The impact of medical students' values on their clinical decision-making

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A thesis submitted in fulfilment of the requirements for the degree of Doctor of Philosophy in Health Sciences

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ABSTRACT

Introduction Clinical decision-making involves choosing which treatments are best for patients. Often there is no consensus among practitioners on the best alternatives, and values of individual practitioners may guide their decisions. This thesis investigates how the values of medical students may impact on their clinical decisions.

Methods A systematic literature review was undertaken to identify personal and professional values of healthcare practitioners. The values were arranged within Schwartz's values model and a framework for healthcare practitioners' values, which formed the basis for a new instrument, the Healthcare Practitioner Values Scale (HPVS), was derived. Content and construct validity of the HPVS was explored using the Schwartz Values Survey (SVS) as a reference for the HPVS' content and structure in a sample of healthcare students and professionals. The impact of medical students' values on their decision-making was investigated using the HPVS to measure their values, and content analysis to measure their decision-making in four clinical scenarios.

Results The systematic review identified eleven healthcare practitioners' values (authority, capability, pleasure, intellectual-stimulation, critical thinking, equality, altruism, morality, professionalism, safety and spirituality) and defined a structure of relations among them. Schwartz's structure of value relations was replicated in the sample of students and professionals studied. HPVS and SVS value correlations ranged from -0.39 to 0.64. The correlation between the structure of the HPVS and SVS was 0.43 (CI - 0.29 - 0.57). Spirituality and critical thinking were the prominent values that influenced students' decision-making. Students who prioritised spirituality were more likely to consider patient-

centred factors in their decisions, and less likely to consider clinical factors than other students. Students who prioritised critical thinking were less likely to consider patient-centred factors in their decisions than other students.

Conclusion This thesis developed and demonstrated evidence of validity for the HPVS, which measures key values across healthcare professions, and embeds a theory on relations among them. It can be a valuable tool to identify value-related issues in decision-making in clinical practice. This thesis concludes that students' values may influence their clinical decision-making. Helping students and professionals become aware of their values may improve their decision-making and quality of patient care.

DEDICATION

In the loving memory of my late father Adam. You always saw this greatness in me and encouraged me. This is to make you proud of me. To my mother Bessie for always being a great mother to all of us and supporting our dreams.

To my lovely daughter, Saacha Nozithelo Moyo, who has only known daddy as the super busy guy, I dedicate this work to you. May it inspire you to work just as hard when that time comes.Thank you for understanding daddy had to be a busy man all the time.

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ABBREVIATIONS

ABIM - American Board of Internal Medicine

AACN - American Association of Colleges of Nursing

ANA - American Nurses Association

AOS -Academic Orthopedic Society

DVS - Dental Values Scale

HPVS - Health Practitioner Values Scale

INU - Israeli Nursing Union Ethics Committee

MeSH - Medical Subject Heading

NCHK - Nursing Council of Hong Kong

NPVS - Nurses Professional Values Scale

PRISMA - Preferred Reporting Items for Systematic Reviews and Meta-Analyses

PVIPS - Physician Values in Practice Scale

SVS - Schwartz Values Survey

GLOSSARY OF TERMS

This section provides an outline of the key concepts used in this thesis. These are the definitions used within the context of this study.

Students - This refers to healthcare students in general, and medical students in Chapter 4.

Professionals - This refers to a practicing healthcare person.

Practitioners - This may refer to both healthcare students and professionals broadly or just healthcare professionals depending on the context of the text.

Research team / team - This refers to the PhD candidate and his three supervisors and one advisor. Some research methodologies such as the Delphi processes used in the systematic review and instrument development required consensus gathering to guarantee validity and reliability of some data analysis steps. The candidate's supervisors and advisors assisted as parties to the consensus gathering. The candidate prepared and reviewed all material for consensus gathering.

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Please indicate the chapter/section/pages of this thesis that are extracted from a co-authored work and give the title and publication details or details of submission of the co-authored work. Chapter 2 Paper: Moyo, M., Goodyear-Smith, F. A., Weller, J., Robb, G., & Shulruf, B. (2016). Healthcare Practitioners' Personal and Professional Values. Advances in Health Sciences Education, 21(2), 257-286.	
Nature of contribution by PhD candidate	Study design, literature search, analysis and writing
Extent of contribution by PhD candidate (%)	75%

CO-AUTHORS

Name	Nature of Contribution
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Boaz Shulruf	Study design, review of methods, writing
Jennifer Weller	Study design, review of methods, writing
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Certification by Co-Authors

The undersigned hereby certify that:

- the above statement correctly reflects the nature and extent of the PhD candidate's contribution to this work, and the nature of the contribution of each of the co-authors; and
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Extent of contribution by PhD candidate (%)	80%

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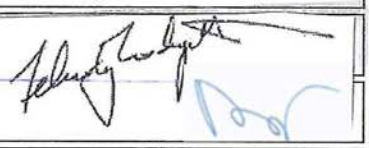
Name	Signature	Date
Felicity Goodyear-Smith		7 July 2016
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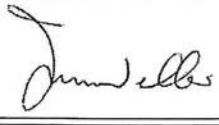
Jennifer Weller		7th July 2016

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Extent of contribution by PhD candidate (%)	80%

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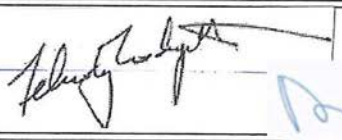
Felicity Goodyear-Smith		7 July 2016
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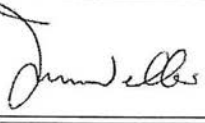
Jennifer Weller		7th July 2016

Chapter 1. Introduction

1.1 Overview of thesis

Modern clinical practice is generally guided by scientific evidence or consensus among practitioners on which decisions are best for patient care (Guyatt et al., 1992). However, situations are common in everyday practice in which there is uncertainty on the clinical evidence available, or lack of consensus on which decisions would be best for the patient (Forman & Ladd, 1989; Logan & Scott, 1996). These are situations in which there are no universal clear-cut right or wrong decisions, but only choices to be made (Bruhn & Henderson, 1991; Gray & Gibbons, 2007). Some literature suggests that decisions in such situations are largely influenced by the values and personal experiences of the practitioners (Pope & Bajt, 1988; Smith, McGuire, Abbott, & Blau, 1991). However, present research on values and decision-making in clinical practice has generally focused on identifying patient values in particular clinical circumstances (Karel, 2000; Levine, Gafni, Markham, & MacFarlane, 1992; O'Connor et al., 1999; Protheroe, Fahey, Montgomery, Peters, & Smeeth, 2000). Little research has investigated the influence of identifiable practitioners' values on clinical decision-making in everyday practice contexts. This thesis addressed this gap, by principally investigating the role of medical students' values on their clinical decision-making.

Some studies have looked at the role of values in ethical decision-making in medical students (Helkama et al., 2003; McCabe, Dukerich, & Dutton, 1992), and the role of values in problem-solving in nursing students (Altun, 2003). However, ethical decision-making is

concerned with determining whether given actions are right or wrong, just or unjust, assuming that there are objective principles of determining these differences (Hosmer, 1994). In contrast, decision-making in everyday practice, on which this thesis focuses, often requires evaluation of competing priorities and making sound decisions in circumstances where simply knowing right from wrong may not be sufficient (Lesser et al., 2010). For example, considering options for managing prostate enlargement in a male patient may involve evaluating subjective evidence on the benefits and harms of different options, and considering the patient's preferences for different outcomes, rather than simply judging what could be the ethically right or wrong course of action (Schwartz, Deschere, & Jinping, 2005). On the other hand, although problem-solving and decision-making are related, they are quite different. Problem-solving is a method of identifying and resolving a gap between a given situation and a desired goal, whilst decision-making is the process in which a solution is chosen among possible alternatives to reach the desired goals (Huitt, 1992). This thesis is focused on decision-making involving the selection of choices amongst alternative solutions to arrive at treatment plans for patients.

There is wide acknowledgement that practitioners' values significantly influence clinical decisions in everyday clinical practice (Levy, 1976; Pope & Bajt, 1988; Savulescu, 2011; Smith et al., 1991). However, the comprehensive range of the values that guide practitioners' decisions in everyday clinical practice have not been made explicit to date. Consequently, no comprehensive framework is available to measure this range of values. Practitioners' values have mostly been studied using frameworks based on professional ethics codes (Leners et al., 2006; Y. Lin et al., 2010; Weis & Schank, 2000) or personal values frameworks (Rokeach, 1973; Schwartz, 1992). The ethics code-based frameworks only represent a subset of practitioners' values that guide decisions on patient care (Pope & Bajt, 1988). On the other

hand personal values frameworks cover a wider range of values relevant to decision-making in general, but are not defined within the healthcare practice contexts to provide focused insights on decisions on patient care. Therefore, primary work on this thesis included the development of a comprehensive framework which integrates a wide range of practitioners' personal and professional values relevant to decision-making in everyday healthcare practice. Similar integrated frameworks have been suggested for studying work values (Dose, 1997; Roe & Ester, 1999). The framework established in this thesis was used to develop a theoretically-based values instrument that is relevant to the context of making decisions on patient care in daily practice. The instrument was used to investigate the impact of medical students' values on their clinical decision-making.

Decision-making in clinical practice is complex and hence it often occurs within defined models of clinical care that guide how practitioners approach their decisions (Bensing, 2000; Little, 2002; Miles & Loughlin, 2011). Models of clinical care range from humanistic care (Bensing, 2000; Panda, 2006), which emphasises caring and healing relationships between practitioners and patients, to evidence-based care (Guyatt et al., 1992), which emphasises use of data from clinical research to guide decision-making. Humanistic care models focus on addressing individual patients' needs and circumstances, and caring for patients as persons first, and attending to their social and emotional well-being instead of focusing on just their biological disease (Hartzband & Groopman, 2009; Little, 2002; Miles, 2012; Miles & Loughlin, 2011). The biopsychosocial model, patient-centred care, person-centred care and value-based practice models fall into the humanistic care category (Engel, 1977; R. G. Evans, 2003; Fulford, Caroll, & Peile, 2011; Miles & Mezzich, 2011). In contrast, evidence-based care models focus on the science of diseases, and integration of the best evidence from scientific research into treatment decisions (Bensing, 2000; Haynes, Sackett, Gray, Cook, &

Guyatt, 1997). Evidence-based care embeds advances in science into clinical practice and strengthens clinical practice as a science (Panda, 2006).

Particular practitioner skills and personal attributes are emphasised within given models of clinical care. For example compassionate care and attentive listening are emphasised in humanistic care (Bensing, 2000; Miles & Loughlin, 2011), whilst efficient literature search and critical evaluation of evidence are emphasised in evidence-based care (Guyatt, Meade, Jaeschke, Cook, & Haynes, 2000). Practitioners may show preferences for particular models of care in their decision-making (Little, 2002). In addition to identifying the impact of medical students' values on their clinical decision-making, this thesis further describes links between medical students' decision-making approaches and particular models of clinical care.

Overall, this thesis aims to identify the influence of medical students' values on individual decision-making in everyday practice contexts in healthcare. These are clinical contexts in which decisions are frequently evaluations of the best course of action to take on patient care, and not principally about ethical or legal concern, where right or wrong actions are determinable. The specific aims of the thesis are:

i) To identify personal and professional values of healthcare practitioners that are relevant to clinical decision-making in everyday clinical contexts, where decisions are not about legally or ethically right or wrong actions.

ii) To describe the development and validation of an instrument for the assessment of healthcare practitioners' personal and professional values.

iii) To investigate the influence of medical students' values on their clinical decision-making.

1.2 Research questions

In line with the above aims, this thesis addresses the following research questions:

Q1) Across healthcare professions, what personal and professional values are relevant to decision-making in everyday clinical contexts where decisions are not about right or wrong judgements (i.e. contexts where decisions can be different for different practitioners but are all legal and ethical)?

Q2) Is there evidence of validity for a short multiple-item instrument developed to measure the identified personal and professional values of healthcare practitioners?

Q3) How do medical students' values influence their clinical decision-making?

1.3 Delimitations

This thesis focuses on decision-making by individual practitioners in their interaction with patients in everyday practice contexts. Consequently, this thesis does not consider ethical or legal decision-making where decisions are about right or wrong. Similarly, the values studied in this thesis are not judged as right or wrong, good or bad, ethical or not ethical, as this

would be an external judgement of what the values mean, and not the individuals' consideration of what values are important in guiding their decisions.

1.4 Thesis outline

This thesis is presented as a series of studies (Figure 1.1 below) which address the specific research questions stated above.

Chapter 2. This chapter describes a systematic review to identify practitioners' values that are relevant to decision-making in everyday practice contexts in healthcare. It describes Schwartz's values model as a framework for integrating the identified values, and describes the derivation of a framework for healthcare practitioners' values from Schwartz's values model.

Chapter 3. This chapter describes the development and validation of an instrument to measure practitioners' personal and professional values, the Healthcare Practitioner Values Scale (HPVS).

Chapter 4. This chapter describes empirical work exploring the relationship between values and decision-making in medical students. Values are measured using the HPVS and decision-making is measured using content analysis.

Chapter 5. This chapter discusses findings in this thesis within broader contexts on decision-making in healthcare. It discusses key values which influence clinical decision-making within the context of wider literature on relevant concepts and models of clinical care. The chapter also summarises findings from this thesis, and discusses implications of the findings, limitations of this thesis, and possible future research from work on this thesis.

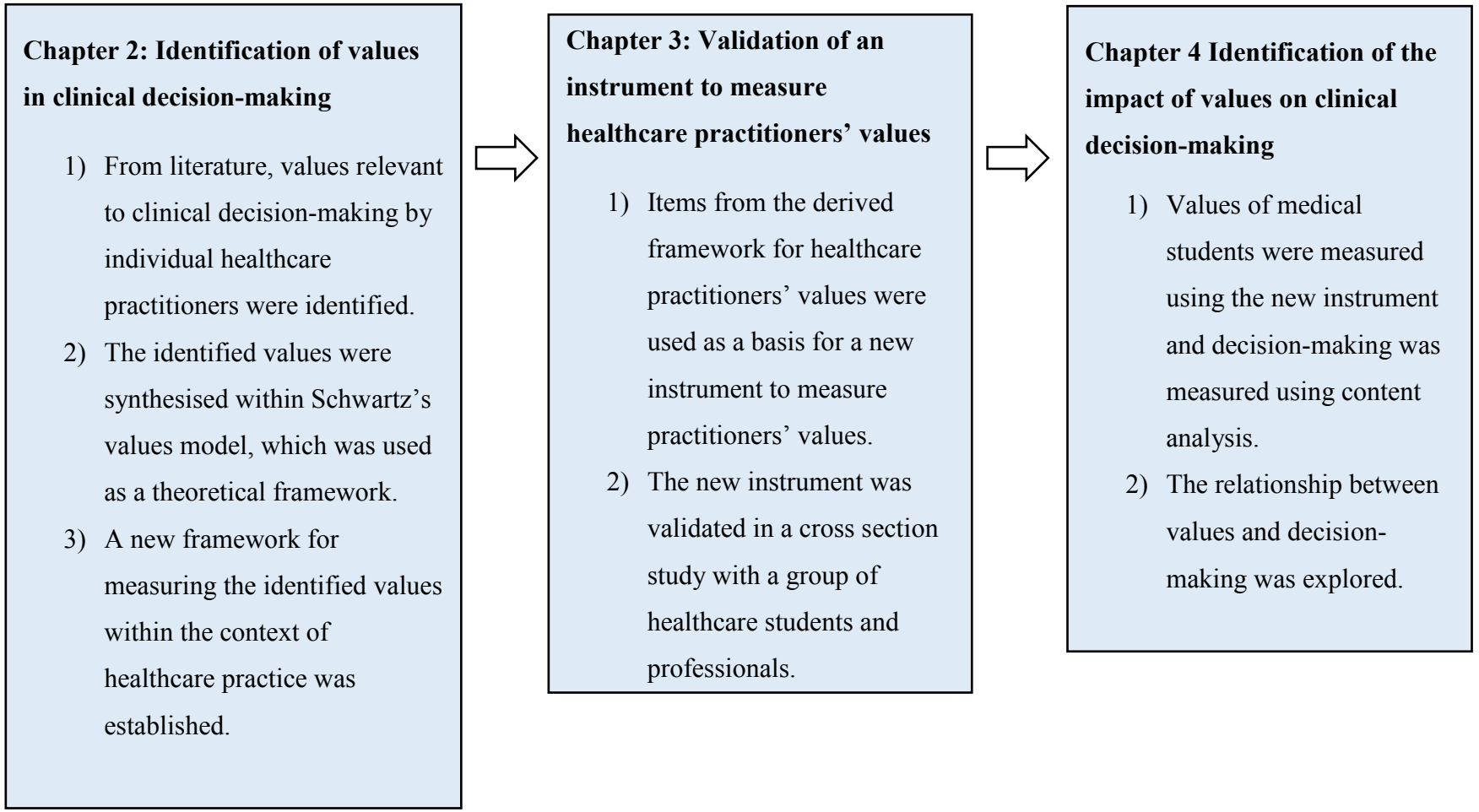


Figure 1.1 Organisation of studies in this thesis

1.5 Chapter summary

This chapter has outlined the rationale for this thesis and the research questions it seeks to answer. The overarching aim is to identify the impact of values on clinical decision-making by medical students. However, there is a need to identify the comprehensive set of values that may influence decision-making in everyday clinical practice, and a need to establish a theoretically-based values instrument from this set of values, as the first steps to address this aim. The next two chapters focus on these preliminary tasks.

Chapter 2. Study one: Systematic review to identify personal and professional values of healthcare practitioners

2.1 Chapter outline

This chapter addresses the first specific aim of this thesis – identifying values that are relevant to decision-making in everyday practice contexts across healthcare professions. It reports a systematic literature review study to identify personal and professional values of healthcare practitioners (Moyo, Goodyear-Smith, Weller, Robb, & Shulruf, 2016).

2.2 Introduction

Although it is widely acknowledged that values of healthcare practitioners can influence their clinical decisions significantly (Gross & Robinson, 1987; Pope & Bajt, 1988; Smith et al., 1991), the comprehensive set of practitioners' values relevant to their decision-making has not been made explicit. The present study aimed to identify the comprehensive set of practitioners' values that may influence their clinical decision-making in everyday practice contexts.

2.2.1 The value concept

Values are basic convictions of what individuals or social groups consider right, good or desirable (Kluckhohn & Strodtbeck, 1951; Rokeach, 1973). They are stable and enduring beliefs that generally require prolonged social or educational processes to change (Bergman,

1998). They are not specific to given objects or situations (Rokeach, 1968). For example values such as obedience and honesty are relevant in different situations including home, school or work, and in interactions with parents, friends or strangers (Schwartz, 2012). This stability and general relevance of values to different situations distinguishes them from attitudes and opinions (Bergman, 1998; Schwartz, 2012), which also describe preferences towards some behaviours (Bergman, 1998). In contrast to values, attitudes and opinions usually refer to evaluation of specific objects, actions or situations with some degree of favour or disfavour (Eagly & Chaiken, 1993; Oskamp, 2005). Furthermore, values are organised in relative importance to one another, whilst attitudes and opinions are not (Schwartz, 1992).

In daily life, values influence individuals' behaviours, and guide their evaluation of people, choices and actions (Rokeach, 1973; Schwartz, 1992). Different individuals place varying priorities on given values (Rokeach, 1973). However, not all values that are important to an individual are considered at the same time in a given context (Rokeach, 1968; Schwartz, 2012). Specific values are brought to the fore when they are relevant to the context (Rokeach, 1973; Schwartz, 2012). For example, a person who values independence may activate this value to guide their actions when their independence is threatened (Schwartz, 2012). Finally, values operate at individual (e.g. personal) and collective (e.g. professional and cultural) levels of identity (Hofstede, 1998; Meglino & Ravlin, 1998; Schwartz, 1999). Values overlap across these levels; some values are widely shared by a collective, whilst some values are acceptable according to the preferences of individuals (Dose, 1997).

2.2.2 Personal and professional values of healthcare practitioners

Both the personal and professional values of healthcare practitioners may influence their decisions on patient care (Gross & Robinson, 1987; Smith et al., 1991). Personal values guide people's behaviour and choices in their lives as individuals (Rokeach, 1973; Schwartz, 1992), whilst professional values guide their behaviour as members of occupational groups (Eddy, Elfrink, Weis, & Schank, 1994). Professional values are deliberately selected by the occupation as those values that shape the group's identity, principles and beliefs (Frankel, 1989). These values enjoy high consensus on their importance within the group, and are generally defined within their code of ethics (Frankel, 1989; Hussey, 1996).

Personal values are formed from an early stage in life through learning from family, immediate communities, and education institutions in a process called socialisation, a life-long process of acquisition and dissemination of skills, behaviours, values and norms important for a person to function as member of a given society (Goslin & Aldous, 1969). Professional values are developed later in life through socialisation within specific professional groups (Cohen, 1981). In professional socialisation, entrants to a new profession bring their earlier personal values, and learn and internalise values of the new profession via formal training and observing role models in the profession (Kenny, Mann, & MacLeod, 2003; Toit, 1995). Some of the learners' personal values may already be aligned with the values of the profession (Rabow, Remen, Parmelee, & Inui, 2010), whilst some are modified to align with those of the new profession to enable them to assume new professional roles and identities (Cohen, 1981; Levy, 1976). Although the values prioritised by different healthcare professions may differ, the process of socialisation is thought to be largely similar across the professions (Clark, 1997).

There is a strong relationship between personal and professional values. Once an individual assumes a professional role, professional values substantially guide their conduct in the occupational environment (Cohen, 1981; Toit, 1995). However, some of the individual's personal values remain important to them in their daily life and continue to influence their professional practice (Cohen, 1981; Levy, 1976; Toit, 1995). Professional values may not always equate with individuals' personal values in clinical situations, leading to personal-professional value conflicts (Levy, 1976; Rabow et al., 2010). The specific personal or professional values that guide a practitioner's clinical decision-making vary with clinical contexts, and sometimes the practitioner is unable to clearly distinguish between their personal and professional values (Pipes, Holstein, & Aguirre, 2005). Nevertheless, professionalism requires practitioners to reflect on their values or value conflicts at all times to negotiate decisions that are in the best interests of their patients (Levy, 1976; Rabow et al., 2010).

Information regarding practitioners' values is useful to different stakeholders including students, educators, managers, employers and policy makers (Martin, Yarbrough, & Alfred, 2003; Pendleton & King, 2002). Understanding values helps educators develop practitioners who can reflect on their values and those of their patients to promote patient-centred care (Epstein, 1999; Martin et al., 2003). However, effective education on values requires valid instruments to assess both the learning by students, and the efficacy of the teaching (Arnold, 2002). Values assessment helps to improve the decision-making skills of the learner, the teaching curricula on values, and the level of professionalism in clinical practice (Lynch, Surdyk, & Eiser, 2004). Furthermore, because clinical decision-making is influenced by both personal and professional values (Gross & Robinson, 1987; Smith et al., 1991), there is a need to assess and understand both these value types in healthcare practitioners.

While a few studies have assessed both personal and professional values using separate instruments (Langille, Catano, Boran, & Cunningham, 2010; Rassin, 2008; Thurston, Flood, Shupe, & Gerald, 1989), most have focused on only one or the other (Martin et al., 2003; McCabe et al., 1992; Rowley, Baldwin Jr, Bay, & Karpman, 2000). A comprehensive assessment framework for personal and professional values which influence decisions on patient care can help improve practitioners' decision-making skills (Epstein, 1999; Martin et al., 2003).

Furthermore, because modern healthcare is delivered by practitioners from a range of professions, it is important to understand practitioners' values within the context of interprofessional practice (Clark, 1997). The healthcare professions share common goals focused on improving the health of patients (Parsell, Spalding, & Bligh, 1998; Seedhouse, 2002), and the principles promoted in their codes of ethics are largely similar (Gillon & Lloyd, 1994). Principles such as putting the patients' interests above self-interests, avoiding harm to patients, and equitable access to healthcare apply to all healthcare professions (Beauchamp, 2007). As such, a common values framework that fosters a shared understanding of professionalism across the professions is essential to promote interprofessional practice (McNair, 2005). Such a common framework can assist educators in developing shared strategies for teaching and assessing values across professional groups (McNair, 2005), it can also help different professional groups understand each other's value priorities to facilitate improved teamwork, interprofessional decision-making and quality of patient care (Glen, 1999; McNair, 2005).

2.2.3 Schwartz's values model

This study uses Schwartz's values model as a theoretical framework for integrating healthcare practitioners' personal and professional values (Schwartz, 1992, 1994). The model describes ten broad values, often referred to as value types, which are defined as motivational goals (Table 2.1 below): power, achievement, hedonism, stimulation, self-direction, universalism, benevolence, tradition, conformity, and security. These broad values comprehensively cover all values important in guiding decision-making in all cultures (Braithwaite & Law, 1985).

