 for volunteers taking part in the research designed to provide computerised self care resources for medical students. I have been given and have understood the explanation of this research project. I have had an opportunity to ask members of the research team questions about the study and
I am satisfied with the answers I have been given. I have had the opportunity to use whanau support or a friend to help me ask questions and understand the study.

I understand that taking part in this study is voluntary and that this will in no way affect my academic progress.

I understand that my participation in this study is confidential and that no material which could identify me will be used in any reports on this study. I understand that the data from this research will be stored, separately from the signed consent forms, for a period of ten years in order to produce publications and/or develop aspects of the research further.

I understand that the information gathered from the website will be summarised in a report that will be given to all medical students in the 4th and 5th year in 2008 at The University of Auckland.

I wish to receive a copy of the results YES/NO

I agree to take part in this research.

Signed:

Name (please print clearly):

Date:

For ethical concerns contact: The Chair, The University of Auckland Human Participants Ethics Committee, Office of the Vice Chancellor, Private Bag 92019, Auckland. Tel: 09 373 7599 Extn. 87830.

Approved by the University of Auckland Human Participants Ethics Committee for 3 years on 18/6/08 Reference number 2008/216
Appendix 3: CALM Study Participant Information Sheet

The University of Auckland
Private Bag 92019
Auckland
New Zealand,
Dept of General Practice and Primary Health Care
Tamaki Campus, Morrin St, Glen Innes
www.health.auckland.ac.nz
Telephone: 64 9 373 7599 extn 84473
Facsimile: 64 9 373 7624
Email: f.moir@auckland.ac.nz

PARTICIPANT INFORMATION SHEET FOR 4TH AND 5TH YEAR MEDICAL STUDENTS

CALM: Computer Assisted Learning for the Mind
A Self Care Package for Medical Students

Researcher; Dr Fiona Moir MBChB, MRCGP
Senior Tutor in Mental Health, Dept of General Practice, University of Auckland

To: Participants
You are invited to take part in a study that will provide computerised self care resources for medical students. A new self-care website will be available from 30/06/2008, and you are invited to use this website at any time during a 6 to 12 week period. You and other participants have been nominated, as you are in the 4th or 5th year at medical school at The University of Auckland in 2008. Your participation is voluntary - you do not have to take part in this research. Your decision to take part or not, will not affect your academic progress.

There are five specific aims of the project:
1. To find out what proportion of medical students will use an on-line self-care package over a 6-12 week period.
2. To find out which medical students choose to use the self-care package
3. To find out which parts of the self-care package students choose to use
4. To find out how acceptable and easy to use the self-care package is
5. To find out the levels of depression and unhappiness in the students who use the website compared to the whole of the 4th and the 5th year.

There are high levels of depression, anxiety and substance use in medical students worldwide, and many medical students are under-treated. This study aims to provide students with easy and free access to resources that could help them to get well and stay well.
The study will ask you to complete one initial 7-question questionnaire on happiness and depression, which will be completed in a lecture. If you then choose to visit the website, you will be asked to give your consent, to identify your ethnicity, gender and age, and to fill in one initial 7-question questionnaire on happiness and depression, before any of the other resources can be accessed. There will be optional questionnaires on depression, anxiety, alcohol and drug use and mental resiliency which you can fill in, along with information on how to score and interpret these questionnaires. There will be podcasts and readings about managing stress: progressive muscle relaxation, self-hypnosis, gratitude and compassion exercises and mindfulness meditation. Different religious and cultural perspectives will be included as well as links to other relevant on-line resources.

The website is entirely anonymous, and there will be nothing which could personally identify you regarding your responses to the questionnaires.

The information regarding your ethnicity, gender, age and your scores from the questionnaires will be sent automatically to the researcher, along with information about which self-care podcasts and reading you accessed.

Dr Fiona Moir is a researcher from the University of Auckland undertaking the above titled research project. The research is funded by a Teaching Improvement Grant and by a grant from The Learning Technology Unit from The University of Auckland.

All written data from this project will be kept in a locked location at the University of Auckland and shredded 10 years after completion of the study. Any information stored on computer files will be kept on the University of Auckland server that requires a password for access.

Fiona Moir will present the preliminary results from this project to all 4th and 5th year medical students at The University of Auckland in 2008 at the end of the 12 week period. All students will be asked to complete the 7 question-questionnaire at this end-point of the study. If feasible, the results will also be published in academic journals.

If you decide to take part in the research we will ask you to complete a consent form when you access the website. All consent forms will be stored separately from information provided by participants.

If you would like to take part in this project, please go to the website: URL ……

If you have any questions or wish to know more about the study please contact us using the details below.

<table>
<thead>
<tr>
<th>Principal Investigator</th>
<th>Supervisor</th>
<th>Head of Department</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fiona Moir</td>
<td>C.Raina Elley</td>
<td>Prof Bruce Arroll</td>
</tr>
<tr>
<td>Phone: 09 373 7599 Extn 84473</td>
<td>Phone: 3733999 Extn 86523 <a href="mailto:c.elley@auckland.ac.nz">c.elley@auckland.ac.nz</a></td>
<td>Phone: 09 373 7599 Extn 86978 <a href="mailto:b.arroll@auckland.ac.nz">b.arroll@auckland.ac.nz</a></td>
</tr>
</tbody>
</table>

For any queries regarding ethical concerns you may contact: The Chair, The University of Auckland Human Participants Ethics Committee, Office of the Vice Chancellor, Private Bag 92019, Auckland 1142. Tel: 09 373 7599 Extn. 83711.

Approved by the University of Auckland Human Participants Ethics Committee for 3 years on 18/6/08 Reference number 2008/216
## Appendix 4: CALM Study Questionnaire

**CALM QUESTIONNAIRE FOR 2nd YEAR MEDICAL STUDENTS (FIONA MOIR 2008)**

Unique Identifier: ___________________  Sex: Male / Female  Age: _____  Ethnicity: __________

Over the last 2 weeks, how often have you been bothered by any of the following:

<table>
<thead>
<tr>
<th></th>
<th>Not at all</th>
<th>Several days</th>
<th>More than half the days</th>
<th>Nearly every day</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Little interest or pleasure in doing things?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Feeling down, depressed or hopeless?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Trouble falling or staying asleep, or sleeping too much?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Feeling tired or having little energy?</td>
<td></td>
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<td>5</td>
<td>Poor appetite or overeating?</td>
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<td>6</td>
<td>Feeling bad about yourself-or that you are a failure or have let yourself or your family down?</td>
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<td>7</td>
<td>Trouble concentrating on things such as reading the newspaper or watching television?</td>
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<td>8</td>
<td>Moving or speaking so slowly that other people could have noticed? Or the opposite-being so fidgety or restless that you have been moving around a lot more than usual?</td>
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<td>9</td>
<td>Thoughts that you would be better off dead or of hurting yourself in some way?</td>
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<td>10</td>
<td>Feeling nervous, anxious or on edge?</td>
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<td>11</td>
<td>Not being able to stop or control worrying?</td>
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<tr>
<td>12</td>
<td>Worrying too much about different things?</td>
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<tr>
<td>13</td>
<td>Trouble relaxing?</td>
<td></td>
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<td>14</td>
<td>Being so restless that it is hard to sit still?</td>
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<tr>
<td>15</td>
<td>Becoming easily annoyed or irritable?</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>16</td>
<td>Feeling afraid as if something awful might happen?</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Did you access the CALM website over the past 2 months? Yes / No
If yes: do you have any comments about the website?
If no: Why didn’t you access it?