Table 2.1 Schwartz values and their motivational goals

Schwartz value type	Motivational goal
Power	Social status and prestige, control or dominance over people and resources
Achievement	Personal success through demonstrating competence according to social standards
Hedonism	Pleasure or sensuous gratification for oneself
Stimulation	Excitement, novelty, and challenge in life
Self-direction	Independent thought and action - choosing, creating, exploring
Universalism	Understanding, appreciation, tolerance, and protection for the welfare of all people and for nature
Benevolence	Preservation and enhancement of the welfare of people with whom one is in frequent personal contact
Tradition	Respect for, commitment to, and acceptance of the customs and ideas that traditional culture or religion provides
Conformity	Restraint of actions, inclinations, and impulses likely to upset or harm others and violate social expectations or norms
Security	Safety, harmony, and stability of society, of relationships, and of self
Spirituality	Meaning, coherence and inner harmony through transcending everyday reality

Source (Schwartz, 1992)

Schwartz's model also defines a structure of value relations, which proposes possible compatibilities and conflicts among values - Figure 2.1 (Rohan, 2000). Evidence for the discriminant validity, predictive validity and reliability of the Schwartz values and structure of value relations has been collected across different cultures (Schwartz, 1992, 1994). In this study, Schwartz's generic values framework (Schwartz, 1992) was extended to healthcare professions as a group, to provide a theoretical base for assessment of practitioners' values in healthcare education and practice.

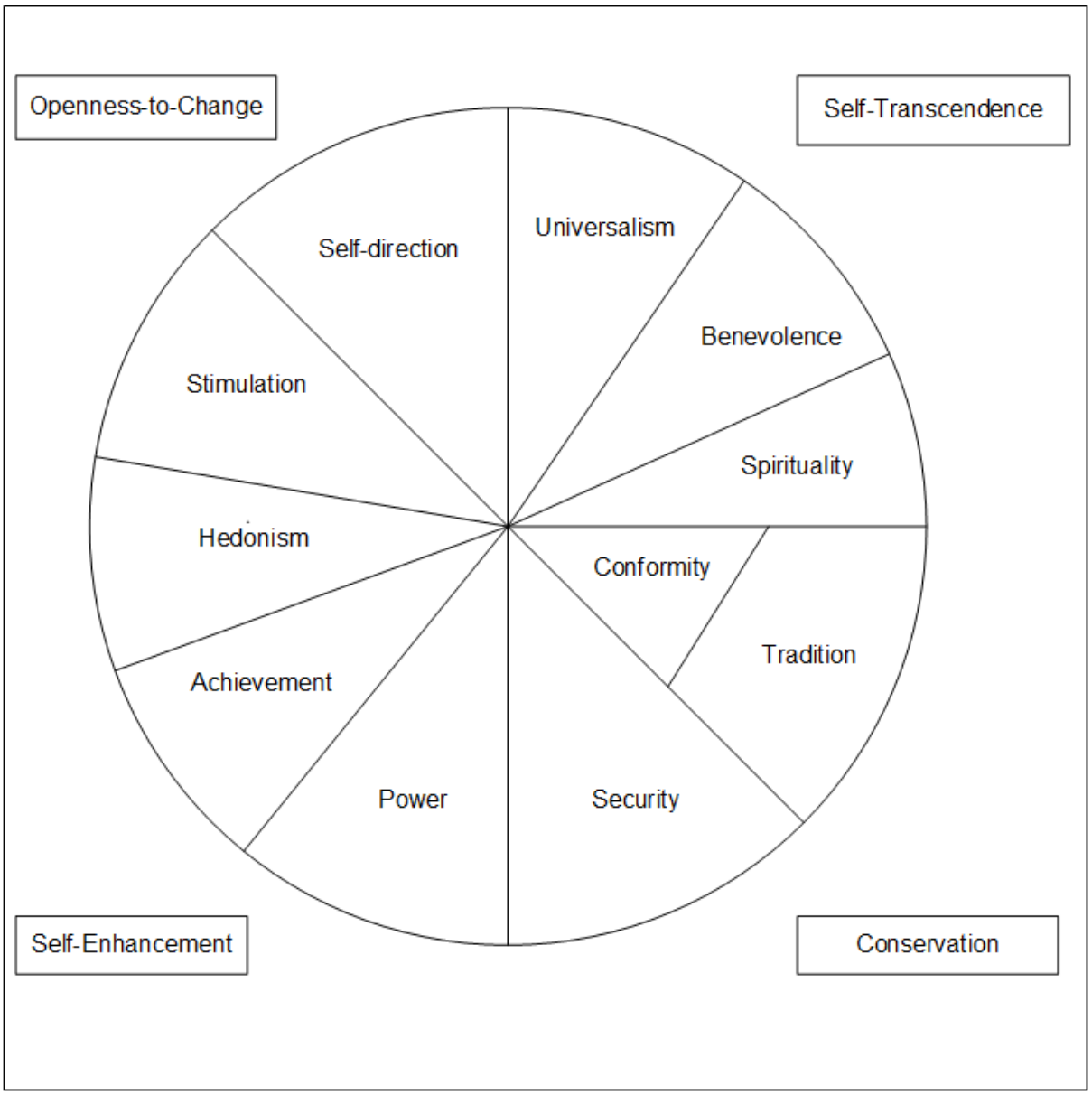


Figure 2.1 Schwartz structure of value interrelations

Values show greater compatibility with each other if they express a more similar motivational goal, and will locate closer to each other in the structure of values. On the other hand, values show greater conflict with each other if they express opposing motivational goals, and will locate further from each other. Values in the structure are also aligned on two major dimensions:

1) **Self-enhancement vs. self transcendence.** This separates values that emphasise advancing self-interests (power, achievement, hedonism) from those that emphasise promoting the interests of others (universalism and benevolence).

2) **Openness-to-change vs. conservation.** This separates values that emphasise independent action, thought and feeling, and embracing new experiences (self-direction, stimulation, hedonism) from those that emphasise self-restriction, order and resistance to change (security, conformity and tradition). Hedonism shares elements of both openness and self-enhancement. Conformity and tradition occupy the same region in the circumference because they have a shared motivation of submitting oneself to an external order: contemporary order, such as professional and organisation rules, in conformity; and time-honoured order, such as culture and religion, in tradition.

Adapted (Schwartz, 1992)

2.2.4 Aim of this study

The primary aim of this study was to identify the collective set of personal and professional values of different healthcare professional groups through a systematic literature review. A previous review identified values of physicians only (Van De Camp, Vernooij-Dassen, Grol, & Bottema, 2004). Personal values are generally identified from literature on human behaviour and interpreted within relevant theories on human behaviour (Rokeach, 1973; Schwartz, 1992). They are applicable to research across different professional groups, but they are not defined within the context of healthcare practice to provide insightful interpretations about decisions on patient care. On the other hand, professional values are typically relevant to the healthcare practice context because they are usually identified from professional ethics codes (Frankel, 1989; Hussey, 1996). However, the ethics codes generally do not cover all values that guide decisions on patient care (Pope & Bajt, 1988).

Therefore, a secondary aim of this study was to integrate the identified personal and professional values of healthcare practitioners into a single comprehensive framework within a validated theory on values (Schwartz, 1992). The new framework for healthcare practitioner values needed to meet the following functions: comprehensively cover all personal and professional values that could influence decisions on patient care; facilitate the measurement of the values within the context of healthcare practice; facilitate interpretation of practitioners' values within both human behaviour and healthcare practice contexts; and provide a theory on which values were likely to be compatible or in conflict with each other in clinical decision-making.

2.3 Methods

2.3.1 Literature Search

Medline, Embase, PsychINFO, CINAHL and ERIC databases were searched for empirical studies, review papers, and letters or opinion papers measuring or discussing values in healthcare using a search strategy developed by a team of researchers who worked on this study. The strategy followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines (Moher, Liberati, Tetzlaff, & Altman, 2009). The search was limited to English language and the last three decades (Jan 1982 to June 2012). The search strategy combined controlled vocabulary terms such as Medical Subject Heading (Mesh) and free text terms for social values, values, professional values, professionalism, ethics, attitudes, student, health professional and health occupations (Figure 2.2 below).

2.3.2 Inclusion criteria

This study focused on identifying lists of values from the literature on healthcare professions. It included all papers that described measurement or review of two or more named values of potential relevance to clinical decision-making. As this study focused on the values themselves rather than the quality of the papers, papers were not excluded on the basis of the quality of research design or reporting, if they were explicit on the value items they discussed or measured (Tong et al., 2010).

1. social values.mp. or Social Values/
2. values.mp.
3. Professional values.mp.
4. "Attitude of Health Personnel"/ or Attitude/ or attitude.mp.
5. (Values and (student$ or physician$ or doctor$ or professional$ or occupational or nurs$ or practice$ or social work$ or physiotherap$ or physical therap$ or mental health or practitioner$)).m_titl.
6. students/ or students, health occupations/ or students, dental/ or students, medical/ or students, nursing/ or students, pharmacy/ or students, premedical/
7. exp Health Occupations/ or exp Health Personnel/ or health professional.mp.
8. Ethics, Professional/ or Ethics, Dental/ or Ethics, Medical/ or Ethics, Clinical/ or Ethics, Nursing/ or Ethics, Institutional/ or Ethics/ or "Codes of Ethics"/ or Ethics, Pharmacy/
9. professionalism.mp.
10. 1 or 2 or 3 or 4
11. 6 or 7
12. 5 and 8
13. 8 and 10 and 11
14. 3 and 9
15. 12 or 13 or 14
16. limit 15 to (English language and yr="1982 -Current")

Figure 2.2 Search Strategy in Medline

In order to identify only the values held by individuals, the values that influence their individual decision-making, the study excluded literature on values around decisions that are imposed on individuals by external forces such as legislation, organisations or communities or the society. Therefore, literature on ethical issues such as abortion, euthanasia, organ donation, assisted reproduction, surrogate decision-making, as well as on community, organisation and societal values was excluded. Literature on non-healthcare students and professionals was also excluded. Finally, the study excluded full papers that discussed values in general but did not name any specific value. It also excluded full papers where a specified value, e.g. caring, was the main focus of the paper, but the paper did not yield any other value items for extraction, and the value under study was identifiable in other papers that had multiple explicit value items.

2.3.3 Study selection

Using the above inclusion criteria, retrieved titles and abstracts were screened for potential papers. The potential abstracts were reviewed by the research team and conflicts were resolved by consensus. Full papers from the selected abstracts were then retrieved and screened. The selected papers were reviewed by the team, and conflicts were resolved by consensus.

2.3.4 Data extraction

A piloted form was used to extract the following characteristics from papers that met the set inclusion criteria: study design; professional group; country where study was undertaken; value type studied; instrument used to measure values; source of value items for instrument;

basis for instrument used; value or value statements. Personal and professional values were also extracted from the papers. Personal values were extracted from items in surveys used to measure personal values. Professional values were extracted from items in surveys, professional ethics codes and professional standards guidelines used to measure professional values. Professional values were also extracted from the body text of qualitative studies and review papers on professional values in clinical education and practice. No qualitative or review papers on personal values of healthcare practitioners were identified.

Within the constraints of a psychological scale, shorter and simpler items are preferable to obtain accurate relevant information (Leung, 2001). Thus, this study aimed to identify single word or short phrase definitions which captured discrete values for accurate measurement. Accordingly, long value statements were coded into shorter items and preferably single word items (e.g. “I belong to a respected profession” was coded to “social recognition”, “foster trust with patients” to “trust”, and “attend to needs for help” to “helpful”). Synonymous value items were also merged into single items. The recoded value items were reviewed by the research team and consensus was reached on the final items through a Delphi-like process (Murry Jr & Hammons, 1995), in which a prepared list of recoded values was given to the team of thesis supervisors and advisors to review. Reviewed items from everyone were collated, and consensus and differences were highlighted. The latter were resolved by discussion and review with the whole team. There may have been a possible confirmation bias with this process as it was not a pure Delphi process - the team of experts employed in the process were three supervisors and one advisor to this thesis. However the team members contributed diverse views and expertise to the task because of their wide range of occupational experiences. This Delphi-like process is used a number of times throughout the

thesis as it was as pragmatic way of sourcing feedback and consensus on the development of some outputs in this thesis.

2.3.5 Synthesis of identified values using Schwartz's values model

Values extracted from the included papers were organised within Schwartz's values model using framework synthesis (Dixon-Woods, 2011). Framework synthesis is a methodology for integrating data from qualitative studies that involves a preliminary identification of themes or a framework against which data from included studies are mapped (Carroll, Booth, & Cooper, 2011; Dixon-Woods, 2011). It has been widely used in systematic reviews of qualitative studies in health policy and education (Brunton, Oliver, Oliver, & Lorenc, 2006; Carroll et al., 2011; Oliver et al., 2008). Framework synthesis using a previously established framework enables large amounts of data to be summarised in a consistent and structured manner within a reasonable timeframe (Carroll et al., 2011). However, framework synthesis does not provide an in-depth analysis of phenomena from participants' view-points, or an understanding of "why" and "how" about the phenomena being studied, as is the case in most qualitative methods. Nevertheless, it was not the objective of this study to answer "why" and "how" values were chosen by particular participants. Rather, *the goal of this study was to organise extracted values into a coherent theoretical framework that facilitated the measurement of values and established a theory on the relations among them*. Therefore, framework synthesis was the best suited analysis method for this goal.

Schwartz previously proposed an eleventh value type of spirituality, but this was not conceived consistently across cultures (Schwartz, 1992). However, because of the possible relevance of this value to patient care (Sheldrake, 2010), it was retained in the Schwartz

values model used for the framework synthesis. In the framework synthesis, each value item extracted from included studies was mapped into the best-fitting Schwartz value type by defining the motivational goal it represented. A Delphi-like process, as before, was used to review the mapping and reach consensus on it as a team. The initial mapping by the candidate was sent to a team of supervisors and advisors to review independently. Their feedback was collated by the candidate and disagreements were resolved by group discussion.

2.3.6 Deriving a new framework for healthcare practitioner values from Schwartz's values model

Following framework synthesis, healthcare practitioner value types were derived from Schwartz's 11 value types. This task took an approach common in instrument development, whereby a Delphi process is used to reach consensus on the instrument items to include. Experts rank items in order to establish priority items for inclusion in the instrument (Yousuf, 2007). In this study, for each set of identified value items mapped into a given Schwartz value type, the top three value items which best characterised the value set within the context of healthcare practice were independently identified and ranked by the candidate and his three supervisors. Ranking was chosen because it forced evaluation and differentiation of the value items by the team. The value rankings from everyone were tallied to get overall ranks within each value set (i.e. identified healthcare practitioner values within a Schwartz value type). Tied ranks were resolved by discussion as a team. The top ranked value in each value set was chosen as the healthcare practitioner value type corresponding to the given Schwartz value type in the new healthcare practitioner values framework developed from framework synthesis. The healthcare practitioner values framework can be employed to measure value priorities of practitioners by asking them to rank the practitioner value types in order of their importance as guiding principles in their clinical practice.

After establishing the values for the healthcare practitioner values framework, a structure of relations among the values was derived, similar to the structure of value relations in Schwartz's values model (Schwartz, 1992). Healthcare practitioner value types were mapped onto positions occupied by corresponding Schwartz values types in Schwartz's theoretical structure of value relations (Figure 2.1). Schwartz's structure of value relations demonstrates four groups of values: values that primarily serve individual interests (self-enhancement values); values that primarily serve collective interests (self-transcendence values); values that emphasise independent thought and flexibility to change (openness-to-change values); and values that emphasise self-restriction, order and resistance to change (conservation) (Schwartz, 2012). The structure further organises values along two bipolar dimensions. The first dimension separates "self-enhancement" values from "self-transcendence" values. The second dimension separates "openness-to-change" values from "conservation" values (Schwartz, 2012).Values within each group are compatible as they share similar motivational goals, and are in conflict with values in the group from which they are separated, as they express opposing motivational goals.

2.4 Results

2.4.1 Literature search and characteristics of included studies

Literature search results are shown in Figure 2.3 below. A total of 9,694 citations were retrieved. Once ineligible and duplicate papers were excluded, there were 50 papers included in the framework synthesis (Aguilar, Stupans, Scutter, & King, 2012; Alfred, Yarbrough, Martin, & Garcia, 2011; Altun, 2002, 2003; Bang et al., 2011; Becker, Kaldenberg, & Connor, 1996; Congress, 1992; DeLisa, Foye, Jain, Kirshblum, & Christodoulou, 2001; Diaz & Stamp, 2004; DiGiacomo, 2004; Eddy et al., 1994; Fagermoen, 1997; Fahrenwald et al.,

2005; Gallagher, 2004; Hartung, Taber, & Richard, 2005; Hoyuelos et al., 2010; Kelly, 1991; Kirkevold, 1992; Langille et al., 2010; Leners, Roehrs, & Piccone, 2006; Lin & Wang, 2010; Lin, Wang, Yarbrough, Alfred, & Martin, 2010; Lui et al., 2008; Martin et al., 2003; McCabe et al., 1992; Moore, 2000; Pang, Senaratana, Kunaviktikul, Klunklin, & McElmurry, 2009; Peloquin, 2007; Raatikainen, 1989; Rassin, 2008, 2010; Robins, Braddock, & Fryer-Edwards, 2002; Rowley et al., 2000; Schank & Weis, 1989; Shahriari, Mohammadi, Abbaszadeh, Bahrami, & Fooladi, 2012; Shaw & Degazon, 2008; Shinyashiki, Mendes, Trevizan, & Day, 2006; Sine & Northcutt, 2008; Stern, 1996; Thurston et al., 1989; Tompkins, 1992; Touchstone, 2010a, 2010b; Valdés, Prilleltensky, Walsh-Bowers, & Rossiter, 2002; Vezeau, 2006; Weis & Schank, 1997, 2000, 2009; Weis, Schank, Eddy, & Elfrink, 1993; Wright & Carrese, 2001).

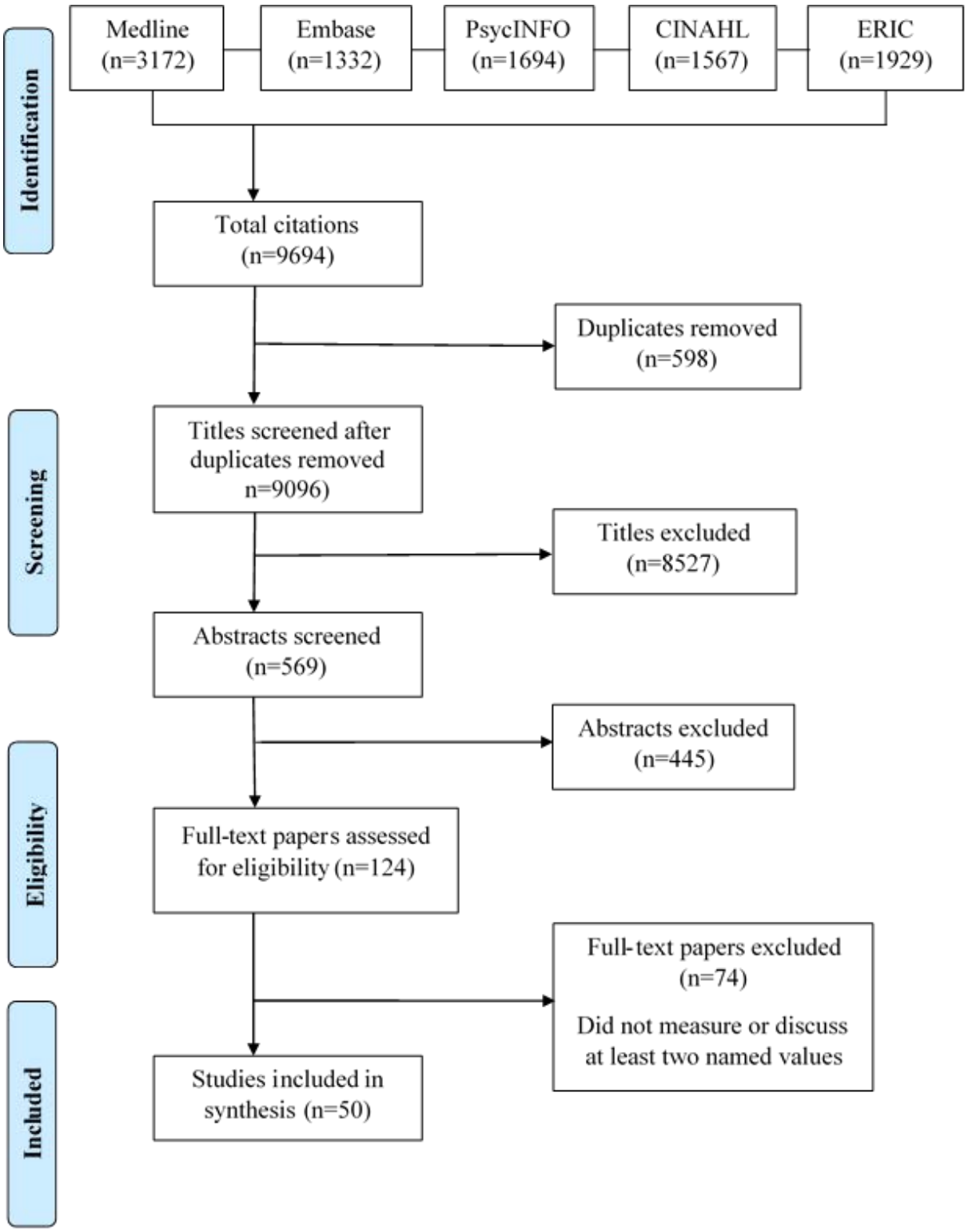


Figure 2.3 Search Results

The characteristics of the included papers are shown in Table 2.2 below. The papers were diverse with respect to study design, country of origin, professional groups studied, and survey instruments used. Most papers identified were from nursing (31, 62%), with 10 (20%) from medical practitioners, and 9 (18%) from allied health professionals. The papers consisted of 11 reviews, 13 qualitative and 26 quantitative research papers. Seventeen quantitative papers measured values using instruments based on professional ethics codes; three used personal values instruments only; three used both ethics code based instruments and personal values instruments; one used a personal values instrument and an instrument developed from consultation; one used a list of values identified from literature; and one used an instrument developed from consultation (Table 2.2).

Table 2.2 Characteristics of included studies

*Abbreviated names are used in the table for the instruments and the sources of the value items. The full names are given below in order of appearance in the table.

Paper	Study Design	Professional Group	Country	Value Type	Values Instrument	Source of values for instrument	Basis for Instrument
Aguilar, A. E. et al. (2012)	Qualitative	Occupational Therapists	Australia	Professional			
Alfred, D. et al. (2011)	Survey	Nurses	USA	Professional	NPVS (Weis)	Ethics Code (ANA)	Professional Ethics Code
Altun, I. (2002,2003)	Survey	Nurses	Turkey	Professional	AACN values	Ethics Code (AACN)	Professional Ethics Code
Bang , K. S et al. (2011)	Survey	Nurses	South Korea	Professional	NPVS (Yeun)	Literature	Other
Becker, B. W. et al. (1996)	Survey	Dentists	USA	Personal	Rokeach Values Survey	Literature on values and psychology theory	Personal Values
Congress, E. (1992)	Review	Social Workers	USA	Professional			
DeLisa , J. A. et al. (2001)	Survey	Physicians	USA	Professional	ABIM values	Ethics Code (ABIM)	Professional Ethics Code
Diaz, J.A. et al. (2004)	Review	Physicians	USA	Professional			
DiGiacomo, M. (2004)	Review	Physical Therapists	USA	Professional			

Paper	Study Design	Professional Group	Country	Value Type	Values Instrument	Source of values for instrument	Basis for Instrument
Eddy, D. M. et al.(1994)	Survey	Nurses	USA	Professional	AACN values	Ethics Code (AACN)	Professional Ethics Code
Fagermon, M. S. (1997)	Survey and Qualitative	Nurses	Norway	Professional			
Fahrenwald, N. L. et al. (2005)	Review	Nurses	USA	Professional			
Gallagher, A. (2004)	Review	Nurses	UK	Professional			
Hartung, P.J. et al. (2004)	Survey	Physicians	USA	Personal	PVIPS	Literature, consultation and psychology theory	Personal Values
Hoyuelos, S. B. et al. (2010)	Survey	Nurses	Spain	Professional	NPVS (Weis)	Ethics Code (ANA)	Professional Ethics Code
Kelly, B. (1991)	Qualitative	Nurses	UK	Professional			
Kirkevold, M. (1992)	Qualitative	Nurses	Norway	Professional			
Langille, A. D. et al. (2010)	Survey	Dentists	Canada	Personal Professional	Schwartz Values Survey DVS	Literature and psychology theory Literature and consultation	Personal Values Other
Leners , D.W. et al. (2006)	Survey	Nurses	USA	Professional	NPVS (Weis)	Ethics Code (ANA)	Professional Ethics Code
Lin, Y. et al. (2010a, 2010b)	Survey	Nurses	Taiwan	Professional	NPVS (Weis)	Ethics Code (ANA)	Professional Ethics Code

Paper	Study Design	Professional Group	Country	Value Type	Values Instrument	Source of values for instrument	Basis for Instrument
Lui , M. H. L. et al. (2007)	Survey	Nurses	Hong Kong	Professional	NCHK values	Ethics Code (NCHK)	Professional Ethics Code
Martin, P. et al. (2003)	Survey	Nurses	USA	Professional	NPVS (Weis)	Ethics Code (ANA)	Professional Ethics Code
McCabe, D. et al. (1992)	Survey	Physicians and Dentists	USA	Personal	Rokeach Values Survey	Literature and psychology theory	Personal Values
Moore, S.M. (2000)	Review	Nurses	USA	Professional			
Pang, D. et al. (2009)	Qualitative	Nurses	China	Professional			
Peloquin, S. M. (2007)	Review	Occupational Therapists	USA	Professional			
Raatikainen, R. (1989)	Review	Nurses	Finland	Professional			
Rassin, M. (2008,2010)	Survey	Nurses	Israel	Personal and Professional	Rokeach Values Survey INU values	Literature and psychology theory Ethics Code (INU)	Personal Values Professional Ethics Code
Robins, L.S. et al. (2002)	Survey and Qualitative	Physicians	USA	Professional	ABIM values	Ethics Code (ABIM)	Professional Ethics Code
Rowley, B. D. et al. (2000)	Survey	Physicians	USA	Professional	AOS values	Consultation	Other
Schank, M. H. et al. (1989)	Survey and Qualitative	Nurses	USA	Professional			

Paper	Study Design	Professional Group	Country	Value Type	Values Instrument	Source of values for instrument	Basis for Instrument
Shahriari, M. et al. (2012)	Qualitative	Nurses	Iran	Professional			
Shaw, H. K. et al. (2008)	Qualitative	Nurses	USA	Professional			
Shinyashiki, G. T. et al. (2006)	Survey	Nurses	Brazil	Professional	NPVS (Weis)	Ethics Code (ANA)	Professional Ethics Code
Sine, D. M. et al (2008)	Qualitative	Paramedics	USA	Professional			
Stern, D. T. (1996)	Qualitative	Physicians	USA	Professional			
Thurston, H. I. et al. (1989)	Survey	Nurses	USA	Personal Professional	Rokeach Values Survey AACN values	Literature and psychology theory Ethics Code (AACN)	Personal Values Professional Ethics Code
Tompkins, E. S.(1992)	Survey	Nurses	USA	Professional	AACN values	Ethics Code (AACN)	Professional Ethics Code
Touchstone, M.(2010a, 2010b)	Review	Paramedics	USA	Professional			
Valdes, L. S. et al.(2002)	Qualitative	Mental Health Practitioners	Cuba	Professional			
Vezeau, T. M. (2006)	Review	Nurses	USA	Professional			
Weis, D. et al. (1993; 1997; 2000; 2010)	Survey	Nurses	USA; USA / UK; USA;	Professional	AACN values; NPVS (Weis); NPVS (Weis);	Ethics Code (AACN; Ethics Code (ANA)	Professional Ethics Code Professional

Paper	Study Design	Professional Group	Country	Value Type	Values Instrument	Source of values for instrument	Basis for Instrument
			USA		NPVS (Weis)		Ethics Code
Wright, S.M. et al.	Survey and Qualitative	Physicians	Canada	Professional			

NPVS = Nurses Professional Values Scale. One scale developed by Weis, D et al, another by Yeun et al

ANA = American Nurses Association

AACN = American Association of Colleges of Nursing

ABIM = American Board of Internal Medicine

PVIPS = Physician Values in Practice Scale

DVS = Dental Values Scale

NCHK = Nursing Council of Hong Kong

INU = Israeli Nursing Union Ethics Committee

AOS = Academic Orthopedic Society

2.4.2 Synthesis of identified values using Schwartz's values model

A total of 170 value items were extracted from the included papers with 128 unique value items remaining after merging synonymous values (Appendix A). The synthesis of extracted values into each Schwartz value type is reported in Table 2.3 below, the mapping rationale for some values into the Schwartz tradition and conformity value types is outlined in Appendix B, and the range of values extracted into the Schwartz framework by professional group, measurement instrument and publication type are reported in Table 2.4.