THANK YOU FOR TAKING THE TIME TO COMPLETE THIS QUESTIONNAIRE
Appendix 5: Oxford Peer Leader Training Programme List of

Contents

Peer Support
In Colleges and Universities
A Training Manual

Second Edition (revised)

Anne Ford, Peer Support Coordinator
Student Counselling Service
Oxford University

List of Contents (printed with permission of Anne Ford)
Full manual available from anne.ford@counselling.ox.ac.uk

Session 1: Introduction to peer support training

Session 2: Getting to know a stranger
   Effective questioning
   Welcoming and non-welcoming behaviours

Session 3: Non-verbal communication
   Identifying and labelling feelings
   Listening

Session 4: Sharing a concern
   Advice giving vs. active listening
   Decision-making
   Values clarification

Session 5: Communicating with different generations
   Difficult authorities

Session 6: Assertive communication

Session 7: Families

Session 8: Family concerns
   Cultural awareness and stereotypes

Session 9: Crisis awareness
   Listening

Session 10: Suicide prevention education
   Referrals
   Limit-setting
   Boundaries
Appendix 7: Peer Pilot Study Consent Form for Questionnaires

To: Dr Fiona Moir, Senior Lecturer, Department of General Practice and Primary Healthcare

CONSENT FORM
THIS FORM WILL BE HELD FOR A PERIOD OF 6 YEARS

THE PROJECT TITLE:
Peer-teaching of relaxation and peer support to improve mental health and wellbeing in medical students: A pilot study

Name of Researcher: Dr Fiona Moir, Senior Lecturer, Department of General Practice and Primary Healthcare, University of Auckland, Auckland, New Zealand

I have read the Participant Information Sheet and have understood the nature of the research. I have had the opportunity to ask questions and have them answered to my satisfaction. I realise that permission has been sought from the Phase 1 Co-ordinator. I am aware that any publications resulting from this research will be provided via CECIL.

- I agree to take part in this research, which involves 15 minutes of questionnaires at the start and end of the study. Depending on which group I am in, I may be attending approximately three 30-minute group sessions with student peers. If voted as peer leader and I accept, I will attend training for 10 hours at a time that suits.
- I understand that my taking part in this study is voluntary and that material, which could identify me, will not be used in any reports related to this study.
- I am aware that I do not have to answer all of the questions and I may refrain from answering any more questions and I may leave the focus group at any time and that information once given cannot be withdrawn.
- If I agree to participate in a focus group, I will not disclose anything discussed.
- I understand that no audiotapes are to be made from the session.
- I understand that data will be kept for 6 years, after which they will be destroyed.
- I am aware that there will be no negative impact on my study grades if I decide not to participate in the study.
- I understand that at the end of the completion of the research all data will be deleted and paper copies of any notes will be confidentially recycled.

Name __________________________
Signature ______________________ Date ______________

Contact e-mail __________________ Contact phone number

APPROVED BY THE UNIVERSITY OF AUCKLAND HUMAN PARTICIPANTS ETHICS COMMITTEE ON 15/7/2003 3 YEARS REFERENCE NUMBER 2010/275
Appendix 8: Peer Pilot Study Participant Information Sheet for Questionnaires

Information Sheet for Participants

Researchers: Dr Fiona Meir, Senior Lecturer, Department of General Practice and Primary Healthcare; Dr Reina Elley, Senior Lecturer, Department of General Practice and Primary Healthcare; Dr Marcus Hamming, Centre for Medical and Health Sciences Education, University of Auckland

Medical students have been found to have high rates of depression and anxiety, in comparison to other people the same age, but often do not seek professional help. This study will trial different types of interventions to improve mental health, using peers to provide relaxation training and support. Permission has been sought from the Phase 1 Coordinator who supports this research and believes it is of value and interest.

If you consent to participate, you will be invited to attend the randomisation meeting where you will firstly be asked to fill in an anonymous questionnaire about depression, anxiety, quality of life, and help-seeking behaviour, which will take about 15 minutes to complete. Then all participants will vote for ‘peer-group leaders’ for the study. The remaining participants will be allocated into 4 groups:

- Relaxation Only Group (ROG): peer-taught relaxation led by 2 student leaders
- Support Only Group (SOG): peer-support led by 2 student leaders
- Support and Relaxation Group (SARG): peer-taught relaxation and peer-support led by 2 student leaders
- Control Group (CG): access to CALM website (available to all class members)

Peer Group leader training: The elected group leaders will undergo a training programme with the researcher that includes listening skills, group facilitation, setting and maintaining boundaries, confidentiality and safety issues. They will be instructed to contact the researcher or student health counsellors with any concerns, and will also be given information about after-hours mental health services. Some peer leaders will also be taught how to run a relaxation exercise (ROG and SARG), and some will be taught how to be peer support leaders (SOG and SARG). The peer leader training will take approximately 18 hours.

Relaxation interventions: Students participating in relaxation groups (ROG and SARG) will be asked to attend a 30 minute meeting with their group every 2-3 weeks for the duration of the study. During the meetings, the group leader will facilitate a relaxation session (using a recorded relaxation exercise). They will also be asked to do some relaxation practice at home.

Support only intervention (SOG). The people in this group will have one introductory meeting with their group leaders, but otherwise they will have no regular meetings. They will be asked to contact their peer-support leader if they have any issues they wish to discuss on an one to one basis. The peer-support leader will be asked to send them a group e-mail every 2-3 weeks to remind them that they are available should the need arise.

At the conclusion of the study at the end of Semester 2, all participants will be asked to complete the questionnaire again (15 minutes). Participants have the right to withdraw from the intervention groups or from the role of peer group leader, at any time. Some participants may be invited to be part of focus groups, for which there will be separate information and consent forms.

Your name will not appear in any reports or subsequent publications, and your responses will not be identifiable. There will be no negative impact on your study grades if you decide not to participate in the study. All study participants will receive a $20 mobile phone top-up card to reimburse them for their time in attending the randomisation meeting, and for participating in the intervention or control groups. Those selected as peer-group leaders will receive a further $40 mobile phone top-up card to reimburse them for their time in attending the group leader training sessions. This study will provide greater insight into peer-led interventions to improve mental health, and will benefit medical students here and internationally. As a participant you will likely benefit by raising your awareness around the area of relaxation training, peer-support and peer-teaching. Results and publications from this research will be made available via CECEL.
Data storage and privacy:
The consent forms will be stored separately from the questionnaires. No identifiable information will be used during analysis or write-up. Information will only be used for the research and not made available to any medical school or other parties.

There are no physical or psychological risks involved in this procedure. However, the health and counselling service is available if you wish to seek independent assistance related to your wellbeing. Counsellors Catherine Cookson and Kimberly Farmer are aware of the study and can provide assistance if required. The individual results of the questionnaires and responses are anonymous. Data will be stored for a period of 6 years. At the end of the completion of the research all data will be deleted and paper copies of questionnaires confidentially recycled.

Funding
Dr Fiona Moir is the recipient of a University of Auckland Doctoral Scholarship

If you have questions associated with this study you may contact Dr Fiona Moir (09-3737599 ext. 84473 or email: f.moir@auckland.ac.nz)

The contact information for the head of department for the University of Auckland researcher is: Professor Bruce Arroll, Department of General Practice and Primary Healthcare, Auckland, New Zealand. Email: b.arroll@auckland.ac.nz or 09373 7599 ext. 86978.

For any queries regarding ethical concerns you may contact the Chair, The University of Auckland Human Participants Ethics Committee, The University of Auckland, Office of the Vice Chancellor, Private Bag 92019, Auckland 1142. Telephone 09 373-7599 extn. 83711.

APPROVED BY THE UNIVERSITY OF AUCKLAND HUMAN PARTICIPANTS ETHICS COMMITTEE ON 15/7/10 FOR 3 YEARS REFERENCE NUMBER 2010/275
Appendix 9: Peer Pilot Study Consent Form for Focus Groups

To: Dr Fiona Moir, Senior Lecturer, Department of General Practice and Primary Healthcare

CONSENT FORM
(for focus group volunteers)

THIS FORM WILL BE HELD FOR A PERIOD OF 6 YEARS

THE PROJECT TITLE:
Peer-teaching of relaxation and peer support to improve mental health and wellbeing in medical students: A pilot study

Name of Researcher: Dr Fiona Moir, Senior Lecturer, Department of General Practice and Primary Healthcare, University of Auckland, Auckland, New Zealand.

I have read the Participant Information Sheet and have understood the nature of the research. I have had the opportunity to ask questions and have them answered to my satisfaction. I realise that permission has been sought from the Phase 1 Co-ordinator. I am aware that any publications resulting from this research will be provided via CECIL.

- I agree to take part in this research that will take about 60-90 minutes of my time.
- I understand that my taking part in this study is voluntary and that material, which could identify me, will not be used in any reports related to this study.
- I am aware that I do not have to answer all of the questions and I may refrain from answering any more questions and I may leave the focus group at any time and that information once given cannot be withdrawn.
- I agree to not disclose anything discussed in the focus group.
- I understand that no audiotapes are to be made from the session.
- I understand that data will be kept for 6 years, after which they will be destroyed.
- I am aware that there will be no negative impact on my study grades if I decide not to participate in the study.
- I understand that at the end of the completion of the research all data will be deleted and paper copies of any notes will be confidentially recycled.

Name_________________________
Signature______________________ Date________________________

Contact e-mail__________________ Contact phone number__________________

APPROVED BY THE UNIVERSITY OF AUCKLAND HUMAN PARTICIPANTS ETHICS COMMITTEE ON 15/7/10 FOR 3 YEARS REFERENCE NUMBER 2010/275
Appendix 10: Peer Pilot Study Participant Information Sheet for Focus Groups

Information Sheet for Participants
(Focus Groups)

Peer-teaching of relaxation and peer support to improve mental health and wellbeing in medical students: A pilot study

Researchers: Dr Fiona Moir, Senior Lecturer, Department of General Practice and Primary Healthcare; Dr Elena Elloy, Senior Lecturer, Department of General Practice and Primary Healthcare; Dr Marcus Hamling, Centre for Medical and Health Sciences Education, University of Auckland

Medical students have been found to have high rates of depression and anxiety, in comparison to other people the same age, but often do not seek professional help. This study will be trialling different types of intervention to improve mental health, using peers to provide relaxation training and support. Permission has been sought from the Phase 1 Coordinator who supports this research and believes it is of value and interest.

Taking part in this study is entirely voluntary. You do not have to take part in this study. It will take about 60-90 minutes of your time. If you would like to take part in this study, the researcher would like to interview you as part of a focus group. The focus group aims to record your commentaries about your experiences as a peer group leader or as part of a peer-led group or control group. You do not have to answer all of the questions and you may refrain from answering any more questions and you may leave the focus group at any time, although information once given cannot be withdrawn. Written records of the consent of this group will be glanced and individual commentaries will not be identified. Your name will not appear in any reports or subsequent publications, and your responses will not be identifiable. However, it is acknowledged that you may be identified as a participant at the physical setting but this will not be recorded. Information will only be used for the research and will not be made available to any medical school or other parties. There will be no negative impact on your study grades if you decide not to participate in the study.

This study will provide greater insight into peer-led interventions to improve mental health, and may benefit medical students locally and internationally. As a participant you will likely benefit by raising your awareness around the areas of relaxation training and peer support and teaching. Results and publications from this research will be made available via CECIL.

There are no physical or psychological risks involved in this procedure. However, the health and counselling service is available if you wish to seek independent assistance related to your wellbeing. Counselors Catherine Cookson and Kimberly Farmer are aware of the study and can provide assistance if required. Data will be stored for a period of 6 years. At the end of the completion of the research all data will be deleted and paper copies of questionnaires confidentially recycled.

Funding
Dr Fiona Moir is the recipient of a University of Auckland Doctoral Scholarship

If you have questions associated with this study you may contact Dr Fiona Moir (09.3737599 ext. 84473 or email: fmoir@auckland.ac.nz)

The contact information for the head of department for the University of Auckland researcher is Professor Bruce Arroll, Department of General Practice and Primary Healthcare, Auckland, New Zealand. Email: b.arroll@auckland.ac.nz or 09.3737599 ext. 86978.