Table 2.3 Schwartz values types, their motivational goal, extracted healthcare values mapped into each value type, and the derived healthcare practitioner value types

Schwartz value type	Motivational goal	Healthcare practitioner values mapped into Schwartz value type	Healthcare Practitioner value type
Power	Social status and prestige, control or dominance over people and resources	Value items mapped into the power value type included: leadership from nursing, medicine and allied health [1-6]; social or professional status from nursing [7], medicine [3] and dentistry [8,9]; structure or hierarchy from nursing [2] and medicine [3,10,11]; and medical authority or paternalism from medicine [11] and allied health [12,13].	Authority
Achievement	Personal success through demonstrating competence according to social standards	Competence, knowledge and research values were identified across all the professions in the included papers [1, 2, 6, 8, 10, 11, 13-20].	Capability
Hedonism	Pleasure or sensuous gratification for oneself	Pleasure from medicine and dentistry [9, 21]; "I have quality time away from work", "my work brings me pleasure" [8] from dentists."	Pleasure
Stimulation	Excitement, novelty, and challenge in life	Personal and intellectual-stimulation values were mentioned on a Norwegian qualitative study on values central to nursing practice [2]; and "exciting life" from the from nursing, medicine and dentistry that used the RVS framework [4,5,9,21].	Intellectual-stimulation
Self-direction	Independent thought and action - choosing, creating, exploring	Self-direction values from nursing, medicine, dentistry and allied health professions included items on freedom, independence, autonomy, education and self-direction for the patient [1, 2, 4,	Critical thinking

Schwartz value type	Motivational goal	Healthcare practitioner values mapped into Schwartz value type	Healthcare Practitioner value type
		5, 9, 11, 14, 18, 19, 21-32]. Self -oriented values for self-direction included critical thinking [11, 33], problem-solving [1, 17], imagination and creativity [3, 14], objectivity [13], self-regulation [6], and control of one's own work [3].	
Universalism	Understanding, appreciation, tolerance, and protection for the welfare of all people and for nature	Value items expressing acceptance of others, respect for others, advocacy, equality, equity, social justice, and upholding human dignity and patient rights were identified across all professions in the included studies [1, 8-11, 13, 15, 17-19, 21, 29-31, 34-45]. Charity [17], socialism, solidarity, humanism [19] were other universalism values extracted.	Equality
Benevolence	Preservation and enhancement of the welfare of people with whom one is in frequent personal contact	Many articles across the professions indicated the benevolent values of caring, helping, empathy, altruism and compassion [1-6, 8, 10, 11, 13-20, 22-24, 27-29, 31, 34, 37, 42, 46, 47]. Some value items that stood out included; "attending to needs for help" [2] and helping people in "little things" [23] from nursing; and "primacy of patient welfare" [34] from medicine.	Altruism
Tradition	Respect for, commitment to, and acceptance of the customs and ideas that traditional culture or religion provides	Values of honour, integrity, honesty and morality were common across the professions [6, 8, 10, 11, 17, 18, 29, 31, 47-49]. Other tradition values were duty [6, 10, 17], humility [1], temperance [17], and "ethics grounded in culture and history" [19].	Morality

Schwartz value type	Motivational goal	Healthcare practitioner values mapped into Schwartz value type	Healthcare Practitioner value type
Conformity	Restraint of actions, inclinations, and impulses likely to upset or harm others and violate social expectations or norms	A value of adherence to standards and professional code was extracted from papers from nursing [38-40, 43]. Self-discipline [14, 22], and "fitting in" and "going along" [23] were also identified from nursing. Professional behaviour and accountability values were extracted from nursing [18, 32], medicine [10, 15, 17] and allied health [1, 6]. Other conformity values identified were self-awareness and team-work [11] and "I behave ethically" [8] from medicine and dentistry, respectively.	Professionalism
Security	Safety, harmony, and stability of society, of relationships, and of self	Confidentiality and patient privacy were identified as important values across nursing, medicine and allied health [4, 5, 10-12, 18, 20, 31, 32, 37-39, 43, 50]. Patient safety items were identified from nursing - "protect public from unsafe health products or practices" [20], and "provide safe and competent care" [25]. Security, "protection of the environment", emotional stability, prudence, vigilance, self-protection were further values identified from medicine and nursing [4, 5, 9, 11, 17, 21, 48]. Financial security values - "well-paid", "financial stability" and "earn a good living" were identified from dentists [8], whilst "personal financial perks and gains", and "a comfortable lifestyle" were identified from physicians [3].	Safety
Spirituality	Meaning, coherence and inner harmony through transcending	Only a few papers had items on spirituality. Spiritual reward [7], "fulfilling spiritual need of patients", "spiritual empowerment" [18], holism	Spirituality

Schwartz value type	Motivational goal	Healthcare practitioner values mapped into Schwartz value type	Healthcare Practitioner value type
	everyday reality	[48], hope [2], and religion and faith [46] were identified from nurses. Other spirituality values identified were optimism from physicians [11], "have harmony in life" from dentists [8], and inner harmony and salvation [9, 21] from the RVS for nurses, physicians and dentists [4, 5, 9, 21].	

Source for Schwartz value types and their motivational goals (Schwartz, 1992)

Cited papers in the table

(1) Aguilar A, et al (2012); (2) Fagermoen MS (1997); (3) Hartung PJ, et al (2005); (4) Rassin M (2008); (5) Rassin M (2010); (6) DiGiacomo M (2004);(7) Bang KS, et al (2011); (8) Langille AD, et al (2010); (9) Becker BW, et al (1996); (10) Robins LS, et al (2002); (11) Stern DT (1996); (12) Congress E (1992); (13) Sine DM, et al (2008); (14) Altun I (2003); (15) DeLisa JA, et al (2001); (16) Peloquin SM (2007); (17) Rowley BD, et al (2000); (18) Shahriari M, et al (2012); (19) Valdés LS, et al (2002); (20) Weis D, et al (2000); (21) McCabe DL, et al (1992); (22) Altun I (2002); (23) Kelly B (1991); (24) Kirkevold M (1992); (25) Lui MHL, et al (2008); (26) Moore SM (2000); (27) Pang D, et al (2009); (28) Raatikainen R (1989); (29) Thurston HI, et al (1989); (30) Vezeau TM (2006); (31) Weis D, et al (1993); (32) Alfred D, et al (2011); (33) Shinyashiki GT, et al (2006); (34) Diaz JA, et al (2004); (35) Eddy DM, et al (1994); (36) Fahrenwald NL, et al (2005); (37) Leners DW, et al (2006); (38) Lin Y, et al (2010); (39) Lin YH, et al (2010); (40) Shaw HK, et al (2008); (41) Tompkins ES (1992); (42) Touchstone M (2010); (43) Weis D, et al (1997); (44) Wright SM, et al (2001); (45) Gallagher A (2004); (46) Schank MJ, et al (1989); (47) Touchstone M (2010); (48) Hoyuelos SB, et al (2010); (49) Martin P, et al (2003); (50) Weis D, et al (2009)

Table 2.4 Range of healthcare practitioner values by professional group and values instrument or type of publication paper

Professional group	Instrument / Paper Type	Power	Achievement	Hedonism	Stimulation	Self-direction	Universalism	Benevolence	Tradition	Conformity	Security	Spirituality
All	Rokeach Values Survey [4, 5, 9, 21, 29]	X	X	X	X	X	X	X	X	X	X	X
Nurses	Nursing Professional Values Scale (Weis) [20, 32, 33, 37-39, 43, 48-50]		X			X	X	X	X	X	X	
	Nursing Professional Values Scale (Yeun) [7]	X	X			X	X	X	X	X		X
	American Association of Colleges of Nursing (AACN) values [14, 22, 29 -31, 35, 36, 40, 41]		X			X	X	X	X	X	X	
	Nursing Council of Hong Kong values [25]		X			X	X	X	X	X	X	
	Israeli Nursing Union values [4, 5]	X	X			X	X	X	X	X	X	
	Qualitative [2, 18, 23, 24, 27, 40, 46]	X	X		X	X	X	X	X	X	X	X
	Review [26, 28, 30, 36, 45]		X			X	X	X				X
Physicians	American Board of Internal Medicine (ABIM) values [10, 15]	X	X			X	X	X	X	X	X	
	American Orthopaedic Society values [17]		X			X	X	X	X	X	X	
	Physician Values in	X	X			X	X	X			X	

Professional group	Instrument / Paper Type	Power	Achievement	Hedonism	Stimulation	Self-direction	Universalism	Benevolence	Tradition	Conformity	Security	Spirituality
	Practice Scale [3]											
	Qualitative [11, 44]	X	X			X	X	X	X	X	X	X
	Review [34]		X			X	X	X	X	X	X	
Dentists	Dental Values Scale [8]	X	X	X			X	X	X		X	X
Allied Health	Qualitative [1, 13, 19]	X	X			X	X	X	X	X		
	Review [6, 12, 16, 42, 47]	X	X			X	X	X	X	X	X	

X = The Schwartz value type extracted from paper

Cited papers in the table

(1) Aguilar A, et al (2012); (2) Fagermoen MS (1997); (3) Hartung PJ, et al (2005); (4) Rassin M (2008); (5) Rassin M (2010); (6) DiGiacomo M (2004);(7) Bang KS, et al (2011); (8) Langille AD, et al (2010); (9) Becker BW, et al (1996); (10) Robins LS, et al (2002); (11) Stern DT (1996); (12) Congress E (1992); (13) Sine DM, et al (2008); (14) Altun I (2003); (15) DeLisa JA, et al (2001); (16) Peloquin SM (2007); (17) Rowley BD, et al (2000); (18) Shahriari M, et al (2012); (19) Valdés LS, et al (2002); (20) Weis D, et al (2000); (21) McCabe DL, et al (1992); (22) Altun I (2002); (23) Kelly B (1991); (24) Kirkevold M (1992); (25) Lui MHL, et al (2008); (26) Moore SM (2000); (27) Pang D, et al (2009); (28) Raatikainen R (1989); (29) Thurston HI, et al (1989); (30) Vezeau TM (2006); (31) Weis D, et al (1993); (32) Alfred D, et al (2011); (33) Shinyashiki GT, et al (2006); (34) Diaz JA, et al (2004); (35) Eddy DM, et al (1994); (36) Fahrenwald NL, et al (2005); (37) Leners DW, et al (2006); (38) Lin Y, et al (2010); (39) Lin YH, et al (2010); (40) Shaw HK, et al (2008); (41) Tompkins ES (1992); (42) Touchstone M (2010); (43) Weis D, et al (1997); (44) Wright SM, et al (2001); (45) Gallagher A (2004); (46) Schank MJ, et al (1989); (47) Touchstone M (2010); (48) Hoyuelos SB, et al (2010); (49) Martin P, et al (2003); (50) Weis D, et al (2009)

2.4.3 Healthcare practitioner values framework

Following framework synthesis, the following healthcare practitioner value types were derived from corresponding Schwartz value types (given in parentheses): authority (power), capability (achievement), pleasure (hedonism), intellectual-stimulation (stimulation), critical thinking (self-direction), equality (universalism), altruism (benevolence), morality (tradition), professionalism (conformity), safety (security) and spirituality (spirituality) - Table 2.3 above. The ranking results to label healthcare practitioner value types for each Schwartz category of extracted values are shown in Table 2.5 below.

Table 2.5 Deriving healthcare practitioner value types for the healthcare practitioner values framework

Schwartz group for healthcare values	Rank of value by relevance to healthcare practice*	Healthcare practitioner value type
Power		Authority
Authority	1	
Power	1	
Social recognition/Status/Image	2	
Leadership	3	
Achievement		Capability
Capability/Competency/Effectiveness	1	
Achievement/Accomplishment	2	
Excellence	3	
Hedonism		Pleasure
Pleasure/Enjoyment		
Stimulation		Intellectual-stimulation
Intellectual-stimulation	1	
Personal stimulation	2	
Excitement	3	
Self-Direction		Critical thinking
Critical Thinking/Problem-solving	1	
Decision-making	2	
Freedom/Autonomy/Independence	3	
Universalism		Equality
Equality/Equity/Equanimity	1	
Justice/Rights/Fairness/Ethical	1	

Schwartz group for healthcare values	Rank of value by relevance to healthcare practice*	Healthcare practitioner value type
Dignity	2	Equality
Activism/Advocacy	3	
Benevolence		Altruism
Altruism	1	
Empathy	2	
Benevolence	3	
Reliability/Dependability	3	
Spirituality		Spirituality
Spirituality	1	
Optimism	2	
Faith	3	
Tradition		Morality
Integrity	1	
Morality	1	
Beneficence	2	
Nonmaleficence	3	
Tradition/Culture	3	
Conformity		Professionalism
Professionalism	1	
Duty/Service/Obligation	2	
Conformity	3	
Security		Safety
Safety	1	

Schwartz group for healthcare values	Rank of value by relevance to healthcare practice*	Healthcare practitioner value type
Confidentiality	2	Safety
Security/Prudence	3	
Protection	3	

* Overall rank of value by its relevance to healthcare practice from four team members

Across healthcare professions, altruism, equality and capability were the most prominently identified healthcare practitioner value types from the reviewed literature (Table 2.4). Specific altruism values included altruism, compassion, caring and empathy; equality values included equality, human dignity, respect, and social justice; and capability values included excellence, competency and knowledge (Table 2.3). Morality and professionalism value types were also commonly identified across professional groups (Table 2.4).

Derived from Schwartz's self–direction value type, the healthcare practitioner critical thinking value type included self-direction values for both the practitioner and the patient (Table 2.3). The safety healthcare practitioner value type was commonly identified within the context of patient safety, privacy and confidentiality (Table 2.3). Authority, intellectual-stimulation, pleasure and spirituality value types were identified less frequently than other values in the included papers (Table 2.4).

A theoretical structure of healthcare practitioner value relations derived from Schwartz's values model (Schwartz, 1992) is shown in Figure 2.4 below. The structure groups authority, capability, and pleasure into self-enhancement values as they emphasise advancing self-interests; and equality and altruism into self-transcendence values as they emphasise concern for the welfare and interests of others. Critical thinking, intellectual-stimulation and pleasure are grouped into openness-to-change values as they emphasise independent action, thought and new experiences; and spirituality, morality, professionalism and safety are grouped into conservation values as they emphasise order and preservation of traditions. Pleasure was placed in both self-enhancement and openness-to-change groups, as it shares emphases with both groups (Schwartz, 1992).

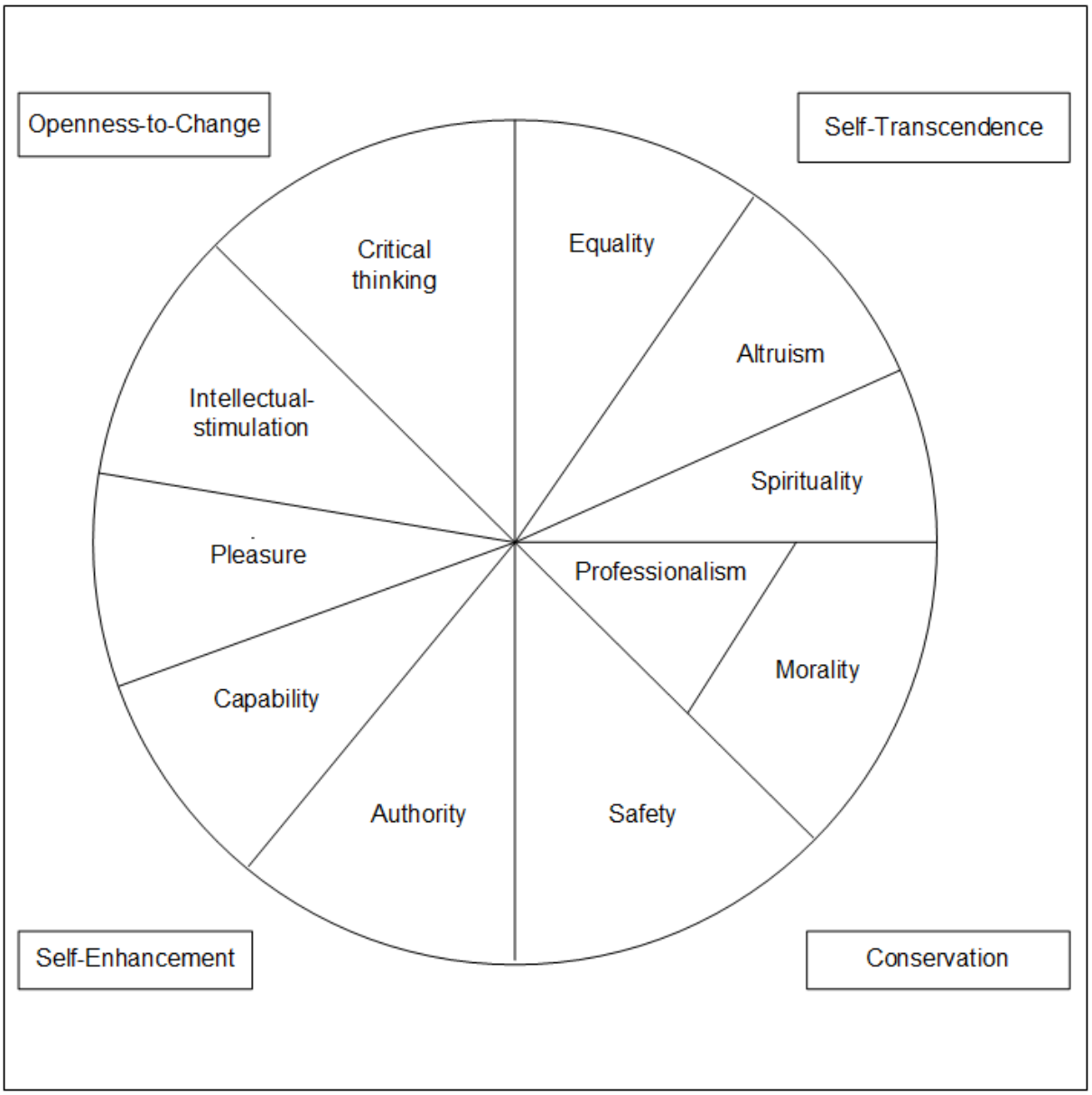


Figure 2.4 Theoretical structure of value interrelations in the healthcare practitioner values framework

The structure is derived from Schwartz's values model by mapping healthcare practitioner value types onto positions that are occupied by their matching value types in Schwartz's values model (see Figure 2.1). Healthcare practitioner values show greater compatibility with each other if they express more similar motivational goals, and locate closer to each other in the structure of values. On the other hand, values show greater conflict with each other if they express opposing motivational goals, and will locate further from each other. Values in the structure are also aligned on two major dimensions:

1) **Self-enhancement vs. self-transcendence.** This separates values that emphasise advancing self-interests (authority, capability, pleasure) from values that emphasise concern for the welfare and interests of others (equality, altruism).

2) **Openness-to-change vs. conservation.** This separates values that emphasise independent action, thought and feeling, and embracing new experiences (critical thinking , intellectual-stimulation, pleasure) from those that emphasise self-restriction, order and resistance to change (safety, professionalism, morality, spirituality). Pleasure shares elements of both openness and self-enhancement. Professionalism and morality occupy the same region in the circumference because they have a shared motivation of submitting oneself to an external order: contemporary order, such as professional and organisation rules, in professionalism; and time-honoured order, such as culture and religion, in morality.

Adapted (Schwartz, 1992).

2.5 Discussion

This study identified a comprehensive set of personal and professional values across healthcare professional groups and integrated them into a single framework derived from Schwartz's values model (Schwartz, 1992). Eleven healthcare practitioner value types were derived (authority, capability, pleasure, intellectual-stimulation, critical thinking, equality, altruism, morality, professionalism, safety and spirituality) together with a structure of compatible and conflicting relations among them.

The values considered most relevant to healthcare practitioners in the reviewed literature were altruism, equality and capability. These values are explicit in many professional ethics codes and education standards of healthcare professionals (Rassin, 2008, 2010; Robins et al., 2002; Rowley et al., 2000; Schank & Weis, 1989; Shahriari et al., 2012; Shaw & Degazon, 2008; Shinyashiki et al., 2006; Sine & Northcutt, 2008). The motivational goals of altruism and equality (derived from Schwartz' benevolence and universalism values, respectively) are centred on selfless consideration of others' welfare, and respect for everyone's worth (Schwartz, 1992). These goals are synonymous with those of healthcare practitioners in general – selflessly promoting the wellbeing and dignity of the patients, their families and their communities (Medicine, 2002; Pellegrino, 2001).

Altruism and equality values were generally more emphasised than capability and critical thinking values in the included studies. The more technically oriented values of capability (e.g. competence, intelligence) and critical thinking (e.g. problem-solving, objectivity) may be taken as given, because of the minimum standards of qualification and competency

mandated for healthcare professionals in most modern countries. For instance, patients generally expect to receive service from qualified and competent persons when they visit healthcare facilities (Paterson, 2012), hence literature on values in healthcare may tend to emphasise humanistic more than competency values (Dossetor, 1997; Markakis, Beckman, Suchman, & Frankel, 2000).

Other values considered important to all healthcare practitioners in the reviewed papers were morality and professionalism, critical thinking and safety. Morality and professionalism are significant values in healthcare practice, because healthcare professionals have to display the virtues and high ethical standards expected of them by the public (Swick, 2000). Critical thinking was frequently discussed within the context of supporting patients' autonomy, whilst safety was discussed within the context of patient safety, privacy and confidentiality. These observations highlight the emphasis presently placed on respecting patients' values and rights, and ensuring them safe and quality healthcare (Committee on Quality Health Care in America, 2001; Paterson, 2012).

Healthcare practitioner value types of authority, intellectual-stimulation, spirituality and pleasure were identified less frequently than other values. They were generally less pronounced in professional ethics based instruments (DeLisa et al., 2001; Martin et al., 2003; Weis & Schank, 2009) compared to personal value instruments (Becker et al., 1996; McCabe et al., 1992; Rassin, 2008; Thurston et al., 1989). These values may receive limited attention in professional ethics based value instruments, partly because they express motivational goals that conflict with some of the prominent values in healthcare practice. For instance, practitioners' authority values may oppose values supporting patient autonomy and self-

direction (critical thinking value type in our framework) (Beisecker, 1990; Deber, 1994a). Similarly, stimulation values may oppose professionalism values that seek adherence to set standards; and spirituality values may oppose the more rational capability values. Another possible explanation is that the values identified in the literature are subject to reporting bias, and the values that writers report in literature may be different from the ones practitioners present in practice. A value like spirituality may be reported less in literature because practitioners may prefer to keep their religious beliefs separate from their professional lives (Cadge, Ecklund, & Short, 2009).