For any queries regarding ethical consent you may contact the Chair, The University of Auckland Human Participants Ethics Committee, The University of Auckland, Office of the Vice Chancellor, Private Bag 92019, Auckland 1142. Telephone 09 373-7599 extn. 83711.

APPROVED BY THE UNIVERSITY OF AUCKLAND HUMAN PARTICIPANTS ETHICS COMMITTEE ON 19/7/10 FOR 3 YEARS REFERENCE NUMBER 2010/275
Appendix 11: Peer Pilot Study Final Questionnaire

Gender: Male / Female

Age: ______

Ethnicity: Which ethnic groups do you belong to? Please circle Yes or No to each of the following options:

- New Zealand European   Yes  No
- Maori                  Yes  No
- Samoan                 Yes  No
- Cook Island Maori     Yes  No
- Tongan                Yes  No
- Niuean                 Yes  No
- Chinese                Yes  No
- Indian                Yes  No
- Other (such as Dutch, Japanese, Tokelauan) Yes  No

If Other, please specify ____________________________

(PhQ-9 Questionnaire):

<table>
<thead>
<tr>
<th>Over the last 2 weeks, how often have you been bothered by any of the following:</th>
<th>Not at all</th>
<th>Several days</th>
<th>More than half the days</th>
<th>Nearly every day</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Little interest or pleasure in doing things?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 Feeling down, depressed or hopeless?</td>
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<tr>
<td>3 Trouble falling or staying asleep, or sleeping too much?</td>
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<tr>
<td>4 Feeling tired or having little energy?</td>
<td></td>
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<td></td>
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<tr>
<td>5 Poor appetite or overeating?</td>
<td></td>
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</tr>
<tr>
<td>6 Feeling bad about yourself or that you are a failure or have let yourself or your family down?</td>
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<tr>
<td>7 Trouble concentrating on things such as reading the newspaper or watching television?</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>8 Moving or speaking so slowly that other people could have noticed? Or the opposite—being so fidgety or restless that you have been moving around a lot more than usual?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9 Thoughts that you would be better off dead or of hurting yourself in some way?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10 If you checked off any problems—how difficult have these problems made it for you to do your work or take care of things at home?</td>
<td>Not difficult at all</td>
<td>Somewhat difficult</td>
<td>Very difficult</td>
<td>Extremely difficult</td>
</tr>
</tbody>
</table>
(GAD-7 Questionnaire):

Over the last 2 weeks, how often have you been bothered by any of the following:

<table>
<thead>
<tr>
<th></th>
<th>Not at all</th>
<th>Several days</th>
<th>More than half the days</th>
<th>Nearly every day</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Feeling nervous, anxious or on edge?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Not being able to stop or control worrying?</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>3</td>
<td>Worrying too much about different things?</td>
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<tr>
<td>4</td>
<td>Trouble relaxing?</td>
<td></td>
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<td>5</td>
<td>Being so restless that it is hard to sit still?</td>
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<td></td>
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<tr>
<td>6</td>
<td>Becoming easily annoyed or irritable?</td>
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<tr>
<td>7</td>
<td>Feeling afraid as if something awful might happen?</td>
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</tbody>
</table>

(Help-Seeking Questionnaire):

Please tick the answer that best matches your response to each statement:

<table>
<thead>
<tr>
<th></th>
<th>Strongly Disagree</th>
<th>Moderately Disagree</th>
<th>Slightly Disagree</th>
<th>Neither Agree or Disagree</th>
<th>Slightly Agree</th>
<th>Moderately Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>I would talk with a Counsellor or Psychologist</td>
<td></td>
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<tr>
<td>2</td>
<td>I would talk with another medical student</td>
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<tr>
<td>3</td>
<td>I would talk with my family</td>
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<td>4</td>
<td>I would talk with a member of the academic staff</td>
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<td></td>
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<tr>
<td>5</td>
<td>I would talk with one of my clinical teachers</td>
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<td></td>
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<tr>
<td>6</td>
<td>I would talk with my Spiritual or Religious Advisor</td>
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</tr>
<tr>
<td>7</td>
<td>I would talk with my Cultural Advisor</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>I would talk with someone else</td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

P. Haggard, 2004
THE WORLD HEALTH ORGANIZATION
QUALITY OF LIFE (WHOQOL) - BREF
The World Health Organization Quality of Life (WHOQOL)-BREF

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## WHOQOL-BREF

The following questions ask how you feel about your quality of life, health, or other areas of your life. I will read out each question to you, along with the response options. Please choose the answer that appears most appropriate. If you are unsure about which response to give to a question, the first response you think of is often the best one.

Please keep in mind your standards, hopes, pleasures and concerns. We ask that you think about your life in the last four weeks.

<table>
<thead>
<tr>
<th></th>
<th>Very poor</th>
<th>Poor</th>
<th>Neither poor nor good</th>
<th>Good</th>
<th>Very good</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. How would you rate your quality of life?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Very dissatisfied</th>
<th>Dissatisfied</th>
<th>Neither satisfied nor dissatisfied</th>
<th>Satisfied</th>
<th>Very satisfied</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. How satisfied are you with your health?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

The following questions ask about how much you have experienced certain things in the last four weeks.

<table>
<thead>
<tr>
<th></th>
<th>Not at all</th>
<th>A little</th>
<th>A moderate amount</th>
<th>Very much</th>
<th>An extreme amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>3. To what extent do you feel that physical pain prevents you from doing what you need to do?</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>4. How much do you need any medical treatment to function in your daily life?</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>5. How much do you enjoy life?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>6. To what extent do you feel your life to be meaningful?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Not at all</th>
<th>A little</th>
<th>A moderate amount</th>
<th>Very much</th>
<th>Extremely</th>
</tr>
</thead>
<tbody>
<tr>
<td>7. How well are you able to concentrate?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>8. How safe do you feel in your daily life?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>9. How healthy is your physical environment?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>
The following questions ask about how completely you experience or were able to do certain things in the last four weeks.

<table>
<thead>
<tr>
<th></th>
<th>Not at all</th>
<th>A little</th>
<th>Moderately</th>
<th>Mostly</th>
<th>Completely</th>
</tr>
</thead>
<tbody>
<tr>
<td>10. Do you have enough energy for everyday life?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>11. Are you able to accept your bodily appearance?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>12. Have you enough money to meet your needs?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>13. How available to you is the information that you need in your day-to-day life?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>14. To what extent do you have the opportunity for leisure activities?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Very poor</th>
<th>Poor</th>
<th>Neither poor nor good</th>
<th>Good</th>
<th>Very good</th>
</tr>
</thead>
<tbody>
<tr>
<td>15. How well are you able to get around?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Very dissatisfied</th>
<th>Dissatisfied</th>
<th>Neither satisfied nor dissatisfied</th>
<th>Satisfied</th>
<th>Very satisfied</th>
</tr>
</thead>
<tbody>
<tr>
<td>16. How satisfied are you with your sleep?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>17. How satisfied are you with your ability to perform your daily living activities?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>18. How satisfied are you with your capacity for work?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>19. How satisfied are you with yourself?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>
20. How satisfied are you with your personal relationships?  | 1 | 2 | 3 | 4 | 5
21. How satisfied are you with your sex life?  | 1 | 2 | 3 | 4 | 5
22. How satisfied are you with the support you get from your friends?  | 1 | 2 | 3 | 4 | 5
23. How satisfied are you with the conditions of your living place?  | 1 | 2 | 3 | 4 | 5
24. How satisfied are you with your access to health services?  | 1 | 2 | 3 | 4 | 5
25. How satisfied are you with your transport?  | 1 | 2 | 3 | 4 | 5

The following question refers to how often you have felt or experienced certain things in the last four weeks.

<table>
<thead>
<tr>
<th></th>
<th>Never</th>
<th>Seldom</th>
<th>Quite often</th>
<th>Very often</th>
<th>Always</th>
</tr>
</thead>
</table>
26. How often do you have negative feelings such as blue mood, despair, anxiety, depression?  | 5     | 4      | 3           | 2          | 1      |

Do you have any comments about the assessment?

____________________________________________________________________

[The following table should be completed after the interview is finished]

<table>
<thead>
<tr>
<th>Domain</th>
<th>Equations for computing domain scores</th>
<th>Raw score</th>
<th>Transformed scores*</th>
</tr>
</thead>
<tbody>
<tr>
<td>27.</td>
<td>(6-Q3) + (6-Q4) + Q10 + Q15 + Q16 + Q17 + Q18</td>
<td>a. = b: c:</td>
<td></td>
</tr>
<tr>
<td>28.</td>
<td>Q5 + Q6 + Q7 + Q11 + Q19 + (6-Q26)</td>
<td>a. = b: c:</td>
<td></td>
</tr>
<tr>
<td>29.</td>
<td>Q20 + Q21 + Q22</td>
<td>a. = b: c:</td>
<td></td>
</tr>
<tr>
<td>30.</td>
<td>Q8 + Q9 + Q12 + Q13 + Q14 + Q23 + Q24 + Q25</td>
<td>a. = b: c:</td>
<td></td>
</tr>
</tbody>
</table>

* See Procedures Manual, pages 13-15
Appendix 12: Peer Pilot Study Final Focus Group Questions

Peer Teaching of Relaxation and Peer Support to Improve Mental Health and Wellbeing in Medical Students: A Pilot Study; Dr Fiona Moir; 2010

FOCUS GROUP INSTRUCTIONS

(Adapted from: http://www.ntlf.com/html/pi/9705/sgid.htm#sgid)

Group behaviour and ground rules will be set at the beginning of the meeting (e.g., http://www.kcdc.org/documents/Creating%20Ground%20Rules.pdf) to ensure confidentiality and mutual respect.

There will be 5 different focus groups: 4 intervention groups (including the control group), and 1 peer group leader group. Some questions will be common to all groups, and other questions will be specific to a particular group. The process will be the same for all of the focus groups:

For the first 10-20 minutes
The students will be asked to write individually on the topics (and to give examples where appropriate). They will be asked to make as many descriptors as they feel necessary. Students’ notes (no identifiable names will be recorded) will be collected after the session.

For the next 20-30 minutes
Students will be put into small groups (or pairs) to discuss these topics further. For each of the topics they will be asked to briefly describe their ideas. After all members of the group have spoken about their ideas, the students will ideally come up with 2-3 main points for each of the topics, with the group reaching consensus on the points. Small group notes will be collected.

For the final 30-40 minutes
All points of view are brought back to the large group so that discussion of these topics can ensue further.

The aim of this discussion is to come to consensus on the most important points for the above topics. After consensus has been achieved these main points will be reviewed by the researcher in terms of emerging themes. The outcome of the discussion will be recorded by the researcher.

Questions/Topics:

For All Groups:
What did you think about the study?

Specifically
what did you think about the Informed Consent?
the randomisation process?
the questionnaires?
the process of selecting peer leaders?
For Peer Leaders:

What did you think of the peer-leader training programme? What should have been included/excluded from the training?

What did you think about providing peer support/relaxation training?

What did you think about the resources you were provided with as a peer leader?

How did you feel about the level of support available to you as a peer leader?

How did you find the time commitment of being a peer leader? What did you think about the time spent in training? How much time did you spend in your role as peer leader with individual students?

Describe how confident you feel about being able to provide support for other students? What affected your level of confidence?

Describe if this experience has had an impact on your medical training?

Is there anything else you have discovered from your experience of being a peer-leader?

Is there anything else you would like to add?

For Group Participants:

What did you think about peer taught relaxation/peer support?

What did you think about the experience of being in a peer group?

How would you have felt, if your group were led by a member of staff rather than by a peer?

Describe if this experience has had an impact on your medical training?

Is there anything else you would like to add?

For Group Participants Doing Relaxation Exercises:

What was your experience of doing relaxation homework?

How did you find the time commitment of being in a relaxation group?
Appendix 14: Peer Randomised Controlled Trial Consent Form

CONSENT FORM
(for questionnaires)

THIS FORM WILL BE HELD FOR A PERIOD OF 6 YEARS

THE PROJECT TITLE:

Peer Interventions for Mental Health in Medical Students: A Randomised Controlled Trial

Researchers: Dr Fiona Moir, Senior Lecturer, Department of General Practice and Primary Healthcare; Dr Raina Elley, Senior Lecturer, Department of General Practice and Primary Healthcare; Dr Marcus Henning, Centre for Medical and Health Sciences Education, University of Auckland

I have read the Participant Information Sheet and have understood the nature of the research. I have had the opportunity to ask questions and have them answered to my satisfaction. I realise that permission has been sought from the Phase 1 Co-ordinator. I am aware that any publications resulting from this research will be provided via CECIL

- I agree to take part in this research, which involves 20 minutes of questionnaires at the start and end of the study (6 months later). Depending on which group I am in, I may attend an introductory meeting run by the peer leaders, optional weekly 20-30 minute relaxation sessions and optional 'peer leader socials' 2-3 times a year. I may receive regular e-mails from the peer leader. I may also choose to contact the peer leader if I have any issues I wish to discuss. If voted as peer leader and I accept, I will attend training for approximately 20 hours as part of the medical humanities option.