A theoretical structure of healthcare practitioner value relations (Figure 2.4) summarises the value conflicts described above. The structure generally suggests how values that are predominantly personal in nature, such as authority, pleasure, morality and spirituality, interact with values such as altruism, equality and capability, that are strongly promoted by professional groups. In agreement with some literature, this structure indicates possible conflicts between self-interest values and altruistic values (Coulehan & Williams, 2001, 2003), and conflicts between values embracing independent action and change, and values preserving traditions and stability (Rosenbaum et al., 2004; Savulescu, 2006). Examples of such conflicts include practitioners prioritising personal rewards over service to the patient (Coulehan & Williams, 2001), students reconciling altruistic values promoted in formal education with self-interest values they observe in mentors in clinical practice (Coulehan & Williams, 2003), and practitioners prioritising relationships with colleagues who show unprofessional conduct over initiating appropriate corrective actions (Rosenbaum, Bradley, Holmboe, Farrell, & Krumholz, 2004).

The values identified across healthcare professional groups in this review are broadly similar to those identified by a systematic review on elements of professionalism for physicians (Van De Camp et al., 2004). Altruism, accountability, respect and integrity were the most frequent values in the mentioned review (Van De Camp et al., 2004), corresponding to altruism, professionalism, equality and morality in the healthcare practitioners' values framework in this study.

2.5.1 Strengths and limitations

Papers included in this study were from nursing, medicine, dentistry and allied health professions. However, most were from nursing, and no papers were identified from some healthcare professional groups such as pharmacy, although this was included in the search strategy. Also noted was that half the included papers were from the USA. The high proportion of papers from nursing and papers from the USA present potential biases in the values identified, but they represent the published literature within our search strategy - which did not include any known bias towards or against any particular healthcare profession or country.

The Delphi-like process used to gather feedback and consensus in this study had a potential of introducing confirmation bias in the consensuses reached. This bias was possible because the team of reviewers was small, and the reviewers were also part of the research team. However, the process was a pragmatic effort to involve other expertise other than the candidate's in the development of this work.

This study has a number of strengths. It followed robust methods in the literature search, and in the extraction and synthesis of values. The new framework for healthcare practitioner values is comprehensive in its coverage of values, because the values were identified from a range of professional ethics codes, personal value studies, qualitative research studies, literature reviews, and letter and opinion papers from prominent healthcare professional groups. The individual papers from which the values were extracted used a variety of methods to identify values including professional ethics codes (Leners et al., 2006; Y. Lin et al., 2010; Weis & Schank, 2000), theories on human behaviour (Rokeach, 1973; Schwartz, 1992), participant observation (Stern, 1996), literature review (Bang et al., 2011) and stakeholder consultation (Langille et al., 2010), enabling this study to consolidate other works that used varying methods to identify values.

In summary, the new values framework established in this study consolidates values identified across a range of healthcare professions into a single comprehensive framework that also incorporates practitioners' personal values. Attention to specific values prioritised by single professions may be lost in a generic comprehensive framework. However, Schwartz's well-established values model (Schwartz, 1992) was used to integrate identified values, and the model has been shown to generically apply across cultures, and is thus likely to be of relevance across the different cultures of healthcare professional groups (Schwartz, 1992; Schwartz et al., 2001; Schwartz & Sagiv, 1995).

2.5.2 Implications

This study contributes to methodology on research on values of healthcare practitioners in two significant ways: first, by establishing a single framework for personal and professional

values of healthcare practitioners that can be used to study practitioner values across different professional groups; and second, by conceptualising the values of healthcare practitioners within a defensible psychological theory, Schwartz's values model, that can improve the interpretation of practitioner value assessments. For example, the theoretical structure of value relations can allow researchers to hypothesise on which practitioner values may agree or conflict when assessed in specific contexts such as medical rationing or job burnout.

In interprofessional healthcare education, educators can use the multi-professional values framework established in this study to assess personal and professional values across healthcare professional groups, compare value priorities of different healthcare professional groups, and develop shared education strategies on values across professional groups. Professional socialisation in healthcare education frequently exposes students to conflicting values (Borgstrom, Cohn, & Barclay, 2010; Coulehan & Williams, 2003). Understanding which values are potentially compatible or in conflict in clinical practice can assist educators design socialisation processes that help students understand and manage value conflicts that they are likely to encounter in practice. The values framework established in this study provides a theoretical framework on how different values may agree or conflict in decision-making to support such understanding.

In multi-disciplinary clinical practice, challenges in decision-making frequently arise from a lack of a common values framework guiding decision-making across professional groups (Berwick et al., 1997; McNair, 2005; Glen, 1999). This study established a common framework for healthcare practitioners' values. This framework can help different professional groups understand each other's value priorities better so they can facilitate

improvements in interprofessional teamwork and decision-making, and enhance the quality of patient care. Furthermore, clinical practice frequently challenges the boundary between practitioners' personal and professional values (Pipes et al., 2005). There is need to improve practitioners' awareness of their personal and professional values, and the possible compatibilities and conflicts among these values in clinical practice, to help them negotiate the best possible decisions for their patients. This study provides a theoretical framework to help researchers investigate and understand such value relations in clinical practice.

Future directions from this work will involve the development and validation of an instrument to measure healthcare practitioner values from our framework. This validation should empirically test the applicability of Schwartz's values model (Schwartz, 1992) to the study of healthcare practitioners' values, as well the ability to interpret the derived healthcare practitioner value types within healthcare practice contexts.

2.6 Conclusion

This study identified personal and professional values across different healthcare professional groups, and established a theoretically informed framework that organises the values to facilitate their measurement as well as suggest possible compatible and conflicting relations among them. This framework can enhance the study and assessment of personal and professional values in healthcare education and practice to improve practitioners' clinical decision-making at both individual and interprofessional practice levels.

Chapter 3. Study two: Validation of an instrument to measure healthcare practitioners' values

3.1 Chapter outline

This chapter reports a study evaluating the use of the healthcare practitioners' values framework from Chapter 2 as an instrument for measuring healthcare practitioners' values, the Healthcare Practitioner Values Scale (HPVS) (Moyo, Goodyear-Smith, Weller, & Shulruf, 2016b). The only additional step that followed from the framework reported in Chapter 2 was providing descriptors for the 11 values in the framework and an anchor statement to facilitate the use of the framework as a self-report survey instrument.

3.2 Introduction

The present study explored the validity of an instrument for measuring healthcare practitioners' personal and professional values, the Health Practitioner Values Scale (HPVS).

3.2.1 Background on values and decision-making in healthcare

Personal and professional values of healthcare practitioners influence their decisions on patient care (Gross & Robinson, 1987; Smith et al., 1991). Practitioners who are aware of how their own values influence patient care decisions may be better able to provide patient-centred care (Epstein, 1999). Furthermore, modern patient care is mostly delivered by multi-professional healthcare teams. Therefore a common approach to education and measurement of practitioner values could improve patient-centred care in the context of multi-disciplinary

care (Glen, 1999; McNair, 2005). This study presents an instrument to measure healthcare practitioners' personal and professional values within a single theoretical framework for values, and within the context decision-making in healthcare practice (Moyo, Goodyear-Smith, Weller, Robb, et al., 2016).

Educators require valid instruments to assess the learning of values by students and evaluate efficacy of teaching courses (Arnold, 2002). Valid measurement of values helps to improve the decision-making skills of the students, the teaching curricula on values, and the level of professionalism in clinical practice (Lynch et al., 2004). Presently, instruments are available to separately measure personal values (Rokeach, 1973; Schwartz, 1992) or professional values of healthcare practitioners (Langille et al., 2010; McCabe et al., 1992; Rassin, 2008; Weis & Schank, 2000). Personal value instruments measure a broad range of values important to individuals in general life contexts (Rokeach, 1973; Schwartz, 1992). They are usually developed from theories on human behaviour, and are applicable to all professional groups. However, their content is not defined within the context of healthcare practice to enable them to elaborate effectively on decisions on patient care. On the other hand, most professional value instruments only cover a limited set of values defined in professional ethical codes (DeLisa et al., 2001; Rowley et al., 2000; Weis & Schank, 2000); these codes represent a subset of the practitioners' values that guide decisions on patient care (Pope & Bajt, 1988).

There is evidence suggesting that clinical decision-making by practitioners is influenced by both their personal and professional values (Gross & Robinson, 1987; Smith et al., 1991). An instrument that measures both personal and professional values of healthcare practitioners,

and is interpretable within both human behaviour and healthcare practice contexts could help educators understand the comprehensive range of values that affect practitioners' clinical decision-making, and could help practitioners appreciate the values they bring into clinical decisions so they can reflect on these values and their patients' values to deliver patient-centred care (Epstein, 1999). Furthermore, a common instrument to measure practitioners' values across healthcare professional groups could help improve interprofessional practice and quality of patient care in several ways, including enabling educators to compare values of different healthcare professionals, helping educators develop and evaluate common strategies for teaching values across professional groups, and helping different healthcare professional groups understand each other's value priorities (Glen, 1999; Hall, 2005; McNair, 2005).

3.2.2 Background on the Healthcare Practitioner Values Scale

The instrument for which evidence of validity is sought in this study, entitled the HPVS, uses the healthcare practitioner values framework developed in Chapter 2, to measure both personal and professional values of healthcare practitioners. An additional step undertaken to establish the HPVS as an instrument for use in this study, was the addition of descriptors for the value items in the healthcare practitioner values framework from Chapter 2 –Table 3.1. Schwartz's values model (Schwartz, 1992), a validated theory on personal values, provides the theoretical framework for the HPVS; whilst the content of the HPVS is derived from healthcare literature, and further defined within the context of healthcare (Chapter 2). Values defined in Schwartz's values model are principally measured using the Schwartz Values Survey (SVS) (Schwartz, 1992). The HPVS measures 11 healthcare practitioner values corresponding to 11 broad values in the SVS (Table 3.1.)

Table 3.1 Items for the HPVS developed by mapping personal and professional values identified from healthcare literature into Schwartz's values model

SVS value	Schwartz value motivational goal	HPVS value item
Benevolence	Preservation and enhancement of the welfare of people with whom one is in frequent personal contact	Altruism (selfless concern for the welfare of others)
Power	Social status and prestige, control or dominance over people and resources	Authority (the right to lead or command)
Achievement	Personal success through demonstrating competence according to social standards	Capability (competent, effective and efficient)
Self-direction	Independent thought and action - choosing, creating, exploring	Critical Thinking (application of sound and objective reasoning in making judgements)
Universalism	Understanding, appreciation, tolerance, and protection for the welfare of all people and for nature	Equality (equal opportunities for all)
Stimulation	Excitement, novelty, and challenge in life	Intellectual-stimulation (enjoying a mental challenge)
Tradition	Respect for, commitment to, and acceptance of the customs and ideas that traditional culture or religion provides	Morality (belief in some conduct being right or wrong, and the desire to do right)
Hedonism	Pleasure or sensuous gratification for oneself	Pleasure (gratification of desires)
Conformity	Restraint of actions, inclinations, and impulses likely to upset or harm others and violate social expectations or norms	Professionalism (highest standards of ethical and professional behaviour)
Security	Safety, harmony, and stability of society, of relationships, and of self	Safety (protection of self and others from risk or harm)
Spirituality	Meaning, coherence and inner harmony through transcending everyday reality	Spirituality (belief in meaning of life higher than everyday existence)

Source for SVS items and descriptions (Schwartz, 1992)

3.2.3 Aim of this study

The aim of this study was to assess the content validity and construct validity of the HPVS. Because the HPVS employs Schwartz's values model as a theoretical framework, the validity of the HPVS was explored by using the SVS as a reference instrument. We posed the following research questions, the first addressing content validity of the HPVS, and the last two addressing its construct validity:

1) To what extent does Schwartz's values model apply to healthcare practitioners as a specific group?

2) To what extent is the HPVS correlated with the SVS?

3) To what extent is the structure of value interrelations within the HPVS correlated with the structure of value interrelations within the SVS?

3.3 Methods

3.3.1 Survey procedures

Students and staff who are healthcare professionals at the Faculty of Medical and Health Sciences at the University of Auckland in New Zealand, and members of The Royal New Zealand College of General Practitioners (RNZCGP) were invited to participate in an anonymous online survey. Students from medicine, optometry, pharmacy and nursing undergraduate programmes, and students from an audiology postgraduate programme were invited via class e-mail lists; faculty staff were invited via a staff e-mail list; and RNZCGP members were invited via a post on the College website. The study was approved by the University of Auckland Human Participants Ethics Committee (Reference – 010359/2013).

The questionnaire comprised of three sections:

1. Healthcare Practitioner Values Scale (HPVS). The HPVS measured participants' personal and professional values within the context of healthcare practice. Participants were asked to rank 11 values in the HPVS (Table 3.1 - above) according to each value's importance to them as a guiding principle in their healthcare practice - giving the value most important to them a rank of 1 and the value least important to them a rank of 11. A list of the 11 values with a column for writing rank positions was preceded by a statement which read: "Importance to me as guiding principle in my clinical / health practice". This statement was chosen because values are organised in relative importance to one another (Schwartz, 1992). Descriptors for the value items for the HPVS were developed through a Delphi-like process as used in the previous chapter (see 2.4), in which the candidate suggested the initial descriptors and gathered independent feedback from his team of supervisors. Disagreements on the descriptors were resolved by discussion as a team.

2. Schwartz Values Survey (SVS). The SVS, based on Schwartz's values model, measured participant's personal values within a general life context. Fifty-eight SVS value items measure Schwartz's 11 broad values (Appendix C). Participants were asked to rate each value item on their importance as guiding principles in their life. The responses were measured on a 9 point scale (-1=value is opposed to my principles, through 0=value is not an important at all to me, to 7 = value is of supreme importance as a guiding principle). A list of the 58 values with columns for selecting a rating score was preceded by a statement which read: "Importance to ME as a guiding principle in MY life"

3. Demographic details. Demographic details including participants' age and programme of study or profession were collected in the last section of the survey.

3.3.2 Validity investigations

Content and construct validity of the HPVS were investigated from the collected survey data. Before statistical analysis, responses in which participants rated at least 21 SVS value items with a 7 or used the same rating on at least 35 items were removed because such responses indicate a poor effort by respondents to differentiate their values (Schwartz, 1992). All statistical procedures were carried out using R Statistical Software (R Development Core Team, 2014).

3.3.2.1 Content validity – To what extent is Schwartz values model applicable to healthcare practitioners as a specific group?

In this analysis, the SVS was used as a reference for the content of the HPVS. To determine the extent to which Schwartz's values model was applicable to healthcare practitioners as a theoretical framework for organising their values, non-metric multi-dimensional scaling (MDS) was performed on SVS measurements. MDS is a technique used to visualise the degree of similarity of elements in a dataset (Young, 1985). MDS is usually used to visualise objects in data in two dimensions. The distances between any two objects in the data are maintained as closely as possible to those in the original high-dimensional dataset. MDS has its origins in psychometry but has found wide applications in other fields such as sociology, physics, political science, biology, and marketing (Young, 2013).

A simple example of MDS would be to imagine a room full of people, and the people could float, and were in different spaces in the room. It would be hard for someone watching from outside to decide which people were closer to each other. However if the distances between all these people were reproduced in just two dimensions (for a simple plot on an x and y axis of new distances), then it becomes easier to visualise which people are close to each other in these two dimensions than in the space in which they are floating.

In this study the similarity of SVS values as measured by their correlation in the data were analysed using MDS. It was expected that the MDS representation would result in more similar values locating closer to each in the MDS plot. Schwartz has used MDS to demonstrate and validate his theory on values (Schwartz, 1992, 1994). A recent study has also used MDS to demonstrate Schwartz's values theory on a revised rating method for the SVS (Lee, Soutar, & Louviere, 2008). One advantage of MDS is that it can easily demonstrate continuous relationships among data elements (Young, 2013). This way, MDS lends itself easily to demonstrating Schwartz's values theory, as the theory suggests that values form a continuous system of correlations based on their motivational goals (Schwartz, 1992). Other common data reduction methods such as factor analysis may not be adequate in demonstrating Schwartz's values theory as they do not easily support continuous relationships among the values (Schwartz & Boehnke, 2004).

Following MDS analysis of SVS measures in this study, the MDS plot was reviewed to verify whether Schwartz's theoretical model of value interrelations Figure 2.1 - above) was reproducible in a sample of healthcare students and professionals.

3.3.2.2 Construct validity – To what extent is the HPVS correlated with the SVS?

The construct validity of the HPVS was investigated by analysing correlations between the measured HPVS and SVS values. To compare 11 broad SVS values with the corresponding 11 HPVS values (Table 3.1 - above), the SVS items were aggregated into 11 broad values by taking the average rating of items in SVS subscales representing each Schwartz broad value (Schwartz, 1992) (see Appendix D). Spearman non-parametric correlation analysis between HPVS and broad SVS values was then performed, and a heatmap was used to analyse the correlation patterns between the two instruments. A heatmap is a graph which represents data values in table as colours whose intensity is proportional to the magnitude of the values being represented (Gehlenborg & Wong, 2012).

In the heatmap analysis, a colour grading of deepening green was used for increasing positive correlations, and deepening red for increasing negative correlations. It was expected that correlations between corresponding HPVS and SVS values, in the diagonal of the correlation matrix, would show stronger positive correlations (deeper green) than other parts of the matrix; and correlations between HPVS and SVS values sharing a similar motivation would appear as positive correlations (varying green), whilst those of HPVS and SVS values having opposing motivations would show as negative correlations (varying red).

3.3.2.3 Construct validity – To what extent is the structure of value interrelations within the HPVS correlated with the structure of value interrelations within the SVS?

Construct validity of the HPVS was further investigated by comparing value interrelations within the HPVS to value interrelations within the SVS. For example, the correlations between HPVS value pairs, authority and capability, and pleasure and critical thinking were

compared to corresponding correlations in SVS, power and achievement, and hedonism and self-direction, respectively. This investigation verified whether HPVS values related to each other in a similar manner as corresponding SVS values.

Pairwise Spearman non-parametric correlations for HPVS values, and pairwise Pearson product-moment correlations for corresponding SVS values were performed to compare the structure of value interrelations within the two instruments. The relationship between the two sets of correlations was explored using a scatter-plot. Finally, to estimate the correlation between the structure of value interrelations within the HPVS and SVS, a Pearson product-moment correlation coefficient between the two sets of correlations was computed (see Appendix E for an example of the data analysed). Bootstrapping with 2000 replications was then performed to estimate the expected value and confidence interval of this correlation coefficient. Correlation between correlations is often investigated in biology and psychology (Elston, 1975; Steiger, 1980); and bootstrapping is a technique used to estimate the accuracy of a statistical measure from a population (Wood, 2004). The commonly used bootstrapping approach recreates many random samples from the original sample, which are the same size as the original sample, and then estimates the statistic of interest and its confidence interval from the random samples produced instead of just the original sample (Campbell, 2006).

3.4 Results

3.4.1 Survey participants

A total 106 persons participated in the study survey. Eleven were excluded from the analysis because their rating pattern in the SVS indicated poor effort by them to differentiate their

values (Schwartz, 1992). Analysis was carried out on a final sample of 95 persons - 42 (44.2%) were students and 53 (55.8%) were healthcare professionals; 69 (72.6%) were medical students or medical doctors, 5 (5.3%) were nurses, 2 (2.1%) were pharmacists, and 19 (20.0%) were allied health students and professionals (Table 3.2 - below). Allied health participants included students and professionals from optometry, audiology, physiotherapy, occupational therapy, speech therapy and clinical psychology. Of all participants, 71 (74.3%) were female; 39 (41.1%) were aged 18 to 29 years old, 32 (33.7%) 30 to 49 years and 24 (25.3%) 50 years and over (Table 3.2). The total number of students and professionals that were reached by e-mail is not known because all e-mails were sent via individual department arrangements, and the candidate had no direct involvement with the recruitment of participants as required by the university ethics guidelines on anonymous e-mail surveys. Again, the survey link in the e-mails could be forwarded to other possible participants, and the extent of this forwarding activity was unknown.

Table 3.2 Participants

Profession / Demographic	Students	Healthcare Professionals	Total	% Participants
Medicine	32	37	69	72.6%
Nursing		5	5	5.3%
Pharmacy		2	2	2.1%
Allied Health	10	9	19	20.0%
Total Students / Professionals	**42**	**53**	**95**	100%
% Total Students / Professionals	**44.2%**	**55.8%**	**100%**	
Female	35	36	71	74.7%
Male	7	17	24	25.3%
18-29 years old	36	3	39	41.1%
30-49 years old	5	27	32	33.7%
50-64 years old	1	21	22	23.2%

3.4.2 Validity investigations

3.4.2.1 Content validity - Applicability of Schwartz's values model to healthcare practitioners.

First, ignoring spirituality, which Schwartz (1992) did not recognise consistently across cultures, SVS measurements in this study replicated Schwartz's theoretical structure with only a single deviation in which benevolence was located between tradition and conformity, instead of between universalism and tradition as expected (Figure 3.1). Thus, a single move was required to align our observed value structure to Schwartz's theoretical structure (Schwartz, 1992). Schwartz (1992) performed a median of 1.5 moves to align observed value structures from different cultures to his theoretical value structure. Considering the spirituality value, which was added to the SVS in this study, this value located between universalism and tradition (Figure 3.1) in agreement with Schwartz's findings in some of the samples he investigated (Schwartz, 1992).

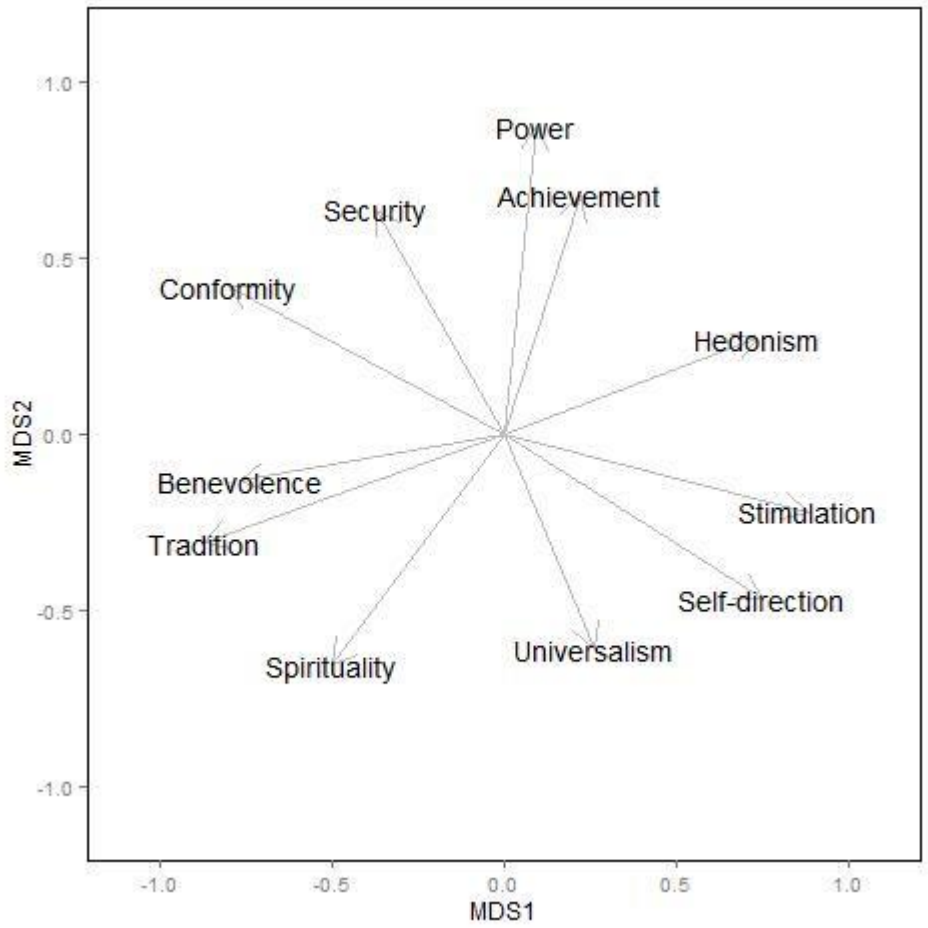


Figure 3.1 The structure of value interrelations from SVS measurements in the study sample using non-metric multi-dimensional scaling (MDS)

MDS1=first MDS coordinate, MDS2= second MDS coordinate

The SVS theoretical structure of value relations (Figure 2.1) was reproduced with a single deviation in a group of healthcare students and professionals in this study. In this deviation, benevolence located between tradition and conformity instead of between universalism and tradition as expected.

3.4.2.2 Construct validity - Correlation patterns between HPVS and SVS values

The correlations between HPVS and SVS values are presented in Table 3.3 and in a heatmap in Figure 3.2 below, and the heatmap patterns are summarised in Table 3.4 below. The correlations ranged from -0.39 (spirituality in the HPVS vs. hedonism in the SVS) to 0.64 (spirituality in HPVS vs. spirituality in the SVS).

Table 3.3 HPVS and SVS value correlations

	Power	**Achievement**	**Hedonism**	**Stimulation**	**Self - direction**	**Universalism**	**Benevolence**	**Spirituality**	**Tradition**	**Conformity**	**Security**
Authority	**0.28***	0.17	-0.06	-0.13	-0.08	-0.24*	-0.1	-0.14	-0.1	0.05	0.06
Capability	0.05	**-0.04**	0.05	-0.05	-0.03	-0.04	-0.21*	-0.17	-0.20#	-0.16	-0.1
Pleasure	0.24*	0.09	**0.42****	0.30*	0.12	0.09	-0.11	-0.25*	-0.30*	-0.16	-0.03
Intellectual - stimulation	0.18#	0.08	0.12	**0.15**	0.08	-0.06	0.03	-0.35*	-0.25*	-0.12	0
Critical thinking	0.11	-0.04	-0.01	-0.19#	**-0.04**	-0.28*	-0.09	-0.17	-0.08	-0.02	0.12
Equality	-0.12	-0.11	0.11	0.14	0.07	**0.19#**	0	-0.19#	-0.1	-0.15	-0.07
Altruism	-0.07	0.11	-0.15	0.1	0.04	0.16	**0.12**	0.05	-0.05	-0.06	-0.05
Spirituality	-0.29*	-0.12	-0.39**	-0.16	-0.17	0.02	0.24*	**0.64****	0.45**	0.15	-0.1
Morality	0	-0.01	-0.04	0.1	0.07	0.1	-0.01	0.14	**0.15**	0.12	-0.05
Professionalism	-0.04	-0.07	0.03	-0.11	0.03	-0.20#	-0.06	-0.07	0.09	**0.05**	0.16
Safety	-0.1	0.01	0.18#	0.01	0	0.01	0.09	-0.04	0.04	0.11	**0.08**

(# $0.05 < p < 0.1$; * $p < 0.05$; ** $p < 0.01$)

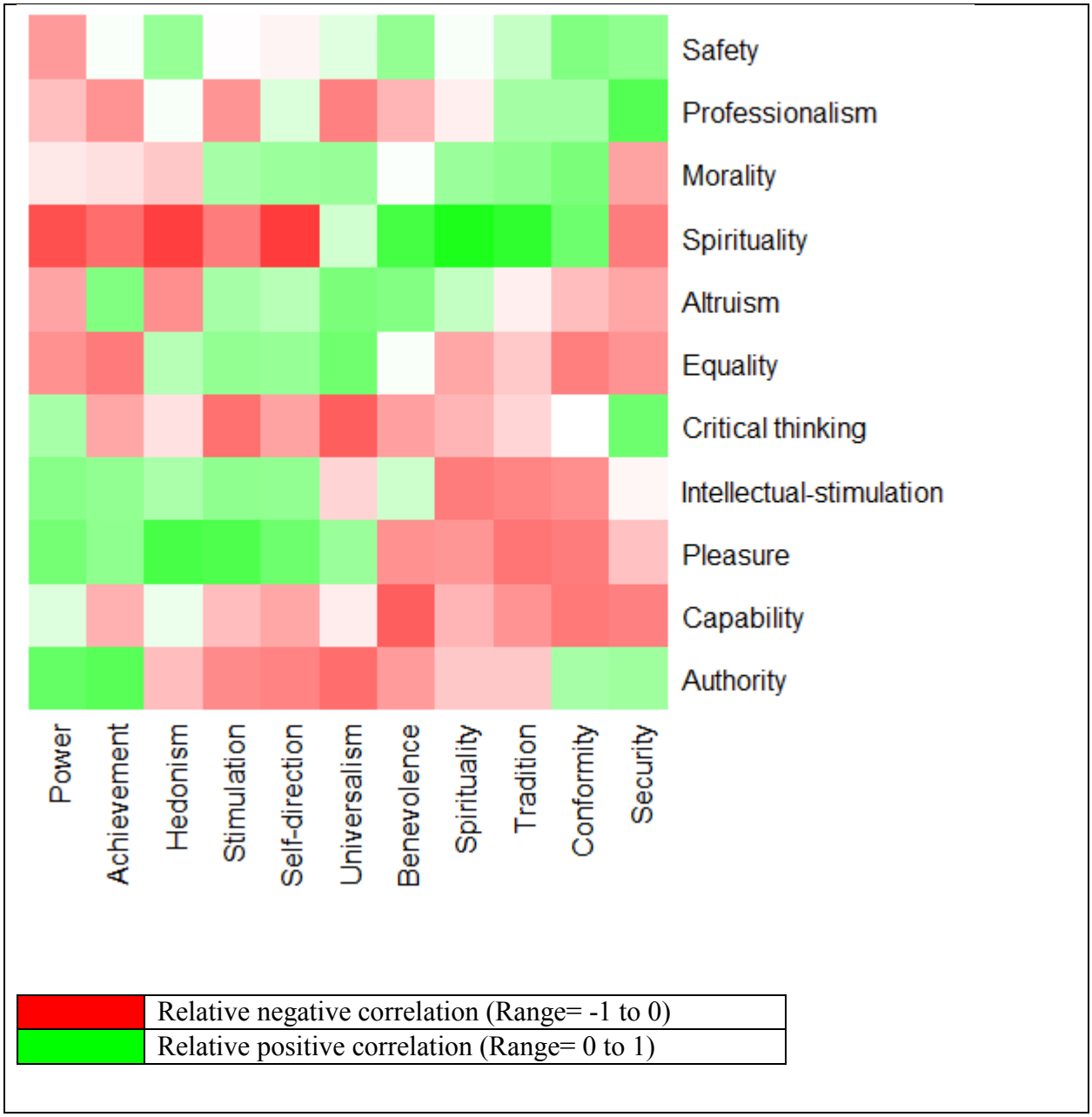


Figure 3.2 Correlations between SVS (x-axis) and HPVS (y-axis) items

SVS values in the x-axis are arranged in order of the theoretical structure of values, and the HPVS values in the y-axis are arranged in matching order to this. The diagonal block represents correlations between corresponding SVS and HPVS values. Deepening greens show greater positive correlations, and deepening reds show greater negative correlations.

Table 3.4 Summary of heatmap (Figure 3.2) correlations between SVS and HPVS values

Schwartz's values model as framework	Correlations – SVS vs. HPVS	
	Heatmap diagonal and adjacent regions	Heatmap off-diagonal regions
Expected pattern	Relative stronger positive correlations between corresponding SVS and HPVS values in the diagonal of the heatmap, and between corresponding SVS and HPVS values adjacent to the diagonal, which, in theory, share similar motivational goals.	Positive and negative correlations with values sharing similar motivational goals and values indicating opposing motivational goals, respectively. For example, it was expected that self-enhancement and openness-to-change values in the SVS (Figure 2.1) would show relative stronger positive correlations with HPVS values in similar motivational quadrants (Figure 2.4); and relatively stronger negative correlations with HPVS values in opposing quadrants self-transcendence and conservation.
Consistent with Schwartz's values model	i) The diagonal largely showed stronger positive correlations than the rest of the heatmap as we expected, except for achievement vs. capability and self-direction vs. critical thinking. The correlations ranged from -0.04 for achievement vs. capability and self-direction vs. critical thinking to 0.64 for spirituality (SVS) vs. spirituality (HPVS). ii) Most corresponding SVS and HPVS values adjacent to the diagonal also showed stronger positive correlations	i) Power in the SVS showed stronger positive correlations with pleasure, intellectual-stimulation and critical thinking; and stronger negative correlations with equality, altruism, spirituality and morality. ii) Hedonism showed stronger negative correlations with altruism, spirituality and morality. iii) Stimulation showed a stronger negative correlation with professionalism. iv) Universalism showed stronger positive correlations with

Schwartz's values model as framework	Correlations – SVS vs. HPVS	
	Heatmap diagonal and adjacent regions	Heatmap off-diagonal regions
	than the rest of the heatmap, as we expected. These included conformity vs. morality, spirituality (SVS) vs. morality, benevolence vs. spirituality (HPVS), tradition vs. spirituality (HPVS) , universalism vs. altruism, spirituality (SVS) vs. altruism, self-direction vs. equality, self-direction vs. intellectual-stimulation, hedonism vs. intellectual-stimulation, stimulation vs. pleasure, achievement vs. pleasure, achievement vs. authority, from the SVS and the HPVS, respectively.	spirituality and morality; and stronger negative correlations with authority and intellectual-stimulation. v) Benevolence showed stronger negative correlations with authority and intellectual-stimulation. vi) Spirituality showed stronger negative correlations with authority, capability, hedonism, intellectual-stimulation, critical thinking. vii) Tradition showed stronger negative correlations with capability, pleasure, intellectual-stimulation, critical thinking. vii) Conformity showed stronger positive correlations with authority and safety; and stronger negative correlations with capability, pleasure, and intellectual-stimulation. viii) Security showed stronger positive correlations with authority and professionalism.
NOT consistent with Schwartz's values model / Possible explanation within	i) Capability vs. achievement and critical thinking vs. self-direction in the diagonal showed a near zero negative correlation. ii) HPVS Critical thinking did not show expected	i) Power showed a stronger negative correlation with safety. ii) Achievement showed a stronger positive correlation with altruism. ii) Stimulation showed stronger positive correlations with

Schwartz's values model as framework	Correlations – SVS vs. HPVS	
	Heatmap diagonal and adjacent regions	Heatmap off-diagonal regions
healthcare practice contexts	correlations with other values around the diagonal of the heatmap.	altruism and morality; and stronger negative correlations with authority, capability and critical thinking. iii) Self-direction showed stronger positive correlations with morality and professionalism. iv) Benevolence showed a stronger negative correlation with professionalism. v) Tradition showed a stronger negative correlation with equality and altruism. vi) Conformity showed a stronger negative correlation with equality and altruism. vii) Security showed a stronger positive correlation with critical thinking; and stronger negative correlations with equality, altruism, spirituality and morality.
Exception within Schwartz's values model or healthcare practice contexts		i) Hedonism showed a stronger positive correlation with equality and safety. ii) Universalism showed a stronger positive correlation with pleasure. iii) Spirituality showed a stronger negative correlation with equality.

3.4.2.3 Construct validity - Correlation between HPVS and SVS structure of value interrelations

The relationship between corresponding value interrelations (measured as correlation coefficients) within the HPVS and the SVS is shown in a scatterplot – Figure 3.3 below. The following HPVS and SVS interrelation pairs were identified as outliers from the plot: correlation between professionalism and morality in HPVS vs. correlation between conformity and tradition in SVS; correlation between professionalism and altruism in HPVS vs. correlation between conformity and benevolence in SVS; and correlation between authority and critical thinking in HPVS vs. correlation between power and self-direction in SVS. The correlation between the HPVS and SVS structure of value interrelations was 0.36 ($p<0.0001$) before removing the outlier interrelation pairs, and the expected correlation from bootstrap analysis was 0.29 (CI 0.11 - 0.45); the correlation was 0.54 ($p<0.0001$) after removing the outlier interrelation pairs, and the expected correlation from bootstrap analysis was 0.43 (CI 0.29 - 0.57) - Table 3.5.

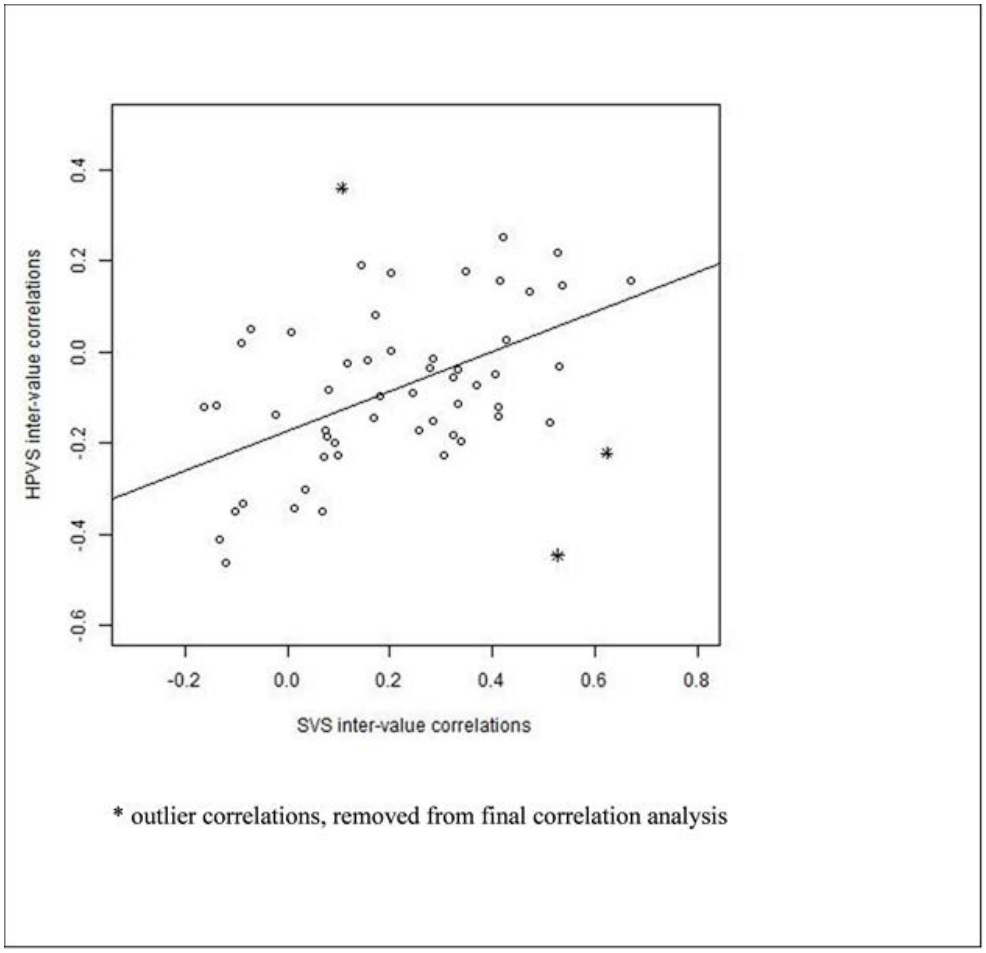


Figure 3.3 Relationship between value interrelations within the HPVS and SVS

There is evidence of a correlation between pairwise value correlations within the HPVS and corresponding pairwise value correlations within the SVS.

Table 3.5 Correlation of value interrelations within the SVS and HPVS

	Correlation of Correlations (value interrelations)			
Data	**Original Sample**	**Bootstrap Samples**		
		Replications	**Mean**	**Confidence interval**
All value pairs	0.36	2000	0.29	(0.11, 0.45)
All value pairs except outliers*	0.54	2000	0.43	(0.29, 0.57)

3.5 Discussion

This study investigated content and construct validity of an instrument for measuring healthcare practitioners' personal and professional values, the HPVS. The SVS was used as the reference instrument for evaluating the content and structure of the HPVS. MDS analysis of SVS measurements in the sample of healthcare students and professionals in this study replicated Schwartz's theoretical structure of value interrelations. This supports content validity of the HPVS by demonstrating that Schwartz's values model, from which the HPVS is derived, is applicable to healthcare practitioners as a group. Construct validity of the HPVS was further established through investigating its correlations with the SVS. Most correlations observed between HPVS and SVS values were either consistent with Schwartz's value model (Schwartz, 1992) or inconsistent with the model but interpretable within the healthcare practice context. These correlation patterns support evidence that the HPVS measures a similar construct to the SVS, and yet is more specific for measuring values in the healthcare practice context compared to the SVS. Further evidence that the HPVS measures a similar construct to the SVS was established by a significant correlation between the structure of value interrelations within the HPVS and the SVS. Overall, the HPVS and SVS exhibited similarities and differences; similarities because they share the same values theory, and differences because they measure values in different contexts – healthcare practice context for the HPVS and general life context for the SVS.

MDS results (Figure 3.1) demonstrated that healthcare practitioners' personal values are organised in a structure consistent with Schwartz's values model (Figure 2.1). A single deviation in the structure, as observed in our sample, is acceptable as good replication of the theoretical structure of value interrelations according to Schwartz's previous criteria

(Schwartz, 1992). Replicating the Schwartz structure of value interrelations in study validates Schwartz's values model as a suitable framework for organising a combined set of healthcare practitioners' personal and professional values (Moyo, Goodyear-Smith, Weller, Robb, et al., 2016). This provides some evidence of the content validity of the HPVS; derived from Schwartz's values model, the HPVS covers the full content of the value construct as defined by Schwartz (Schwartz, 1992).

Content validity of the HPVS established in this study adds to content validity evidence from an earlier study (Moyo, Goodyear-Smith, Weller, Robb, et al., 2016). The items for the HPVS were selected through consensus by research team of healthcare educators and practitioners (Moyo, Goodyear-Smith, Weller, Robb, et al., 2016). They were selected on the basis of their meaningfulness within the healthcare practice domain. This ensured that the HPVS content was readily recognisable within the specific context of healthcare practice, in contrast to corresponding items in the SVS that apply more to a general life context.

Evidence on the construct validity of the HPVS was established by exploring its correlations with the SVS. With a few exceptions, HPVS and SVS value correlations were either consistent with expectations within Schwartz's values model; or they were inconsistent with the model but could be explained within the healthcare practice context as in the following examples.

(1) SVS values that emphasise self-interests (achievement, stimulation, and self-direction) unexpectedly showed positive correlations with HPVS values that emphasise group and others' interests (altruism, equality, morality, professionalism).

A possible explanation for this is that healthcare practitioners' self-interest values in the general life context align with their patients' and professional group's interests and values in the healthcare practice context, because the practitioners are generally required to place patients' interests before their own (ABIM Foundation, 2002; Pellegrino, 2001), and also required to honour the shared goals, norms and values of their professional group (Frankel, 1989).

(2) HPVS capability and critical thinking values unexpectedly showed negative correlations with their corresponding SVS values, achievement and self-direction respectively. These observations are possible - in healthcare practice, capability and critical thinking promote both self and others' interests because of practitioners' primary motivation to serve patients (Rhodes, Morris, & Lazenby, 2011; Thayer-Bacon, 1993), whereas corresponding achievement and self-direction values in the general life context largely serve self-interests (Schwartz, 1992). Practitioners' motivations to enhance their abilities in the healthcare practice context may be different from their motivations to enhance their abilities in the general life context. Within the healthcare practice context, practitioners' motivations may be centred more around serving others (their patients) and not just serving themselves, whilst in general life contexts these motivations may be more inclined towards serving oneself.

There is a difference in meaning between self-direction defined as a value in the SVS in this study, and self-direction defined within the wider education literature. In the SVS context, self-direction is defined as a value whose primary motivation emphasises being independent to make one's own decisions and choose one's own goals (Schwartz, 1992). The SVS self-direction value primarily serves the interests of

the individual (Schwartz, 1992). However, in academic literature, self-direction is often discussed as an education process (Candy, 1991; Brockett & Hiemstra, 1991). In this context, self-direction is defined as a type of learning in which learners take the initiative in planning, administering and assessing their own learning (Candy, 1991).

Hence, in the separate contexts in which self-direction is considered it may agree or conflict with critical-thinking and safety values in the HPVS. In the earlier context, an experienced practitioner who values self-direction may exhibit high self-interest tendencies, which my disturb teamwork and endanger patient-safety. In which case SVS self-direction may conflict and HPVS critical thinking and safety values for this person as found in this study (Figure 3.2). However, in the later context a self-directed learner is likely to be a critical thinker (Kreber, 1998), and is likely to be knowledgeable on patient safety from self-learning activities (BMJ, 2016; Loma Linda University, 2016). In which case their self-direction as a personal attribute may be compatible with both HPVS critical-thinking and safety values; and their HPVS critical-thinking and safety values are also likely to be compatible – which would be in disagreement with the theoretical structure of the HPVS (Figure 2.4). But since at this stage, this structure was derived directly from Schwartz's theory (Schwartz, 1992), future empirical research on the structure of value relations in healthcare could seek to test and modify this structure as appropriate to fit the context of healthcare practice.

(3) Unexpectedly, SVS conformity was opposed to HPVS altruism and equality; similarly HPVS professionalism was opposed to SVS benevolence and universalism. These value conflicts are common within healthcare practice; the corresponding SVS and

HPVS values - conformity and professionalism - emphasise conservation of order and the status-quo (Schwartz, 1992), which are often challenged by healthcare practitioners as they advocate for patients' welfare and interests (Sellin, 1995) (i.e. emphasise their benevolence and equality values over conforming to institutional order).

Further evidence of the construct validity of the HPVS is supported by a significant correlation (0.43, CI= 0.26 - 0.57) between the structure of value interrelations within the HPVS and SVS (Table 3.5). In the reported correlation coeficient, outlier data points were removed (Figure 3.3). The outlier data points may also be explained in part by differences in how practitioners relate to certain values within the healthcare practice context compared to general life contexts (discussed above).

Overall, correlation studies of the HPVS and SVS support the construct validity of the HPVS; and support the interpretability of the HPVS both within the healthcare practice context and within the general human behaviour context. The positive correlations between the HPVS and SVS value were typically small to moderate, indicating the two scales measured related but distinct constructs. Some HPVS and SVS values that are theoretically similar or opposite in motivation did not show expected correlation patterns, which suggests that practitioners perceive values differently between their healthcare practice and personal life. Healthcare practitioners' values tend to align with altruistic service to patients, and identity with their professional group. The practitioners' values represent a specific set of values that are a product of specialised education, in which student practitioners learn values of their new profession and gradually align their own values to honour their responsibilities as members of

the profession (Ajjawi & Higgs, 2008; Clark, 1997). Also, it has been suggested that different groups in a population, such as the healthcare professions, tend to emphasise different values to support their purpose and interests (Fischer & Schwartz, 2011).

A few correlations involving SVS hedonism, HPVS pleasure and HPVS spirituality were difficult to explain. However, one suggestion is that it is possible that these values were reported relatively unreliably compared to other values because they pertain to relatively private and sensitive topics, which are generally prone to social desirability reporting bias in self-report surveys (Fisher, 1993); more so in this survey, given that it was conducted in a professional setting.

In this thesis, a structure of value relations in healthcare practice (Figure 2.4) was derived by organising healthcare practitioner values from literature within Schwartz values theory (Section 2.3.6). However, some value correlations between the corresponding SVS and HPVS values in this study revealed marked differences in the way the given values were conceived in the general life and healthcare practice contexts. Examples include the two SVS/HPVS pairs, self-direction and critical-thinking, and achievement and capability. Therefore, it is prudent for future research to test and improve the theory on the structure of values relations in healthcare (Figure 2.4) empirically. It is possible that some value conflicts as theorised in the current structure may be modified or nullified. For example is possible that in the HPVS structure (Fig 2.4), critical thinking and safety may not appear opposed, because critical thinking and safety in healthcare address interests or welfare the practitioners as well as those of patients (Thayer-Bacon, 1993; Shojania, et al.,2001; Younger, et al., 1992).

Again, it is possible that these conflicts may stand as theorised (Section 2.3.6), but may not apply in particular contexts.

3.5.1 Strengths and limitations

The HPVS was developed from values derived from multi-professional literature as an instrument to measure values across different professional groups. The literature from which the values were identified for the HPVS, was predominantly from nursing (64%) and 16% each from medicine and allied health professions (Moyo, Goodyear-Smith, Weller, Robb, et al., 2016). In contrast, this study established evidence of content and construct validity of the HPVS in participants who were predominantly medical practitioners (72.6 %), with 20% allied health professions and 5.3% nursing. There are two possible ways to view this.

Firstly, the above contrast can be viewed as a strength. It suggests that content of the HPVS is general enough to measure values in students and professionals across healthcare professions, and its construct is robust enough to be understood similarly across the professions. This implication supports the study's primary rationale for developing a multi-professional instrument for values in healthcare – that it is possible to identify a basic set of values that is recognised by all healthcare practitioners in guiding their decisions in clinical practice (Moyo, Goodyear-Smith, Weller, Robb, et al., 2016). This study identified these values, and conceptualised them in a general values theory to form an instrument, the HPVS, that is meaningful across healthcare professions. In this first view, the HPVS has great utility in supporting interprofessional learning and assessment on values.

Secondly, the contrast in professional representation in the literature reviewed to identify values (Moyo, Goodyear-Smith, Weller, Robb, et al., 2016) and the sample used to find evidence of validity of the HPVS could be viewed as a limitation. It could mean that the HPVS, although developed from a multi-professional perspective, has only shown evidence of validity in a predominantly medical profession cohort. In this second view, future studies will need to validate the HPVS separately in given healthcare professional groups before it is sanctioned as a multi-professional values instrument. This way, the HPVS can support values studies across healthcare professions and support assessment of values in interprofessional education and practice. Other future validation work on the HPVS may include investigating correlation of the HPVS with other variables such as work experience, decision-making skills and patient-centredness.

The HPVS adds significantly to theory on the study of values in healthcare, by integrating healthcare practitioners' personal and professional values within a validated theoretical framework, Schwartz's values model. This study established evidence that the HPVS retained the theory of Schwartz's values model, from which it was developed, and also characterised the healthcare practice context for which it was designed. Therefore, HPVS data can be interpreted within both human behaviour contexts using Schwartz's values model, and healthcare practice contexts employing its content that is familiarised to healthcare practice. Further, the HPVS provides a theoretical framework for interpreting practitioners' personal and professional values as a single system of related values. Studying values as an integrated system in which hypotheses on how the whole value system relates to other variables can be tested has been encouraged by some researchers (Schwartz, 2001; Wynia, Papadakis, Sullivan, & Hafferty, 2014). The HPVS can help researchers in healthcare understand how practitioners' values interact with each other as system of compatible and conflicting

priorities in clinical decision-making. Medical and healthcare profession educators can use such knowledge to develop teaching and assessment strategies on values that promote patient-centred decision-making in students.