- I understand that my taking part in this study is voluntary and that material, which could identify me, will not be used in any reports related to this study.

- I am aware that I do not have to answer all of the questions and I may withdraw from participation up to the time of data analysis, i.e. the end of November 2011

- I am aware that I may withdraw data up to the time of data analysis, i.e. the end of November 2011

- I am aware that I have the right to withdraw from the intervention group or from the role of peer group leader, at any time.

- I understand that the data collected is confidential, and it will be kept for 6 years, after which time it will be destroyed.

- I am aware that there will be no negative impact on my study grades if I decide not to participate in the study.

- I understand that at the end of the completion of the research all data will be deleted and paper copies of any notes will be confidentially recycled.

Name

Phone Number Email Address

Signature Date

APPROVED BY THE UNIVERSITY OF AUCKLAND HUMAN PARTICIPANTS ETHICS COMMITTEE ON 25/2/11 FOR 3 YEARS REFERENCE NUMBER 2011/028
Appendix 15: Peer Randomised Controlled Trial Participant Information Sheet

Peer Interventions for Mental Health in Medical Students: A Randomised Controlled Trial

Researchers: Dr. Fiona Mac, Senior Lecturer, Dept General Practice & Primary Healthcare and PhD student Dr Raena Elley, Senior Lecturer, Department of General Practice and Primary Healthcare; Dr Marcus Hanning, Centre for Medical and Health Sciences Education, University of Auckland

Project Description and Invitation:
Medical students have been found to have high rates of depression and anxiety, in comparison to other people the same age, but often do not seek professional help. This study will be trialling an intervention to improve mental health using peers to provide relaxation training and support. Permission has been sought from the Phase 1 Coordinator who supports this research and believes it is of value and interest. This study will provide greater insight into peer-led interventions to improve mental health, and could benefit medical students here and internationally. As a participant you will likely benefit by raising your awareness around the areas of relaxation training, peer-support and peer-teaching. Results and publications from this research will be made available via CECIL.

Project Procedure:
If you consent to participate, you will be invited to attend the study meeting where you will be invited to vote for ‘peer-group leaders’ for the study. You will be invited to fill in a confidential questionnaire about depression, anxiety, quality of life, and academic motivation and self-concept, which will take about 20 minutes to complete.
The remaining participants will be allocated into 2 groups:
- Intervention Group: peer-taught relaxation and peer support led by Year 3 student leaders
- Control Group: access to CALM website (available to all class members)

Peer Group leader training: The elected group leaders will undergo a training programme with the researcher that includes listening skills, group facilitation, setting and maintaining boundaries, confidentiality and safety issues. They will be instructed to contact the researchers or student health counsellors with any concerns, and will also be given information about after-hours mental health services. They will also be taught how to run a relaxation exercise.
The peer leader training will take approximately 20 hours in place of medical humanities option.

Intervention Group: Students participating in the intervention group will be invited to attend an introductory meeting which will be run by the elected peer group leaders who will outline the services available to the intervention group participants. These will include:
- Optional attendance at a weekly relaxation session lasting for 20-30 minutes, which will be in a regular time-slot and venue. After attendance at one of these sessions, the participant may ask the peer leaders for a relaxation CD, so that they can do some relaxation practice at home. The relaxation class will be run by two of the peer leaders for each week of the study. After the relaxation class, the two peer leaders will be available to talk individually to any student who wishes to discuss any issues on a one to one basis.
- Optional attendance at any ‘peer leader socials’ which will be social occasions run by the peer leaders 2 or 3 times during the 6 month study.
- To contact one of the peer leaders if they have any issues they wish to discuss.
The peer support leader will be sent a group e-mail about once a month as a reminder that they are available should the need arise, to invite students to attend the ‘peer leader socials’ or to inform them of any new support services available.

Peer Leader Role: Peer leaders will be taught during training about their role in terms of ‘acting responsibly and referring appropriately’, but not ‘being responsible’ for other students. They will be asked to refer students who contact them to appropriate professional services. They will receive supervision, and will be asked to contact their supervisor with issues which arise in between supervision meetings. Peer leaders will be supplied with emergency contact numbers of agencies (including after hours agencies). They will be asked to be available to help other students at the appointed times (after relaxation sessions as above), and outside of this, they can arrange to see a student at a convenient time if they are able to do so.
They are not expected to be available to other students during weekends, holidays, or at night. As part of the intervention above, they will have provided students in the intervention group with after hours numbers of support services.

At the conclusion of the study after 6 months, all participants will be asked to complete the questionnaire again (20 minutes).

Right to Withdraw from Participation:
Participants have the right to withdraw from participation up to the time of data analysis, i.e. the end of November 2011. Participants have the right to withdraw from the intervention groups or from the role of peer group leader, at any time. Data may be withdrawn up to the time of data analysis, i.e. the end of November 2011.

Anonymity and Confidentiality:
The consent forms will be stored separately from the questionnaires. No identifiable information will be used during analysis or write-up. Information will only be used for the research and not made available to any medical school or other parties. The individual results of the questionnaires and responses are confidential. Your names will not appear in any reports or subsequent publications, and your responses will be confidential. There will be no negative impact on your study grades if you decide not to participate in the study.

Data storage:
Data will be stored for a period of 6 years. At the end of the completion of the research all data will be deleted and paper copies of questionnaires confidentially recycled.

Compensation
All study participants will receive a $20 mobile phone top-up card or petrol voucher to reimburse them for their time in attending the randomisation meeting, and for participating in the intervention or control groups. Those selected as peer-group leaders will receive a further $40 mobile phone top-up card to reimburse them for their time in attending the group leader training sessions.

We do not anticipate any physical or psychological risks involved in this study. However, the health and counselling service is available if you wish to seek independent assistance related to your wellbeing. Counsellor Kimberly Farmer is aware of the study and can provide assistance if required. In the unlikely event of a physical injury as a result of your participation in this study, you may be covered by ACC under the Injury Prevention, Rehabilitation, and Compensation Act 2001. ACC cover is not automatic, and your case will need to be assessed by ACC according to the provisions of the Injury Prevention, Rehabilitation, and Compensation Act 2001. If your claim is accepted by ACC, you still might not get any compensation. This depends on a number of factors, such as whether you are an earner or non-earner. ACC usually provides only partial reimbursement of costs and expenses, and there may be no lump sum compensation payable. There is no cover for mental injury unless it is a result of physical injury. If you have ACC cover, generally this will affect your right to sue the investigators. If you have any questions about ACC, contact your nearest ACC office or the investigator.