Given the evidence on validity of the HPVS in a sample of predominantly medical practitioners, the HPVS can contribute to medical education and practice as a valuable formative assessment tool. The HPVS can help individual students and practitioners improve awareness of the personal and professional values that impact on their clinical decision-making. An individual value profile as shown in Figure 3.4 can highlight to students and practitioners which values they emphasise and which motivations dominate their value profiles. It is important for students and supervisors to note that there are no right or wrong value priorities when interpreting the plot. The plot is meant to help users reflect on their value priorities and consider possible biases associated with them, so they can moderate their decision-making approaches appropriately in given contexts. In the given profile (Figure 3.4), the particular individual is likely to prefer putting others first and maintaining the status quo (prioritising self-transcendence and conservation values, respectively), and less likely to be self-centred and open to change (less preference for self-enhancement and openness-to-change values, respectively). These value preferences are likely to influence the manner in which the individual student or practitioner makes decisions. Therefore, improving students' and practitioners' awareness of their value preferences can help them reflect better on their values and those of their patients to deliver more patient-centred decisions (Epstein, 1999).

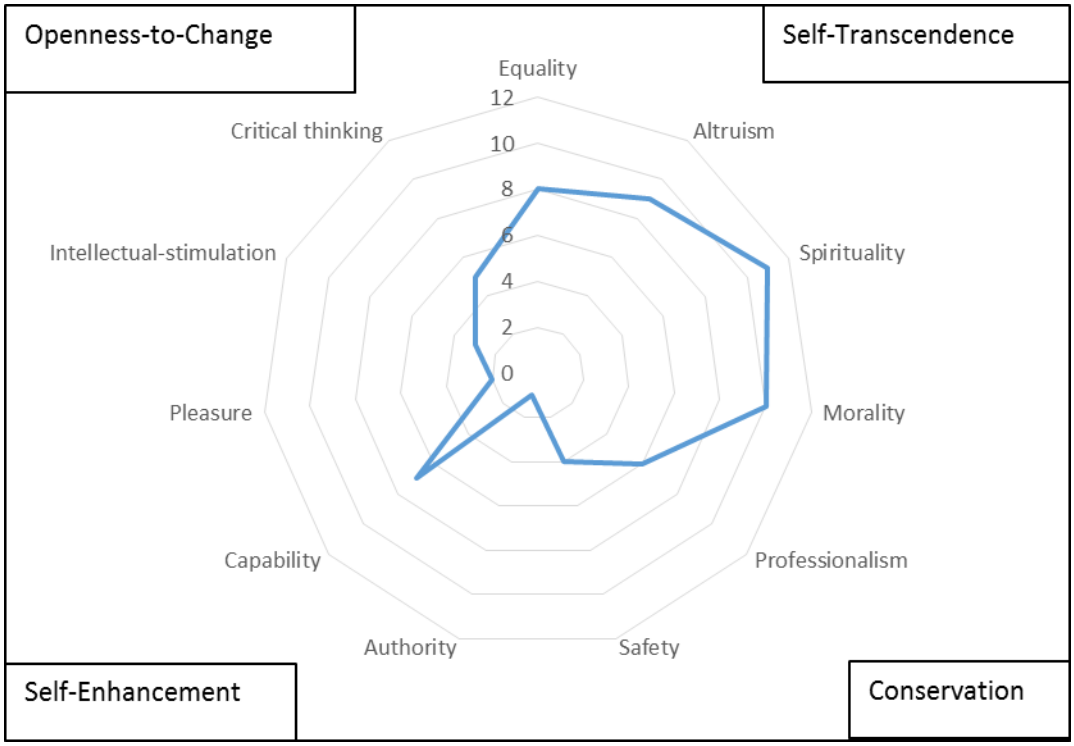


Figure 3.4 Individual value profile from HPVS

An individual value profile from HPVS showing a person who priorities spirituality first and authority last. The highest ranked value is scored 11 (spirituality=11) and the lowest ranked value is scored 1 (authority=1) in this graph. This person generally appears to prioritise self-transcendence and conservation values over self-enhancement and openness-to-change values. This plot was produced using the radar plot function in Microsoft Excel 2013.

With further validation in different professional groups, the HPVS can be useful in supporting improved interprofessional education and practice as a common instrument for measuring personal and professional values across different healthcare professional groups. It can be used to compare value priorities of different professional groups and to develop common strategies for values education across the groups. Finally, the HPVS can help practitioners understand the value priorities of other professional groups. Such improvements in interprofessional education and practice can contribute to better quality of patient care (Hall, 2005).

3.6 Conclusion

In conclusion, this study contributes evidence on the validity of the HPVS, which employs Schwartz's values model as a framework for measuring both practitioners' personal and professional values within the context of healthcare practice. The HPVS can support teaching and assessment of values in healthcare education, and can help individuals become more aware of their own values so they can improve the quality of their decision-making.

Chapter 4. Study three: Impact of values on medical students' decision-making

4.1 Chapter outline

This chapter reports a study to identify the impact of medical students' values on their clinical decisions (Moyo, Goodyear-Smith, Weller, & Shulruf, 2016a). The HPVS was used to measure students' values, and students' decision-making was measured used content analysis of decisions made on four given clinical scenarios.

4.2 Introduction

4.2.1 Background

Decision-making is generally influenced by a variety of factors such as individuals' experiences, skills, values, habits, personal perceptions of situations, and availability of information and time (J. S. B. Evans, 2003; Kahneman, 2002). Various studies indicate that clinical decision-making is significantly influenced by personal and professional values of healthcare practitioners in some clinical contexts (Gross & Robinson, 1987; Smith et al., 1991). This may result in personal biases in the clinical decisions made which can compromise the quality of patient care (Teal & Street, 2009). However, practitioners may not be aware of the biases that their values predispose them to in clinical decision-making. Little research has investigated the relationship between practitioners' values and decision-making (Helkama et al., 2003; McCabe et al., 1992). Reported research has largely focused on decision-making on general ethical dilemmas, not on decision situations typical in practitioner-patient interactions in everyday clinical practice.

There is need for constructive approaches to help practitioners reduce their personal biases in clinical decision-making. To reduce practitioner biases and facilitate patient involvement in decision-making, current practices promote patient-centred and shared decision-making models which incorporate the values, preferences and social circumstances of patients into clinical decisions (Committee on Quality Health Care in America, 2001; Deber, 1994b; O'Connor, Llewellyn-Thomas, & Flood, 2004). Some educators have also suggested that improving the practitioners' awareness of their own values and how these values influence their decision-making can help practitioners reduce their personal biases and deliver more patient-centred decisions (Duggan, Geller, Cooper, & Beach, 2006; Epstein, 1999).

To date, few studies have investigated how healthcare practitioners' values influence their decision-making (Altun, 2003; Helkama et al., 2003; McCabe et al., 1992). These studies have focused on the relations between values and specific skills in decision-making including: problem-solving in nursing students (Altun, 2003); ethical decision-making in medical and dental students (McCabe et al., 1992); and moral development in medical students (Helkama et al., 2003). One study (Altun, 2003) investigated students' decision-making abilities using an instrument that measured their confidence with problem-solving (Heppner & Petersen, 1982). Two other studies (Helkama et al., 2003; McCabe et al., 1992) measured decision-making abilities using case-based assessments with students selecting decision alternatives from a panel in which some alternatives were ethically correct or preferable to others. In these studies the case scenarios used were general ethical dilemmas, which were not specific to decision-making in typical everyday practitioner–patient interactions in healthcare.

Nevertheless, findings from these studies on healthcare students (Altun, 2003; Helkama et al., 2003; McCabe et al., 1992), and studies on other students (Feather, 1988; Helkama, 1983; Pohjanheimo, 1988) indicate some associations between values and decision-making. In one study (Altun, 2003), nursing students who prioritised values of truth and human dignity, as defined by the American Association of Nursing Colleges (American Association of Colleges of Nursing, 1986), showed greater confidence in problem–solving skills than other students. In another study (McCabe et al., 1992), medical and dental students who prioritised the value of comfort over the value of equality, as measured by the Rokeach Values Survey (Rokeach, 1973), showed poorer ethical decision-making abilities than other students. In a different study, medical students who priortised the value of universalism as measured by the Schwartz Values Survey (Schwartz, 1992), showed greater moral decision-making abilities than other students, whilst students who prioritised values of power and achievement in the same survey showed poorer moral decision-making abilities than other students (Helkama et al., 2003).

In contrast to the general ethical dilemmas used in the mentioned studies (Helkama et al., 2003; McCabe et al., 1992), decision-making in everyday clinical practice often involves cases where there is no clear consesus on which decisions are right or wrong, or best for the patient (Forman & Ladd, 1989; Logan & Scott, 1996). Clinical decisions often involve consideration of many factors including the clinical problem, investigation data, patient's values, patient's family and social circumstances, practice environment, organisation and legislation environments, and practitioners' capabilities and values (Gartner, Harmatz, Hohmann, Larson, & Gartner, 1990; Smith, Higgs, & Ellis, 2008). Sucessfully negotiating these various factors to arrive at decisions that have optimum outcomes from the patient's perspective reflects the practioner's decision-making skills within the context of actual practice (Norman, 2005).

4.2.2 Aim of this study

The aim of this study was to identify how medical students' professional values influence their decision-making with patients in typical everyday situations in general practice. Rather than use a multiple choice testing with given right and wrong alternatives to measure students' decision-making, as in some previous studies (Helkama et al., 2003; McCabe et al., 1992), this study sought to identify the factors different students considered in decision-making in different clinical contexts, and investigate how these factors are influenced by the students' values using the HPVS.

This study specifically aimed to identify how students' values impacted on their clinical decision-making by answering the following questions:

1) What factors are commonly considered by medical students in clinical decision-making in different clinical contexts?
2) How do differences in value priorities between medical students influence their decision-making in given clinical contexts?
3) Which values are likely to influence the type of factors that medical students consider in making decisions in different clinical contexts?

4.3 Methods

4.3.1 Participants and Measures

Year 5 students of a 6 year medical course were invited to take part in a survey on values and decision-making. Though desirable to collect, demographic data from the students was not collected. This was decided upon to improve the response rate: firstly, by keeping the survey

short; and secondly, by not asking respondents for sensitive information such as their age and religion that could have discouraged participation.

The study was approved by the University Ethics Committee (Reference 011073/2014). The survey was in two parts.

Part One: *Healthcare Practitioner Values Scale (HPVS).* In this study, participants were asked to rank the 11 values in the HPVS according to the importance of each value to them as a guiding principle in their healthcare practice, giving the value most important to them a rank of 1 and the value of least importance a rank of 11. A list of the 11 values with a margin for writing rank positions was preceded by a statement which read: "Importance to me as guiding principle in my clinical / health practice".

Part Two: *Clinical Decision-making*. Participants were asked to list issues and considerations that would matter to them and their patient in coming to a clinical decision in each of four clinical scenarios given below. The clinical scenarios were built using input from six General Practitioners working at the University of Auckland. The scenarios were selected to represent typical General Practice contexts where the decisions required were *not* about right or wrong judgements. This was in line with the scope of this thesis of excluding decisions about ethical issues (see 1.3 Delimitations). Each scenario had a number of potential clinical management options, with debatable harms and benefits, so that students could deliberate widely on issues around the scenario. In this regard, students with different value priorities were expected to show varying preferences for different management options.

The scenarios were also selected to cover issues that involved a range of different values in the HPVS.

In the survey, a worked example and the following instruction for completing this section of the survey were given:

“For each of the following four scenarios please list as many things as you think may be relevant (e.g. in bullet point form) about the issues and considerations that would matter to you and your patient in coming to a clinical decision”.

Clinical Scenario 1: PSA screening case

George is 59 year old European male married with four children. He works as a bus driver. He is generally well. His wife has suggested he has a PSA test for prostate cancer screening. He has no family history of symptoms.

Clinical Scenario 2: Roaccutane treatment case

Jane is a 14 year old girl with severe facial acne. She gives a history of not being sexually active. She is requesting Roaccutane, which has worked well for her friend.

Clinical Scenario 3: End-of-life management case

Raja is an obese 75 year old immigrant from India. He has had Type Two Diabetes for the last 15 years and two myocardial infarctions in the past six months, one recently. He has just been discharged from hospital and is aware that another event may be fatal. He is on appropriate medication but still suffers from angina and shortness of breath. Clinically he is not suitable for any surgical treatment. He is asking you about possible future management and wants to discuss various circumstances and care for this last stage of his life.

Clinical Scenario 4: Botox procedure case

Sarah is a 40 year European patient, married with a grown-up daughter. She owns a successful fashion boutique. She has developed crow's feet at the edges of her eyes and some wrinkling under her mouth. She requests that you treat her with Botox. You have not previously provided this form of treatment but she is the sixth person with this request in the last three months.

4.3.2 Data analysis

4.3.2.1 Content analysis of clinical decision-making: What factors are commonly considered by medical students in clinical decision-making?

A general inductive approach for thematic analysis of qualitative data (Thomas, 2006) was used to identify the factors students considered in making a decision for each clinical scenario. For each clinical scenario, the text from all participants was read over a number of times and key factors that the participants indicated as important in making their decision with the patient were extracted. Similar factors were merged into single factors iteratively until consistent and coherent factors were achieved for each clinical scenario. The factors identified in all the four clinical scenarios were then grouped into broader themes common to all the scenarios. Each participant was then scored with a "1" in each broad theme if they had at least one factor belonging to the particular theme, and scored with a "0" if they did not identify a factor in that theme. These scores were used as a measure of the students' decision-making. To validate the coding process, one member of the supervision team was given the themes and their description together with a sample of text segments which were not labelled with themes. The member was required to organise the texts into the best fitting themes. This member's classification of the texts into the given themes was compared to the initial coding of the texts to get an inter-rater agreement score.

4.3.2.2 Analysis of differences in value priorities between students who selected different factors in their clinical decision-making: How do differences in value priorities between medical students influence their decision-making in given clinical contexts?

For each clinical scenario, value priorities (measured by ranking) for participants who identified a particular factor in making their decision were compared with those of participants who did not identify the same factor. Welsh's t-test was used to evaluate differences between mean value priorities, and Cohen's d was used to estimate the effect size of the differences. Welsh's t-test is a variation of student's t-test which is more reliable when samples compared have unequal variances and sizes. The null hypothesis investigated in this analysis was that there were no differences in the mean value priorities of participants who considered a particular factor in making a clinical decision in a given scenario, and those who did not consider the same factor in the same scenario.

To highlight key differences in value priorities across factors in the four clinical scenarios, only the data with significant differences ($p<0.05$) and significant effect-sizes (Cohen's $d > 0.3$) was organised in a table (Table 4.2). The patterns in this table were analysed to understand how differences in values priorities between medical students influenced their choice of factors in given clinical contexts.

4.3.2.3 Analysis of variance components of differences in value priorities across factors and clinical scenarios for each value using random effects models: Which values are likely to influence the type of factors students consider in making decisions in different clinical contexts?

For all clinical scenario and factor combinations, differences in value priorities between students who considered a given factor in their decision and those who did not consider the same factor were computed - Table 4.3. For example, 24 data points for the value of altruism

consisted of differences in altruism ranks between students who considered patient perspective and those who did not consider the factor in each of the four clinical scenarios, differences in altruism ranks between students who considered family and social circumstances and those who did not consider this factor in each of the four clinical scenarios, and so on for each decision factor in the four scenarios. Similar differences were computed for each value in turn.

Variations in value priority differences (rank differences) for each value were explored using boxplots. If given values showed larger variation in rank differences across factors and scenarios, this would indicate that these values were more likely to influence the factors students considered in decision-making in different contexts than other values. Rank differences for each value were then analysed using a random effects model. The rationale in this analysis was that there are many clinical scenarios (contexts) that can arise in clinical practice, and many factors that can be considered in a clinical scenario. Therefore the clinical scenarios and the factors were analysed as random observations from populations of clinical scenarios and factors, respectively. For each value, a random effects model was used to estimate variance components for the rank differences between students who considered a given factor in their decision and those who did not. For each value, the rank differences were modelled as a dependent variable against clinical scenarios and factors considered in decision-making which were modelled as random independent variables. The variance components estimated were the proportions of variation in rank differences that were explained by random clinical scenarios, random factors in decision-making, and random measurement error (residual error) for each value. The null hypothesis in the random effects models is that the variance in the model that is explained by the random variables is zero and all the variance is due to random measurement error (residual error) (Eberly College, 2016).

Therefore the expected proportions of variance explained would be zero for random variables and 100% for the residual error. If the proportion of variation explained by clinical scenarios or factors considered in decision-making was significantly different from zero for particular values, this would imply that the given values were likely to influence the choice of factors considered in decision-making in different clinical contexts. Random effects models are commonly used in psychology, econometrics, biometrics and meta-analysis studies (Pinheiro & Bates, 2006). An example of random effects model used to analyse battery life for different brands with brand type modelled as a random variable is given online (Eberly College, 2016).

4.4 Results

A total of 117 (48.8%) medical students out of class of 240 students participated in the survey.

4.4.1 Common factors considered in clinical decision-making

Using content analysis of the text on decision-making from all four clinical scenarios, six major factors which students considered in decision-making were identified: patient perspective, family and social circumstances, patient safety, symptoms and treatment efficacy, practitioner awareness, and service cost (Table 4.1). These were grouped into three categories by considering the aspects of clinical decision-making on which they focused, namely, patient-centred (patient perspective, family and social circumstances); clinical (patient safety, symptoms and treatment efficacy); and situational (practitioner awareness and service cost) (Table 4.1). Inter-rater agreement in organising a sample of the text segments into the six decision themes was 96.5%. .

Table 4.1 Factors considered by students in clinical decision-making

	Decision-Factor	Description	Examples
Patient-centred factors	Patient perspective	Patient perspective describes factors considered in making a decision that sought the patient's involvement in the decision, including supplying the patient with the relevant information to make decisions.	"patient concerns"; "patient values"; "patient autonomy"; "patient's wishes"; "what does the patient want?"; "respect for autonomy - does he want the test"; "his feeling about end-of-life"; "spirituality"; "concerns with appearance"
	Family and social circumstances	Family circumstances describe factors considered in the decision-making that sought to understand issues around family support for the patient as well as the family's concerns or wishes to be included in the decision-making.	"family situation"; "family's concerns"; "family's wishes"; "family involvement in the decisions"; "family support available"; "relationship with wife children"; "family understanding"; "what his family wants and desires for end-of-life care"

	Decision-Factor	Description	Examples
Clinical factors	Patient safety	Patient safety describes factors where students considered protection of patient from harms they knew were probable from their clinical knowledge. There did not explicitly weigh these harms against possible benefits. For example most students showed clinical knowledge on safety concerns with Roaccutane treatment in pregnancy, and safety concerns with Botox treatment in general.	"safety"; "patient safety"; "safety concerns"; "safety issues"; "offer patient contraceptives to avoid pregnancy whilst on roaccutane"; "implications of missing cancer"; "worried about roaccutane/ pregnancy would do a B-hcg before starting, (B-hcg is screen test for pregnancy)"; "Botox lacks safety"
	Symptoms and treatment efficacy	Symptoms and treatment efficacy describes factors where students considered evaluation of presenting symptoms, and evaluation of evidence from research on the risks versus benefits of interventions, or evaluation of research evidence on the performance of diagnostic tests	"symptoms"; "medical history"; "family history"; "risk vs. benefit"; "likelihood of benefit"; "validity of test"; "test accuracy"; "sensitivity /specificity of test" ; "other symptoms -development and puberty"; "menarche", "Eating habits"; "mood", "personal hygiene"; "false positive / false negative"; "accuracy of test"; "efficacy of roaccutane / best practice Re: acne"; "increasing medication dose vs., possibility of adverse effects"

	Decision-Factor	Description	Examples
Situational factors	Practitioner awareness	Practitioner awareness describes factors in which students considered their personal views and values around the case, and factors where the students showed awareness of the limitations of their knowledge and competency to provide a required service.	"my own views"; "my beliefs" ; "my opinion"; "my level of skill"; "my competence"; "my knowledge"; "need to learn new skills"; "my own beliefs to palliative care"; "my competence in using Botox"; "my lack of experience in Botox when there is an increasing need for it "; "my capabilities"; "interest in learning new skill"; "personal views on Botox"
	Service Cost	Service cost describes factors in which students considered cost of the service to the patient and to healthcare system.	"patient's income"; "cost of treatment"; "funding"; "fair usage of medical resources"; "cost of Botox"; "funding for treatment"

4.4.2 Comparison of value priorities between students who selected different factors in making clinical decisions

Significant value priority differences ($p<0.05$, Cohen's $d > 0.3$) between students who selected different factors in making clinical decisions are shown in Table 4.2 and summarised below.

i) In the End-of-life and Botox scenarios, students who ranked spirituality higher considered patient-centred factors more frequently than students who identified less strongly with the value (Table 4.2).

ii) In the PSA, Roaccutane treatment and End-of-life scenarios, students who ranked spirituality higher considered clinical factors less frequently than students who identified less strongly with the value (Table 4.2).

iii) In the Roaccutane treatment and Botox treatment scenarios, students who ranked critical thinking higher considered patient-centred factors less frequently than students who identified less strongly with the value (Table 4.2).

iv) In the Botox treatment, End-of-life and PSA scenarios, students who considered situational factors ranked capability, professionalism, and safety values higher, respectively, than students who did not consider situational factors (Table 4.2).

Table 4.2 Comparison of value priorities of students who chose different decision factors

	Decision factor	Clinical scenario	Altruism	Authority	Capability	Critical thinking	Equality	Intellectual-stimulation	Morality	Pleasure	Professionalism	Safety	Spirituality
Patient-centred factors	Patient Perspective	PSA											
		Roaccutane							↓				
		End-of-life											
		Botox				↓			↑				↑
	Family and social circumstances	PSA											
		Roaccutane				↓							
		End-of-life											↑
		Botox		↓									
Clinical factors	Patient safety	PSA											
		Roaccutane											↓
		End-of-life											
		Botox											
	Symptoms and treatment efficacy	PSA											↓
		Roaccutane											
		End-of-life											↓
		Botox											
Situational factors	Practitioner awareness	PSA											↓
		Roaccutane											
		End-of-life									↑		
		Botox											
	Service Cost	PSA										↑	
		Roaccutane											
		End-of-life		↓									
		Botox			↑								

Key

Students ***who considered*** the factor in the given clinical scenario ranked the indicated value ***higher*** than those ***who did not consider*** the factor (p-value <0.05 and Cohen's d > 0.3)

Students ***who considered*** the factor in the given clinical scenario ranked the indicated value ***lower*** than those ***who did not consider*** the factor (p-value <0.05 and Cohen's d > 0.3)

4.4.3 Analysis of variance components of differences in value priorities across factors and clinical scenarios for each value using random effects models

From the data from all the clinical scenarios (Table 4.3), spirituality and critical thinking showed the greatest variations in value priority differences (rank differences) between students who considered a given factor in their decision and those who did not consider the same factor (Figure 4.1). Value priority differences for altruism, authority, capability, equality and morality also showed considerably higher variation compared to those of intellectual-stimulation, pleasure, professionalism and safety (Figure 4.1). From variance component analysis, the total proportion of variance in value priority differences explained by random factors and clinical scenarios was highest for critical thinking (56.2%) and spirituality (25.2%) values Table 4.4 below. The variance components for each value are shown in Figure 4.2 below.

Table 4.3 Value rank differences - data table for random effects model analysis

Set	Condc*	Decf**	Altruism	Authority	Capability	Critical thinking	Equality	Intellectual-stimulation	Morality	Pleasure	Professionalism	Safety	Spirituality
1	1	1	-0.274	-0.355	0.833	0.734	0.141	-0.583	-0.485	-0.750	0.736	0.376	-0.335
2	2	1	0.833	-0.782	-0.847	-0.653	0.310	-0.236	1.903	1.454	-2.097	-1.634	1.787
3	3	1	-1.500	-0.868	-0.421	1.798	0.675	-0.096	-0.360	-0.912	0.430	2.140	-0.851
4	4	1	0.108	0.025	0.357	1.069	0.488	-0.229	-1.106	0.239	-0.080	0.029	-1.518
5	1	2	-0.774	0.422	0.071	0.495	-0.453	-0.083	0.018	-0.715	-0.105	0.229	0.940
6	2	2	0.827	0.426	-0.089	1.008	0.236	0.003	-0.626	-0.107	0.072	-0.831	-0.851
7	3	2	-0.235	0.557	0.296	0.990	0.401	0.322	-0.522	-0.130	-0.284	0.184	-1.533
8	4	2	-0.711	0.707	-0.047	0.606	-0.442	0.581	-0.418	-0.233	0.478	0.091	0.021
9	1	3	0.300	-0.160	0.234	-0.949	0.806	0.213	-0.379	-0.551	0.413	-0.660	0.696
10	2	3	0.469	0.415	-0.756	-0.677	-0.423	-0.400	0.245	0.104	0.101	-0.198	1.218
11	3	3	-0.198	-0.835	-0.260	-0.959	0.003	0.953	1.047	1.605	-0.091	-0.106	-1.195
12	4	3	0.910	-0.305	0.546	0.217	-0.129	-0.141	-0.483	-0.071	-0.505	-0.127	-1.224
13	1	4	0.944	-0.517	-0.810	-1.002	-0.276	-0.711	0.018	-0.380	0.316	-0.128	2.588
14	2	4	0.072	-0.590	0.130	0.080	0.363	0.682	-0.296	0.218	-0.043	-0.439	-0.242
15	3	4	-0.435	-0.534	-0.680	-0.385	-0.173	-0.158	0.745	-0.319	-0.116	0.108	1.888
16	4	4	0.596	-0.163	-0.270	-0.537	0.691	0.177	0.410	-0.294	-0.589	-0.067	0.652
17	1	5	1.108	-0.735	0.714	-0.873	0.220	-0.542	-0.492	-0.036	-1.293	-0.118	2.007
18	2	5	-0.842	-0.410	1.202	-0.223	-0.755	0.352	0.646	0.126	-0.155	0.045	-0.024
19	3	5	0.044	0.323	-0.237	0.067	0.582	0.350	-0.263	0.021	-1.303	-0.591	0.964
20	4	5	0.119	0.821	-0.682	0.322	-0.223	-0.303	0.408	-0.639	-0.735	-0.340	0.713
21	1	6	0.361	0.156	-0.387	-0.722	-0.819	0.566	0.604	0.658	-0.465	-1.250	1.256
22	2	6	0.343	-0.814	-0.096	-0.670	0.747	0.292	-0.071	0.535	-0.285	-1.138	1.119
23	3	6	0.859	0.823	-0.571	-0.445	0.921	-0.866	-0.312	0.203	0.463	-0.473	-0.648
24	4	6	0.120	-0.826	-0.964	-0.522	-0.014	-0.848	-0.457	-0.054	-0.359	-0.043	1.424

*Condc = clinical scenario: 1 - PSA, 2 - Raoccutane, 3 - End-of-Life, 4 - Botox

**Decf = decision factor: 1 - Patient perspective, 2 - Family and social circumstances, 3 - Patient safety, 4 - Symptoms and treatment efficacy, 5- Practitioner awareness, 6 - Service cost

The data are mean rank difference between students who considered a given factor in the given clinical scenario. For example, in Set 1, the mean rank difference for altruism between students who considered patient perspective in the PSA case and those who did not was -0.274.

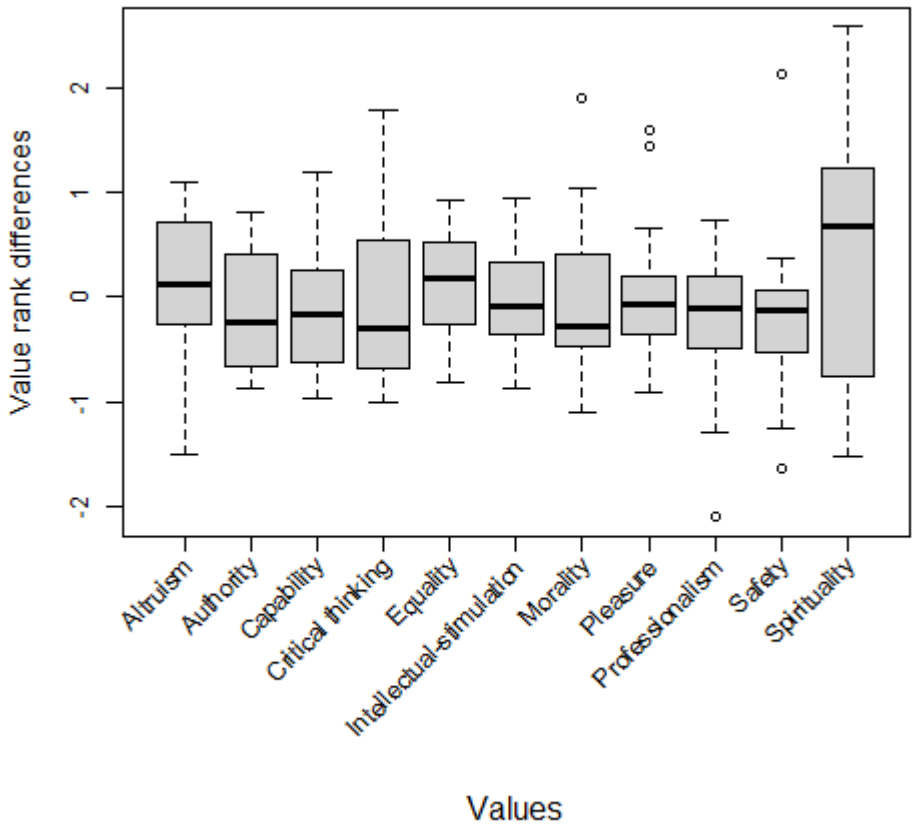


Figure 4.1 Value rank differences between students who considered a given decision factor and those who did not in each of the clinical scenarios

Spirituality and critical thinking showed the greatest variation in value rank differences between students who considered a given decision factor and those who did not consider the same factor. This figure uses the data from Table 4.3.

Table 4.4 Variance components of rank differences across clinical scenarios and factors for each value

Value*	Value differences summary statistics		Variance components (%)		
	Mean	Variance	Scenario	Factor	Residual
Spirituality	0.369	1.521	13.4	12.0	74.6
Critical thinking	-0.051	0.662	5.0	51.8	43.1
Safety	-0.206	0.514	14.0	0.0	86.0
Altruism	0.127	0.437	0.0	0.0	100.0
Morality	-0.009	0.433	0.0	0.0	100.0
Professionalism	-0.229	0.422	0.0	1.4	98.6
Pleasure	-0.001	0.382	8.9	0.0	91.4
Authority	-0.134	0.343	0.0	20.7	79.3
Capability	-0.114	0.33	0.0	0.0	100.0
Equality	0.12	0.249	0.0	0.0	100.0
Intellectual-stimulation	-0.029	0.241	0.0	0.0	100.0

* Values are ranked from the one with the highest total variance to the one with the lowest

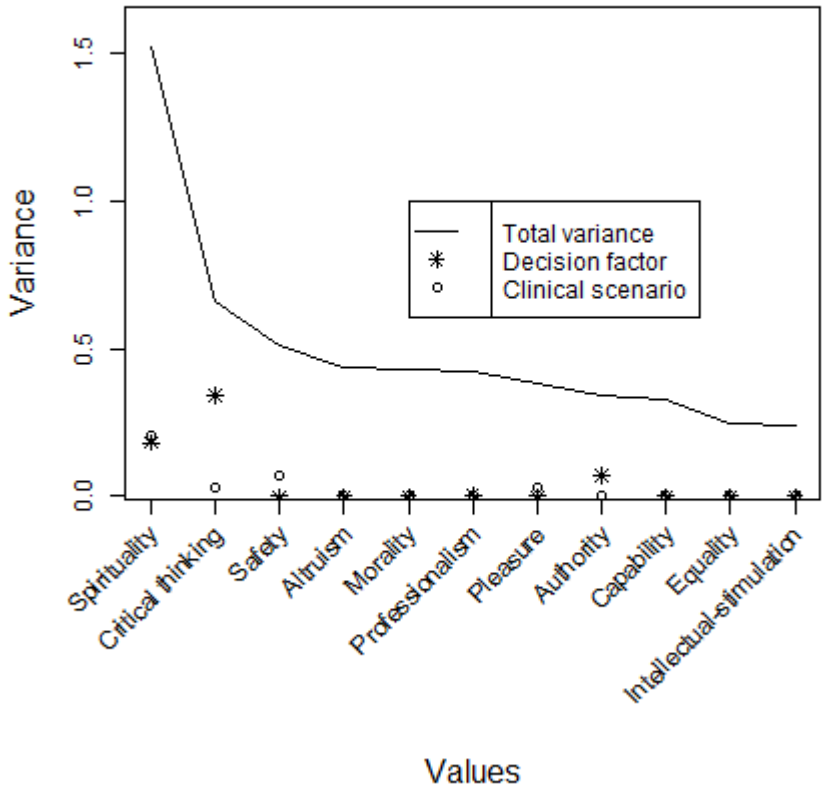


Figure 4.2 Variance components of rank differences across clinical scenarios and factors for each value

Spirituality and critical thinking showed the highest variance in the value rank differences across decision factors and scenarios. The two values also showed considerable proportion of variance explained by changing decision factors and clinical scenarios.

4.5 Discussion

The content analysis in this study identified six major factors that medical students consider in clinical decision-making and these were organised into three categories: patient-centred (patient perspective, family and social circumstances); clinical (patient safety, symptoms and treatment efficacy); and situational (practitioner self-awareness, service cost). Overall, findings in this study suggest that spirituality and critical thinking are the two values that are most likely to influence which of these factors medical students consider in their clinical decisions. Students who prioritise spirituality are more likely to consider patient-centred factors, and less likely to consider clinical factors than other students in some contexts. Whilst students who prioritise critical thinking are less likely to consider patient-centred factors in some contexts compared to other students. Additionally, results in this study suggest that students who prioritise capability, professionalism and safety values are more likely to consider situational factors relevant to a given case than other students.

The factors which influence clinical decision-making that were identified in this study are consistent with those discussed in the literature (Bakr, Sherif, Eid, & ELshal, 2013; Hagbaghery, Salsali, & Ahmadi, 2004; Smith et al., 2008). Results in this study add to this body of knowledge a new finding that patient-centred factors were the most prominent factors medical students considered in their decision-making. Patient–centred decision-making approaches have been widely promoted in medical education curricula in recent decades (Christianson, McBride, Vari, Olson, & Wilson, 2007; Laine & Davidoff, 1996; Markakis et al., 2000). Medical students may be picking up on this emphasis and adopting patient-centred decision-making approaches. This suggestion is supported by findings from other studies which indicate that medical students demonstrate considerable patient-centred

attitudes in their clinical practice (Haidet et al., 2002; Tsimtsiou et al., 2007; Wahlqvist, Gunnarsson, Dahlgren, & Nordgren, 2010).

Spirituality was the most prominent value associated with differences in students' decision-making approaches in this study. These findings on the impact of spirituality on clinical decision-making are consistent with other reports which indicate that a considerable number of practitioners acknowledge that their spirituality influences their clinical decisions (Catlin, Cadge, Ecklund, Gage, & Zollfrank, 2008; Curlin, Lantos, Roach, Sellergren, & Chin, 2005; Ecklund, Cadge, Gage, & Catlin, 2007; Ramondetta et al., 2011). Specifically, these findings indicate that students who prioritise spirituality favour patient-centred factors in decision-making. This is in agreement with one study which showed a positive correlation between spirituality and patient-centred approaches to decision-making (Pawlikowski, Sak, & Marczewski, 2012). Furthermore, findings in this study indicate that the influence of spirituality on clinical decision-making greatly depends on the clinical context. This is in agreement with findings from other studies (Monroe et al., 2003; Ramondetta et al., 2011; Voltmer, Büssing, Koenig, & Al Zaben, 2014). Practitioners were shown to be more willing to consider spirituality in contexts involving dying than in any other contexts (Monroe et al., 2003). Finally, findings in this study on the negative correlation between spirituality and evaluation of clinical factors in clinical decision-making are a concern. No related studies that look at this relationship were identified. Hence, results from this study suggest that this is a relationship that may require further investigation.

Critical thinking was the second most prominent value associated with differences in students' decision-making approaches after spirituality. In two scenarios in which patients

requested specific treatments, it was observed that students who ranked the critical thinking value high were less inclined to consider the patients' perspectives than students who prioritised the value less. This could imply that students who prioritise the critical thinking value may place less emphasis on patient-centred aspects of clinical decision-making than other students. The fact that critical thinking is generally associated more with analytic reasoning from evidence-based data (Facione & Facione, 1996; Facione, 1991) rather than decision-making guided by interpersonal interactions (Kahlke & White, 2013) may partly support this implication from our findings. Findings in this study suggest that students who value critical thinking may rely on the analysis of evidence-based data to make their clinical decisions but may overlook incorporating the patient's perspective into their decisions. However, no other studies on the relationship between critical thinking and patient-centeredness that could corroborate these findings were identified from literature.

Students who prioritised capability, professionalism and safety values were more inclined to consider situational factors (practitioner self-awareness, service cost) than students who prioritised these values less. However, these values did not appear to show a large variance across clinical scenarios and factors compared to spirituality and critical thinking (Figure 4.1 and Figure 4.2). Nevertheless, findings in this study suggest that students who prioritise these values tend to reflect more on their own values and competence and the cost of healthcare services than other students. This is likely to improve the quality of their decisions. Practitioners who are aware of their own values and limits of competency can reflect on these issues to enable them to consider all relevant information and perspectives in their clinical decisions (Epstein, 1999). Furthermore, practitioners have a significant responsibility in the management of healthcare resources, and their awareness of clinical costs can improve equitable distribution of healthcare resources (Fowkes, 1985).

Some significant differences in authority and morality value priorities were observed between students who considered different factors in their clinical decisions. This indicates that these values may influence students' decision-making approaches to some extent. However, no consistent patterns for these differences were drawn across the data in this study. Nevertheless, some literature suggests that practitioners' authority and morality values influence their clinical decisions (Tilburt et al., 2013). Finally, no meaningful differences were observed in value rankings for altruism, equality, intellectual-stimulation and pleasure between students who selected different factors in decision-making in the four clinical scenarios we investigated. These results suggest that these values do not appear to have a significant influence on the factors students consider in clinical decision-making. Altruism and equality values are strongly promoted as essential values for students and practitioners across healthcare professional groups, whilst intellectual-stimulation and pleasure are rarely recognised as relevant values in clinical practice (Moyo, Goodyear-Smith, Weller, Robb, et al., 2016). It is possible that because these values are either universally promoted or universally shunned in healthcare education, they hardly motivate different decision-making approaches in students. However, it is also possible that the decision-making scenarios we investigated did not address these values at all.

4.5.1 Strengths and limitations

This study had a number of strengths. Whilst previous studies relating healthcare students' values to decision-making have used general measures for values and/or decision-making (Altun, 2003; Helkama et al., 2003; McCabe et al., 1992), this study used a previously published value instrument specifically designed to measure personal and professional values relevant to decision-making in healthcare (Moyo, Goodyear-Smith, Weller, Robb, et al.,

2016; Moyo, Goodyear-Smith, et al., 2016b). This study also qualititavely coded text response data to specifically identify factors that students considered in decision-making with patients. A high level of agreement between two raters on the meaning of the factors identified was achieved. This supports the robustness of this qualitative approach for measuring clinical decision-making.

However, the number of scenarios and therefore the range of clinical contexts investigated in this study was small because this study focused on selected scenarios relevant to General Practice. This may limit the generalisation of findings in this study to other clinical contexts beyond the ones investigated in this study. Future work needs to extend the scope of the decision-making contexts beyond those in General Practice. The association between values and decision-making may yield different insights in other practice areas and clinical contexts. In particular, some values other than spirituality and critical thinking may be more significant in other clinical contexts as priorities and the nature of decisions may vary with practice areas. For example the nature of decision-making in emergency departments where response time is a critical factor may be different from that in other disciplines, and the values that significantly impact on decisions under emergency conditions may be different from values that significantly impact on decisions in other disciplines.

Another possible limitation regarding the clinical scenarios is that they were of different length. It is important in scenarios studies that the scenarios are uniform in length and detail to avoid participants making more effort with some scenarios than others (Evans, et al, 2015). However the scenarios were cases that students were reasonably familiar with from training and it was expected that their responses would capture their complete views on each scenario.

Another limitation of this study is that it focused on a single group of medical students in one school. The study may fail to account for possible cultural diversity in decision-making approaches, and this may limit the generalisation of the study's results to various cultures. Culture is known to impact on how different people make decisions (Bullock, 2011; Vitell, Nwachukwu, & Barnes, 1993; Weber & Hsee, 2000). To improve the generalisability of this study results on the impact of values on decision-making, multiple studies on values and decision-making can be carried out across multiple schools in different cultural settings. This way, the results may yield culture specific differences if there are any, or find results that are generalisable across different cultures.

4.5.2 Implications

Overall findings in this study suggest that medical students who prioritise values differently take different factors into account when making decisions about patient care. The students are more or less likely to consider or ignore some factors in decision-making in different contexts depending on their value priorities. This is congruent with decision theories which suggest that the choice of factors to consider in any given decision partly depends on the decision maker's personal characteristics and values (De Martino, Kumaran, Seymour, & Dolan, 2006; Tversky & Kahneman, 1981, 1986). Therefore, improving medical students' and practitioners' *awareness* of the influence of specific values on their clinical decisions can help them recognise and moderate their personal biases to consider all relevant factors in a given clinical situation. This way, they can make informed high quality decisions on patient care. Finally, educators can exploit the knowledge presented on explicit relations between values and factors in decision-making to enhance *teaching strategies* on clinical decision-making.

4.6 Conclusion

Spirituality and critical thinking are two prominent values that influence medical students' decisions on patient care. Their influence on clinical decision-making may show some conflict. Students who prioritise spirituality may emphasise patient-centred factors in their decisions whilst those who prioritise critical thinking may give less emphasis to the same factors.

Chapter 5. Discussion

5.1 Impact of values on clinical decision-making

Work in the previous chapter concluded that spirituality and critical thinking are the most prominent values that influence medical students' decision-making. This section discusses spirituality and critical thinking as concepts, and outlines key themes in the two concepts (Table 5.1 and Table 5.2), in order to explain the impact of spirituality and critical thinking values on clinical decision-making

5.1.1 Spirituality and clinical decision-making

In this thesis, students who prioritised spirituality as a value were more likely to consider patient-centred factors (including patient's values, views, and personal and family circumstances) in their decisions than other students (Table 4.2). However, these students were less likely to consider clinical factors (including evaluation of symptoms and evidence from research) in their decision-making than other students (Table 4.2). They were also less likely to consider situational factors (including healthcare costs, their personal values and views, and limitations of their knowledge) than other students.

Considering spirituality as a general concept (not as a value as defined in this thesis), there are no consensus definitions for spirituality. However, spirituality can be understood as a human experience in which individuals seek and express meaning and purpose in life through their beliefs and a sense of connectedness with themselves, others, nature and the sacred (Dyson, Cobb, & Forman, 1997; Puchalski et al., 2009; Puchalski, Lunsford, Harris, &

Miller, 2006). Spirituality is thought of as an individual's quest to find meaning and purpose in life beyond material things and everyday existence (Burkhardt, 1989). It is closely related to religion, however it is widely considered to be more private than religion (Burkhardt, 1989; McGhee & Grant, 2008). Whilst religion is thought of as an organised system of beliefs, traditions and rituals that are shared by social groups of people (Dyson et al., 1997; McKee & Chappel, 1992), spirituality is thought of as an individual pursuit of meaning that can occur without the institutional restrictions of organised religion (Burkhardt, 1989; Zinnbauer, Pargament, & Scott, 1999). However, most people who are religious are also spiritual (McGhee & Grant, 2008), and organised religion provides individuals opportunities to share and enhance their spirituality (Heelas, Woodhead, Seel, Tusting, & Szerszynski, 2005; McKee & Chappel, 1992).

Although there are no consensus definitions of spirituality, some researchers have established some common themes used to describe spirituality (Burkhardt, 1989; Dyson et al., 1997; McGhee, 2015; McGhee & Grant, 2008). These common themes include transcendence, meaning, interconnectedness and innerness or inner-harmony (Chiu, Emblen, Van Hofwegen, Sawatzky, & Meyerhoff, 2004; de Jager Meezenbroek et al., 2012; McGhee, 2015) - Table 5.1 below. These themes are consistent in many forms of spirituality practiced in different cultures (Chiu et al., 2004). The themes emphasise connectedness and harmony with one's inner-self, and connectedness and harmony within one's relationships with others, nature and the divine (Burkhardt, 1989; de Jager Meezenbroek et al., 2012; McGhee, 2015; McGhee & Grant, 2008). Connectedness is considered central to spirituality (Chiu et al., 2004; de Jager Meezenbroek et al., 2012; Dyson et al., 1997; Puchalski et al., 2006). Connectedness involves a sense of knowing oneself, and having loving and supporting relationships with friends and family, as well as a sense of closeness to the divine (Burkhardt, 1989).

Table 5.1 Key themes in spirituality

Theme	Description
Transcendence	Desire to be part of something bigger than oneself
Interconnectedness	Feeling connected with others, nature, the universe and the divine
Meaning	Finding an understanding of the world and one's purpose in it
Innerness / inner harmony	Looking inwards to find peace and harmony with oneself and the world

Adapted from (McGhee, 2015)

In recent decades in healthcare, there has been increased interest in the role of spirituality in clinical practice (Scheurich, 2003). Studies have shown that spirituality and religious beliefs have an impact on patient healing and wellbeing (Burgener, 1999; Cohen, Mount, Tomas, & Mount, 1996; Mann & Larimore, 2006). It has been reported that spirituality and religious beliefs help patients cope with suffering and stressful events (Burgener, 1999; Cohen et al., 1996; Mann & Larimore, 2006). Accordingly, some patients would prefer healthcare providers to incorporate their spiritual beliefs into their treatment plans (Ehman, Ott, Short, Ciampa, & Hansen-Flaschen, 1999). Furthermore, some researchers argue that providing spiritual care to patients improves the practitioner-patient relationship, and provides valuable support to the patients, which in turn facilitates the patients' healing (R. G. Evans, 2003; Puchalski, 2009; Puchalski et al., 2009).

Findings in this thesis suggest that students who prioritise spirituality tend to favour a patient-centred approach to decision-making. They were more likely to identify patient-centred factors in their clinical decisions than other students (Table 4.2). They therefore appear to identify more with the humanistic model of care than other students (Figure 5.1). This finding can partly be understood by acknowledging that the relationship-centred property of spirituality (developing harmonious relationships and developing connectedness with others) may provide students who prioritise spirituality with a stronger predisposition to identify and attend to patient-centred factors in clinical decisions than other students (Figure 5.1). Patient-centredness and humanistic care involve building connected relationships between the practitioner and the patient (Puchalski et al., 2009). Students who prioritise spirituality may find it easier to form such relationships and engage proactively with patients than other students because of the importance spirituality places on relationships. This explanation is consistent with a wide range of literature which suggests that integrating spirituality into

clinical practice improves practitioner-patient relationships, staff relationships, compassionate care and patient-centredness in the clinical encounter (Balboni et al., 2015; R. G. Evans, 2003; Morgan & Yoder, 2012; Puchalski, 2010; Puchalski et al., 2006).

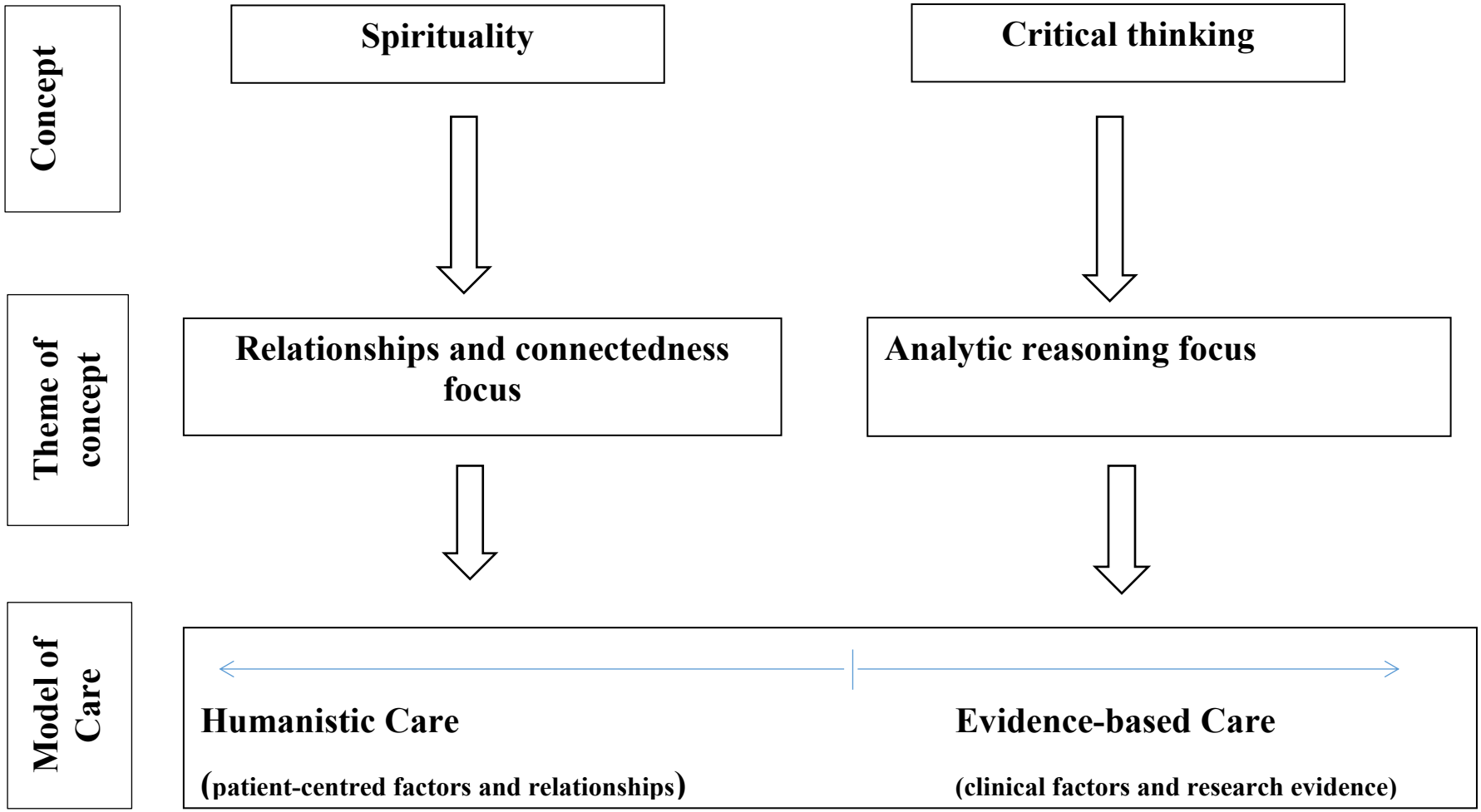


Figure 5.1 Relationship between spirituality, critical thinking and models of clinical care

Decision-making approaches fall into a spectrum from humanistic to evidence-based care. Humanistic care is supported by spirituality, which emphasises relationships, and evidence-based care is supported by critical thinking, which emphasises analytic reasoning.