Funding
Dr Fiona Moir is the recipient of a University of Auckland Doctoral Scholarship

If you have questions associated with this study you may contact Dr Fiona Moir (09-3737599 ext. 84473 or email: f.moir@auckland.ac.nz)

The contact information for the head of department for the University of Auckland researchers is: Professor Bruce Arroll, Department of General Practice and Primary Healthcare, Auckland, New Zealand. Email: b.arroll@auckland.ac.nz or 09373-7599 ext. 86978.

For any queries regarding ethical concerns you may contact the Chair, The University of Auckland Human Participants Ethics Committee, The University of Auckland, Office of the Vice Chancellor, Private Bag 92019, Auckland 1142. Telephone 09 373-7599 extn. 83711.

APPROVED BY THE UNIVERSITY OF AUCKLAND HUMAN PARTICIPANTS ETHICS COMMITTEE ON 25/2/2011 for 1 year, Reference Number 2011/028
Appendix 16: Peer Randomised Controlled Trial Peer Leader

Voting Form

Peer Interventions for Mental Health in Medical Students:
Dr Fiona Moir

PEER LEADER VOTING

Please vote for 3 people in Year 3, who you think would make good Peer Leaders

We are looking for ‘the trusted people’ i.e. the people that you (or other students in Years 2 and 3) might choose to talk to if you were in difficulty, or had an emotional or practical problem.

The elected group leaders will undergo a training programme which will enable them to run relaxation groups and ‘peer leader socials’ and to provide one-on-one support and referral if required. They will be supported by staff throughout this process.

Please vote for yourself if you would like to be considered for the role of Peer Leader

<table>
<thead>
<tr>
<th>Points awarded</th>
<th>Student’s Name: (Please write clearly, and put the student’s ‘official’ name, rather than a nick-name, so that they can be contacted)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st Choice</td>
<td>3 points</td>
</tr>
<tr>
<td>2nd Choice</td>
<td>2 points</td>
</tr>
<tr>
<td>3rd Choice</td>
<td>1 point</td>
</tr>
</tbody>
</table>
Appendix 17: Peer Randomised Controlled Trial Peer Leader

Application Form

Peer Interventions for Mental Health in Medical Students: Dr Fiona Moir

PEER LEADER APPLICATION

Please fill in this form if you would like to be considered for the role of Peer Leader

Name:

Gender:

Ethnicity:

Please write no more than a paragraph or two in total and include:

- why you would like to be a peer leader
- why you think you would make a good peer leader
Appendix 18: Peer Randomised Controlled Trial Final

Questionnaire

ID Number: 
Year 3: 14/10/11

QUESTIONNAIRES FOR YEARS 2 & 3 MEDICAL STUDENT RCT (FIONA MOIR 2011)

Gender:  Please circle  Male / Female

Age (at 29/4/2011):
(Please do not enter the age you are now – we need the age you were when you filled in the first questionnaire back in April at the ‘baseline’ meeting)

(PHQ-9 Questionnaire):

<table>
<thead>
<tr>
<th>Over the last 2 weeks, how often have you been bothered by any of the following:</th>
<th>Not at all</th>
<th>Several days</th>
<th>More than half the days</th>
<th>Nearly every day</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Little interest or pleasure in doing things?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 Feeling down, depressed or hopeless?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 Trouble falling or staying asleep, or sleeping too much?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4 Feeling tired or having little energy?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5 Poor appetite or overeating?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6 Feeling bad about yourself or that you are a failure or have let yourself or your family down?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7 Trouble concentrating on things such as reading the newspaper or watching television?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8 Moving or speaking so slowly that other people could have noticed? Or the opposite—being so fidgety or restless that you have been moving around a lot more than usual?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9 Thoughts that you would be better off dead or of hurting yourself in some way?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10 If you checked off any problems – how difficult have these problems made it for you to do your work or take care of things at home?</td>
<td>Not difficult at all</td>
<td>Somewhat difficult</td>
<td>Very difficult</td>
<td>Extremely difficult</td>
</tr>
</tbody>
</table>
**GAD-7 Questionnaire):**

<table>
<thead>
<tr>
<th>Over the last 2 weeks, how often have you been bothered by any of the following:</th>
<th>Not at all</th>
<th>Several days</th>
<th>More than half the days</th>
<th>Nearly every day</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Feeling nervous, anxious or on edge?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 Not being able to stop or control worrying?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 Worrying too much about different things?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4 Trouble relaxing?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5 Being so restless that it is hard to sit still?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6 Becoming easily annoyed or irritable?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7 Feeling afraid as if something awful might happen?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*(Perceived Competence for Learning)*

Please respond to each of the following items in terms of how true it is for you with respect to your learning in this course (i.e. at medical school). Use the scale:

1 2 3 4 5 6 7
not at all somewhat very true true

1. I feel confident in my ability to learn this material.
   1 2 3 4 5 6 7

2. I am capable of learning the material in this course
   1 2 3 4 5 6 7

3. I am able to achieve my goals in this course.
   1 2 3 4 5 6 7

4. I feel able to meet the challenge of performing well in this course.
   1 2 3 4 5 6 7
LASA Quality of Life

Directions: Please circle the number (0-10) best reflecting your response to the following that describes your feelings during the past week, including today.

How would you describe:

1. Your overall Quality of Life?
   0 1 2 3 4 5 6 7 8 9 10
   As bad as it can be
   As good as it can be

2. Your overall mental (intellectual) well-being?
   0 1 2 3 4 5 6 7 8 9 10

3. Your overall physical well-being?
   0 1 2 3 4 5 6 7 8 9 10

4. Your overall emotional well-being?
   0 1 2 3 4 5 6 7 8 9 10

5. Your level of social activity?
   0 1 2 3 4 5 6 7 8 9 10

6. Your overall spiritual well-being?
   0 1 2 3 4 5 6 7 8 9 10

7. The frequency of your pain?
   0 1 2 3 4 5 6 7 8 9 10

8. The severity of your pain, on the average?
   0 1 2 3 4 5 6 7 8 9 10

9. Your level of fatigue, on the average?
   0 1 2 3 4 5 6 7 8 9 10

10. Your level of support from friends and family?
    0 1 2 3 4 5 6 7 8 9 10

11. Your financial concerns?
    0 1 2 3 4 5 6 7 8 9 10

12. Your legal concerns (will, advanced directives, etc.)?
    0 1 2 3 4 5 6 7 8 9 10
Motivated Strategies for Learning Questionnaire

*Please rate the following items based on your behaviour in reference to this semester’s medical school programme. Your rating should be on a 7-point scale where 1 = Disagree to 7 = Agree*

<table>
<thead>
<tr>
<th>Disagree</th>
<th>Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 2 3 4 5 6 7</td>
<td>1 2 3 4 5 6 7</td>
</tr>
</tbody>
</table>

1. I prefer class work that is challenging so I can learn new things.

2. Compared with other students in this class I expect to do well

3. I am so nervous during a test that I cannot remember facts I have learned

4. It is important for me to learn what is being taught in this class

5. I like what I am learning in this class

6. I’m certain I can understand the ideas taught in this course

7. I think I will be able to use what I learn in this class in other classes

8. I expect to do very well in this class

9. Compared with others in this class, I think I’m a good student

10. I often choose paper topics I will learn something from even if they require more work

11. I am sure I can do an excellent job on the problems and tasks assigned for this class

12. I have an uneasy, upset feeling when I take a test

13. I think I will receive a good grade in this class

14. Even when I do poorly on a test I try to learn from my mistakes

15. I think that what I am learning in this class is useful for me to know
<table>
<thead>
<tr>
<th>Disagree</th>
<th>Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>16. My study skills are excellent compared with others in this class</td>
<td></td>
</tr>
<tr>
<td>17. I think that what we are learning in this class is interesting</td>
<td></td>
</tr>
<tr>
<td>18. Compared with other students in this class I think I know a great deal about the subject</td>
<td></td>
</tr>
<tr>
<td>19. I know that I will be able to learn the material for this class</td>
<td></td>
</tr>
<tr>
<td>20. I worry a great deal about tests</td>
<td></td>
</tr>
<tr>
<td>21. Understanding this subject is important to me</td>
<td></td>
</tr>
<tr>
<td>22. When I take a test I think about how poorly I am doing</td>
<td></td>
</tr>
<tr>
<td>23. When I study for a test, I try to put together the information from class and from the book</td>
<td></td>
</tr>
<tr>
<td>24. When I do homework, I try to remember what the teacher said in class so I can answer the questions correctly</td>
<td></td>
</tr>
<tr>
<td>25. I ask myself questions to make sure I know the material I have been studying</td>
<td></td>
</tr>
<tr>
<td>26. It is hard for me to decide what the main ideas are in what I read</td>
<td></td>
</tr>
<tr>
<td>27. When work is hard I either give up or study only the easy parts</td>
<td></td>
</tr>
<tr>
<td>28. When I study I put important ideas into my own words</td>
<td></td>
</tr>
<tr>
<td>29. I always try to understand what the teacher is saying even if it doesn’t make sense</td>
<td></td>
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<tr>
<td>30. When I study for a test I try to remember as many facts as I can</td>
<td></td>
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<tr>
<td>Disagree</td>
<td>Agree</td>
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<tr>
<td>1 2 3 4 5 6 7</td>
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</table>

31. When studying, I copy my notes over to help me remember material
   1 2 3 4 5 6 7

32. I work on practice exercises and answer end of chapter questions even when I don’t have to
   1 2 3 4 5 6 7

33. Even when study materials are dull and uninteresting, I keep working until I finish
   1 2 3 4 5 6 7

34. When I study for a test I practice saying the important facts over and over to myself
   1 2 3 4 5 6 7

35. Before I begin studying I think about the things I will need to do to learn
   1 2 3 4 5 6 7

36. I use what I have learned from old homework assignments and the textbook to do new assignments
   1 2 3 4 5 6 7

37. I often find that I have been reading for class but don’t know what it is all about.
   1 2 3 4 5 6 7

38. I find that when the teacher is talking I think of other things and don’t really listen to what is being said
   1 2 3 4 5 6 7

39. When I am studying a topic, I try to make everything fit together
   1 2 3 4 5 6 7

40. When I’m reading I stop once in a while and go over what I have read
   1 2 3 4 5 6 7

41. When I read materials for this class, I say the words over and over to myself to help me remember
   1 2 3 4 5 6 7

42. I outline the chapters in my book to help me study
   1 2 3 4 5 6 7

43. I work hard to get a good grade even when I don’t like a class
   1 2 3 4 5 6 7

44. When reading I try to connect the things I am reading about with what I already know.
   1 2 3 4 5 6 7
Please circle a number indicating how much you agree or disagree with each statement.

<table>
<thead>
<tr>
<th>Agree</th>
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<td>6</td>
<td>7</td>
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</tbody>
</table>

1. When I make plans I follow through with them.
   1 2 3 4 5 6 7

2. I usually manage one way or another.
   1 2 3 4 5 6 7

3. I feel proud that I have accomplished things in my life.
   1 2 3 4 5 6 7

4. I usually take things in my stride.
   1 2 3 4 5 6 7

5. I am friends with myself.
   1 2 3 4 5 6 7

6. I feel that I can handle many things at a time.
   1 2 3 4 5 6 7

7. I am determined.
   1 2 3 4 5 6 7

8. I have self-discipline.
   1 2 3 4 5 6 7

9. I keep interested in things.
   1 2 3 4 5 6 7

10. I can usually find something to laugh about.
    1 2 3 4 5 6 7

11. My belief in myself gets me through hard times.
    1 2 3 4 5 6 7

12. I can usually look at a situation in a number of ways.
    1 2 3 4 5 6 7

13. My life has meaning.
    1 2 3 4 5 6 7

14. When I am in a difficult situation, I can usually find my way out of it.
    1 2 3 4 5 6 7

15. I have enough energy to do what I have to do.
    1 2 3 4 5 6 7
PLEASE CAN EVERYBODY FILL IN THIS SECTION

(I.E. BOTH THE CONTROL GROUP AND THE INTERVENTION GROUP):

Please give your best estimate for the following questions.

Since the start of this study (27th April 2011): (please circle YES or NO)

- Did you attend the peer leader bowling social session? YES / NO
- Did you attend the peer leader cup cake social session? YES / NO
- During the trial period did you listen to one of the trial mindfulness CD set at least once?
  YES / NO

For the questions below – please estimate a number (just write one number in the box, not a range of numbers):

- How many of the weekly mindfulness sessions run by the peer leaders did you attend?

Any Comments?

For the questions below – please estimate a number (just write one number, not a range of numbers):

- How many times did you practice mindfulness in the 6 months before the onset of the study? (i.e. November 2010 to 27th April 2011)

- How many times did you practice mindfulness in the 6 months since the onset of the study? (i.e. 27th April 2011 to 14th October 2011)

- Any other comments about the trial?
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