Some literature also suggests that practitioners who integrate spirituality into their care are better able to communicate with patients, and better able to help patients deal with their suffering and achieve healing (Michael et al., 2006; Puchalski et al., 2006). For instance, a study investigating the impact of medical students' spirituality on their experience of the hidden curriculum showed that students who identified themselves as spiritual were better at maintaining harmonious relationships with other students and medical teams than those who identified as non-spiritual (Balboni et al., 2015). The students who identified themselves as spiritual were also reported to respond more constructively to patient suffering by building relations with patients that showed more compassion and hope to the patients; whilst students who were not spiritual tended to respond negatively by repressing their emotions (Balboni et al., 2015).

Overall, a humanistic model of decision-making in students who prioritise spirituality appears to be supported by the strong focus of spirituality on relationship harmony and connectedness (Figure 5.1). It is further supported by the fact that spiritual individuals are generally socialised to uphold values of compassion, human dignity, humility, selflessness and social fairness; values which help them build supportive relationships with patients (Balboni et al., 2015; Kinghorn, McEvoy, Michel, & Balboni, 2007).

Findings in this thesis also suggest that students who prioritise the spirituality value appear less inclined towards an evidence-based approach to decision-making than others students (Figure 5.1). They were less likely to consider clinical factors (including symptoms and evidence from research) in their decisions than other students (Table 4.2). This is consistent with the suggestion that these students tend to favour a humanistic model of care which emphasises relationships and caring over scientific evidence. The nature of spirituality itself

does not emphasise any analytic reasoning, which is an important part of evidence-based decision-making (Table 5.2). Nevertheless, because students who prioritise spirituality prefer a humanistic care approach, they are likely to focus more on the interaction in the practitioner-patient relationship than just focus on the presented disease. Thus, within a spectrum of possible clinical care models from humanistic care to evidence-based care, this probably represents a preferred decision-making approach, and not a deficiency (Figure 5.1).

This new knowledge on the influence of the spirituality value on clinical decision-making has important implications for medical education. Students who prioritise spirituality may have an advantage of being primed towards a patient-centred and humanistic approach to decision-making. Humanistic care is essential in modern clinical practice because it promotes patient involvement in their care through positive practitioner-patient relations, and promotes compassion, care and support for the patients in their time of suffering, and facilitates their healing (Greaves, 2002; Miles & Loughlin, 2011). Promoting this value in medical education may help develop practitioners who are better able to attend to patients' unique needs and provide humanistic care. But incorporating spirituality into clinical practice remains a contentious subject world over, although a considerable number American medical schools have made progress over the last decades to incorporate spirituality into medical education (Lucchetti, Lucchetti, & Puchalski, 2012; Puchalski, 2006). However, since there is other evidence that students who prioritise spirituality may be less inclined towards evidence-based decision-making than other students, helping these students become aware of such a possible bias in their decision-making can encourage them to continuously seek a better balance between humanistic care and evidence-based approaches to decision-making. In this way, they can improve the quality of their decision-making and the quality of patient care.

5.1.2 Critical thinking and clinical decision-making

Students who prioritise critical thinking were less likely to consider patient-centred factors in their decisions than other students (Table 4.2). This was in contrast to students who prioritised spirituality, who were more likely to consider these factors (Table 4.2).

As in the case of spirituality, there are numerous definitions of critical thinking. However, critical thinking is generally defined as a process of reflective reasoning that is focused on deciding what to believe or do in a given situation (Ennis, 1991). In 1990, a group of experts reached consensus on the definition and elements of critical thinking (American Philosophical Association, 1990), and defined critical thinking more broadly as purposeful judgement which involves interpretation, analysis and evaluation of methods, criteria and contexts upon which judgements are made. Similarly, other researchers describe critical thinking as thinking that is subjected to self-criticism and self-correction processes that question how one is making a judgement (Lipman, 1987; Simpson & Courtney, 2002). It is thinking that is directed towards some end such as solving a problem or making a decision (Bailin, Case, Coombs, & Daniels, 1999). Described in this way, critical thinking is therefore considered to be a broader concept than problem-solving and decision-making alone, and is considered principal in facilitating sound problem-solving and decision-making (Bailin et al., 1999; Duchscher, 1999; Ennis, 1991).

Table 5.2 Key themes in critical thinking

Theme	Description
Interpretation	Identifying and describing the problem or issue
Analysis	Examining ideas, assumptions, arguments and evidence
Inference	Drawing hypotheses and conjectures from the information and evidence available, and identifying alternative meanings from them
Evaluation	Accessing credibility of arguments and resulting conclusions
Explanation	Elaborating reasons for ones arguments and conclusions
Self-regulation	Re-examining one' own views and arguments and re-examining and correcting ones reasoning and conclusions if necessary
Background Knowledge	Having intimate knowledge of area in which critical thinking is being applied

Adapted (Facione, 1991)

Although there are varied conceptions of critical thinking, some researchers have established common themes used to describe critical thinking (American Philosophical Association, 1990; Bailin et al., 1999; Facione, 1991; Paul, 1992). The themes for critical thinking as summarised by Facione (1998) are presented in Table 5.2 above. Principal themes in critical thinking include: interpretation; analysis; inference; evaluation and explanation of evidence, methods and criteria upon which judgements are made; constant revision of, and regulation of one's thinking; as well as possession of sound knowledge in the subject matter on which judgement is sought (American Philosophical Association, 1990; Facione, 1991) - Table 5.2. These themes emphasise analytic reasoning skills and intimate knowledge of relevant subject matter (Bailin, 2002; Paul, 1992).

In modern healthcare, the complexity involved in problem-solving and decision-making often requires critical thinking skills to evaluate abundant data, information and evidence that is often available to practitioners when considering decisions around patient care (Simpson & Courtney, 2002). Good critical thinking skills can improve the quality of clinical decisions (Cruz, Pimenta, & Lunney, 2009; Fowler, 1998; Lunney, 2003; Shin, 1998). Consequently, most healthcare professions invest a considerable amount of time in teaching and training students in the skills of critical thinking (Fesler-Birch, 2005; Kahlke & White, 2013).

Findings from this thesis suggest that students who prioritise critical thinking appear less inclined towards a patient-centred approach to decision-making compared to other students. They were less likely to consider patient-centred factors (patient social circumstances and views) into their clinical decisions than other students (Table 4.2). It is noted though, that no significant relationship between consideration of clinical factors (and research evidence) and rankings for the critical thinking value was observed in this study. However, within the

spectrum of decision-making approaches, from humanistic care to evidence-based care, it is likely that students who prioritise critical thinking prefer a more evidence-based approach to decision-making than a humanistic one relative to students who prioritise spirituality (Figure 5.1). This is probable, because students who prioritised critical thinking considered patient-centred factors less often than other students, whilst those who prioritised spirituality considered the same factors more often than other students. This observation appears to position the two groups of students on polar ends of the spectrum regarding patient-centredness in decision-making (Figure 5.1).

The findings highlighted above, therefore, suggest that there is a possible conflict between spirituality and critical thinking values in the manner in which they influence decision-making in medical students. First, this can be explained in part by considering the theory on values that was established in this thesis (Chapter 2). The two values are in opposite motivational groups according to the values framework derived in this thesis (Figure 2.4). Spirituality is in a group of values that seek to preserve tradition and the status quo (conservation values), whilst critical thinking is in a group of values that embrace change and new ideas (openness-to-change). The facets of caring and healing relationships that are associated with spirituality are seen as part of the tradition of clinical practice (Puchalski, Blatt, Kogan, & Butler, 2014). Students who prioritise spirituality may identify more with this tradition of clinical practice (of caring and healing relationships) than students who prioritise critical thinking because the spirituality value tends to promote conservation of traditions. Similarly, students who prioritise critical thinking may identify more with new paradigms of care, such as evidence-based practice, than students who prioritise spirituality because the critical thinking value tends to embrace change and new ideas. Thus, because of

the opposite motivations underlying the two values, it is understandable that the values may influence students' decision-making approaches in a conflicting manner.

Second, the conflict between spirituality and critical thinking can be explained in part by the different emphases of the two concepts. This thesis has suggested that the relationship emphasis of spirituality supports students who prioritise spirituality to construct positive relationships with patients and develop a patient-centred approach to decision-making. Critical thinking emphasises analytic reasoning and, compared to spirituality, lacks a relationship focus (Table 5.1 and Table 5.2). Hence, conversely, students who prioritise critical thinking may be less supported to construct similar positive relationships with patients, and therefore may be less inclined to adopt a patient-centred approach to decision-making than those who prioritise spirituality (Figure 5.1).

However, since critical thinking emphasises advanced evaluation skills (Table 5.2), it appears to better support an evidence-based approach to decision making than spirituality. This is likely because the evidence-based approach requires similar advanced evaluation skills as in critical thinking in order to support scientifically informed decision-making (Haynes et al., 1997). Arguably, critical thinking skills are paramount to sound appraisal of research and clinical data in evidence-based practice (Profetto-McGrath, 2005). Therefore, in the spectrum of decision making approaches from humanistic care to evidence-based care, students who prioritise critical thinking may be more inclined to an evidence-based approach to decision-making, and less inclined to a humanistic one, than students who prioritise spirituality (Figure 5.1).

In essence, the contrast in motivation between the values of spirituality and critical thinking, and the contrast in themes between spirituality and critical thinking as concepts, suggest why decision-making approaches of students who prioritise spirituality or critical thinking may appear to conflict (Table 4.2 and Figure 5.1). However, there is no basis on which to suggest which value priority between the two is ideal for optimum clinical decision-making. Furthermore, students' decision-making approaches may not necessarily fall into a clear-cut dichotomy between humanistic and evidence-based care, which are strongly supported by spirituality and critical thinking, respectively. Instead, students' decision-making approaches are more likely to represent a continuous spectrum between these two models of clinical care. Practically, this means that students' decision-making preferences may fall anywhere within a range from pure humanistic care (focusing solely on care, empathy and healing relationships) to evidence-based care (focusing solely on clinical and research evidence), and these preferences are likely to be associated with the relative priority the students place on spirituality and critical thinking values (Figure 5.1).

However, it is important to note that there would be exceptions to the possible relationship between spirituality and critical thinking in their roles in clinical decision-making for two key reasons. First, because values may be context specific - not all values that are important to a person will be relevant to all contexts (Schwartz, 1992). Only values relevant to a particular context may come to the fore in that context. Some clinical practice contexts are well-formed on the demands that they place on practitioners, hence practitioners are likely to prioritise particular values in particular departments; and some values may not be so relevant in those departments at all. Second, people can, and do, pursue competing values but usually do so in separate acts, contexts, and times (Schwartz, 2012). For example, it is likely that a practitioner in palliative care may emphasise their spirituality and empathy values to enhance

their humanistic care approach in that department. The same practitioner may emphasize critical thinking and capability values to enhance their evidence-based care approach in an emergency department were such skills are demanded. And it is possible that the spirituality value and humanistic care may be less applicable in an emergency department because of limited time and opportunity to grow connected relationships with patients.

Nevertheless, general theoretical relationships among values exist where some values may not be compatible in the same act or context (Schwartz, 1992). Therefore, practitioners, depending on their personal preferences, will have to prioritise those values in some acts. For instance one cannot desire to be independent and uphold tradition in the same act as the two values have opposing motivations (Schwartz, 2012). Similarly in clinical practice one could not seek to be have power over a patient and be equal with them in the same act. These general value relationships help researchers hypothesise the possible consequences of prioritising some values over others in contexts where a number of values are relevant (Schwartz, 2012). And in healthcare research, a tool like the HPVS can help researchers formulate such hypotheses on value relations (Moyo et al, 2016b).

In summary, this thesis contributes the novel knowledge that students' values may influence their decision-making approaches resulting in possible biases in their clinical decisions. Findings on the possible conflict between spirituality and critical thinking values in clinical decision-making have important implications for medical education and clinical practice. In medical education, it is imperative to deliver medical curricula which improve students' awareness of their own values so they can guard against personal biases in decision-making. Therefore, it may be valuable for educators to draw students' attention to key values, such as spirituality and critical thinking, which may significantly bias them towards predominantly

humanistic or evidence-based approaches to decision-making. Students who prioritise spirituality or critical thinking may be at risk of being at the extreme ends of the decision-making spectrum from humanistic to evidence-based care. Therefore the students need to be aware of their values and biases associated with specific values to help them safeguard against ignoring other relevant factors in their clinical decisions because of such biases.

Delivering healthcare that is supported by evidence and is in the best interests of the patient requires a balance between humanistic and evidence-based approaches to clinical decision-making (Panda, 2006). Disproportionate emphasis on any model of care can lead to suboptimal decision-making (Miles, 2012). Hence, a balanced approach to decision-making is suggested (Miles, 2012; Panda, 2006). Such an approach can ensure that students and practitioners who prioritise spirituality or critical thinking can adequately balance humanistic care and evidence-based care to make high quality decisions that are in the best interests of the patients despite their value priorities. There is a need for practitioners who can employ both decision making approaches together – this way, they can adequately translate their critical appraisal of science evidence into choices that are presented to patients within compassionate and caring practitioner-patient relationships to deliver care that is holistic and supportive of patient healing (Panda, 2006, Post, 2011).

5.2 Significance and contributions of this thesis

5.2.1 A new instrument to measure healthcare practitioners' values

This thesis makes significant contributions to education and practice in healthcare. This thesis adds a new tool to the methodology for measuring personal and professional values in healthcare, the HPVS. The HPVS is a comprehensive instrument that measures key personal

and professional values that are relevant to decision-making in everyday practice contexts across healthcare professions. The HPVS is supported by theory on human behaviour derived from Schwartz's values model (Schwartz, 1992), and is also contextualised to measure values within the context of healthcare practice. Consequently, measures from the HPVS data can be interpreted both within human behaviour and health practice contexts.

Overall, the HPVS can be an excellent tool with which to identify value-related issues in clinical decision-making that may improve the quality of clinical-decisions, the quality of doctor-patient interactions and the quality of patient care.

5.2.2 Knowledge on the impact of values on clinical decision-making

This thesis has demonstrated that personal and professional values significantly influence clinical decision-making. Values influence the types of factors different students consider in their clinical decisions. This adds new empirical knowledge to an area of clinical practice (values and decision-making) in which very little empirical work has been undertaken. Findings from this thesis suggest that medical students' values are associated with personal biases on the factors they are likely to consider in decision-making. To improve clinical practice, assessment of values using an instrument such as the HPVS can help students and practitioners understand their values within the context of healthcare practice (individual values profile). They can then learn to safeguard against the personal biases to which their prominent values may predispose them, and learn to consider all relevant factors in given clinical situations so they can make the best decisions for their patients.

In particular, this thesis adds new knowledge that spirituality and critical thinking values are the most prominent values associated with biases in decision-making by medical students.

Students and practitioners who prioritise these values and are aware of the possible influence these values may have on their decision-making can use this knowledge to moderate their personal biases and act in the best interest of their patients at all times. However, beyond this thesis, it is more likely that clinical decision-making is significantly influenced by a wider range of values. It is possible that spirituality and critical thinking turned out to be the most significant values because of the clinical contexts studied in this thesis, and other values may be more significant than spirituality and critical thinking in other contexts.

Overall, the associations between values and decision-making established in this thesis can be relevant to students and practitioners wishing to improve their decision-making in terms of understanding the role their values may play in clinical decisions. Similarly, educators can use these findings to improve education on values and clinical decision-making.

5.3 Future directions from this thesis

There are two major directions of research that lead from this work. They involve investigating key findings from this thesis further.

1) In the present thesis, the HPVS was validated in a sample of predominantly medical students and medical professionals, although invitations were sent out to different healthcare student and professional groups. The sample was also of predominantly female participants. It will be important to validate the HPVS further in other professional groups and in samples that are more gender-balanced. This would sanction the HPVS as a multi-professional values instrument as it was developed from multi-professional literature (Chapter 2). In this regards, the HPVS could be a useful tool in teaching and assessing values across different professions and in interprofessional practice settings.

2) This thesis presented a theoretical structure of healthcare practitioners' values which was derived directly from Schwartz's values model. However, the validation study on the HPVS suggested that the HPVS and SVS measured related yet distinct constructs because of the different contexts in which they were measured. Therefore it is recommended that further studies empirically test and modify the theoretical structure of value relations from the HPVS. It is possible that a different structure from the one proposed in this thesis may be obtained because the context in which values interact in the healthcare practice (measured by the HPVS) is different from that in general life situations (measured by the SVS). If this turns out to be the case, the proposed theoretical structure of the HPVS may be modified or extended to a more informative and relevant structure within the context of decision-making in healthcare. This will enhance theory in the study of values and their role in decision-making in healthcare.

3) Since spirituality and critical thinking values showed a prominent influence on clinical decision-making, further studies in this area are recommended. Focused studies on the impact of these specific values on clinical decision-making, possibly using more detailed scales to measure spirituality and critical thinking values, could add further clarification on why, and how, these values influence clinical decisions significantly. Detailed scales for spirituality and critical thinking may include dimensions of spirituality and critical thinking as concepts as well as dimensions of the two as values. This thesis has already established item sets for spirituality and critical thinking as values. Items for spirituality and critical thinking as concepts can be sourced from literature or from already available instruments that measure the two concepts (Elkins, Hedstrom, Hughes, Leaf, & Saunders, 1988; Facione, Facione, & Sanchez, 1994; Genia, 1991; Underwood & Teresi, 2002; Watson, 1980).

5.4 Conclusion

This thesis concludes that students' values significantly influence their clinical decision-making. Helping students and practitioners identify and become aware of their values and how they may influence their decisions can improve their decision-making and quality of patient care. Spirituality and critical thinking stand out as key values that impact on students' decision-making, and the two values may show conflict in the manner in which they influence students' decision-making. However, this thesis suggests that students' decision-making approaches fall within a spectrum from humanistic care, which is strongly supported by the spirituality value, to evidence-based care, which is strongly supported by the critical thinking value. A balance within this spectrum of decision-making approaches would be ideal for optimal decision-making that benefits the patients most. Hence students and practitioners need to be aware of the impact of their values on decision-making, so that they can safeguard against being significantly biased towards one or the other extreme of the decision-making approach spectrum.

This thesis also established a new instrument to measure healthcare practitioners' values, the HPVS. The HPVS identifies key values across all healthcare professions, and embeds a theory on possible value compatibilities and conflicts. Individuals can use the tool to profile and understand their own value priorities. Educators and researchers can use the tool to study values in a theoretically informed manner. With further validation across different professional groups, it can be a useful tool in helping different professional groups understand their value priorities within a common framework and can therefore contribute to interprofessional education and practice. Overall, the HPVS can be a valuable tool with

which to identify value related issues in decision-making in clinical practice, to help practitioners improve the quality of their clinical decisions.

APPENDIX A Extracted value items organised into Schwartz's values framework

Schwartz Motivational Value Type	Identified healthcare practitioner value
ACHIEVEMENT: Personal success through demonstrating competence according to social standards	
Achievement	Capability/Competency/Effectiveness
Achievement	Achievement/Accomplishment
Achievement	Excellence
Achievement	Ambition
Achievement	Education/Knowledge/Research
Achievement	Logical/Rationality/Thinking/Realism
Achievement	Perseverance
Achievement	Personal development
Achievement	Reward
BENEVOLENCE: Preservation and enhancement of the welfare of people with whom one is in frequent personal contact	
Benevolence	Altruism
Benevolence	Empathy
Benevolence	Benevolence
Benevolence	Reliability/Dependability
Benevolence	Caring
Benevolence	Cheerfulness
Benevolence	Compassion
Benevolence	Forgiving
Benevolence	Generosity
Benevolence	Giving hope
Benevolence	Helping
Benevolence	Honesty
Benevolence	Kindness
Benevolence	Love
Benevolence	Loyalty/Fidelity
Benevolence	Promise keeping
Benevolence	Responsibility
Benevolence	Sympathy
Benevolence	Thoughtfulness
Benevolence	Trust
Benevolence	Warmth
Benevolence	Mentorship
Benevolence	Selflessness
Benevolence	Patient focus

Schwartz Motivational Value Type	Identified healthcare practitioner value
CONFORMITY: Restraint of actions, inclinations, and impulses likely to upset or harm others and violate social expectations or norms (subordination of oneself to current and possibly changing situations, practice ideals, professional and team expectations in health context)	
Conformity	Professionalism
Conformity	Duty/Service/Obligation
Conformity	Conformity
Conformity	Commitment
Conformity	Consistency
Conformity	Law abiding/Regulation
Conformity	Patience
Conformity	Politeness
Conformity	Role Model
Conformity	Self-awareness/Self-reflection/Self-evaluation
Conformity	Standards
Conformity	Interpersonal goals
Conformity	Team work
Conformity	Self-control/Temperance/Self-discipline
HEDONISM: Pleasure or sensuous gratification for oneself	
Hedonism	Pleasure/Enjoyment
POWER: Social status and prestige, control or dominance over people and resources	
Power	Authority
Power	Power
Power	Social recognition/Status/Image
Power	Leadership
Power	Courage
Power	Empowerment
Power	Image
Power	Paternalism
Power	Prosperity
SECURITY: Safety, harmony, and stability of society, of relationships, and of self	
Security	Privileges
Security	Safety
Security	Confidentiality
Security	Security/Prudence
Security	Protection
Security	Comfort

Schwartz Motivational Value Type	Identified healthcare practitioner value
Security	Companionship
Security	Convenience
Security	Economic security
Security	Emotional stability
Security	Privacy
Security	Professional association
Security	Vigilance
Security	Relationship/ Belonging
Security	Clean
SELF-DIRECTION: Independent thought and action - choosing, creating, exploring	
Self-Direction	Critical Thinking/Problem-solving
Self-Direction	Decision-making
Self-Direction	Freedom/Autonomy/Independence
Self-Direction	Choice
Self-Direction	Creativity/Imagination
Self-Direction	Objectivity
Self-Direction	Personal Satisfaction
Self-Direction	Resourcefulness
Self-Direction	Self confidence
Self-Direction	Curiosity/Inquisitiveness
Self-Direction	Self-fulfilment
SPIRITUALITY: Meaning of life, transcendence over reality	
Spirituality	Spirituality
Spirituality	Optimism
Spirituality	Faith
Spirituality	Harmony
Spirituality	Religion
Spirituality	Salvation
STIMULATION: Excitement, novelty, and challenge in life	
Stimulation	Personal stimulation
Stimulation	Excitement
Stimulation	Intellectual-stimulation
TRADITION: Respect for, commitment to, and acceptance of the customs and ideas that traditional culture or religion provides (subordination of oneself to more abstract objects, shared history, symbols, culture and expectations, e.g. beneficence, nonmalificence as foundation principles of medical practice)	
Tradition	Integrity

Schwartz Motivational Value Type	Identified healthcare practitioner value
Tradition	Morality
Tradition	Beneficence
Tradition	Nonmaleficence
Tradition	Tradition/Culture
Tradition	Courteousness
Tradition	Happiness/Contentment
Tradition	Humility
Tradition	Obedience
Tradition	Sincerity
Tradition	Truth
UNIVERSALISM: Understanding, appreciation, tolerance, and protection for the welfare of all people and for nature (interaction with, and enhancement of welfare groups outside ones extended in-group)	
Universalism	Equality/Equity/Equanimity
Universalism	Justice/Rights/Fairness/Ethical
Universalism	Dignity
Universalism	Activism/Advocacy
Universalism	Universalism
Universalism	Appreciation
Universalism	Authenticity
Universalism	Beauty/Aesthetics/Quality
Universalism	Broadminded/Openness
Universalism	Charity/Philanthropism
Universalism	Collaboration/Cooperation
Universalism	Collectivism/Socialism
Universalism	Conscientiousness
Universalism	Contribution/Involvement/Community participation
Universalism	Honour
Universalism	Peace
Universalism	Respect
Universalism	Understanding/Sensitivity
Universalism	Wisdom
Universalism	Peer Review
Universalism	Accountability
Universalism	Virtue

APPENDIX B Mapping example, mapping extracted values into Schwartz tradition and conformity values

The motivational goals of tradition and conformity values emphasise the subordination of one's needs to socially imposed expectations. Schwartz (1992) found these values hard to separate in structural analysis studies. The values commonly located intermixed in the structural analysis (Figure 2.1). This intermixing of values because of shared motivation is also apparent in the healthcare morality and professionalism values that we derived from the two Schwartz values.

Duty and integrity were mapped onto the Schwartz value type of tradition, and professionalism and accountability, which are closely related duty integrity, onto Schwartz value type of conformity. The theoretical justification for this mapping is that in the tradition value type, people subordinate their needs to time-honoured or customary beliefs (Schwartz, 1992). Duty and integrity in healthcare are time-honoured values. Hence, they fitted better into the tradition value type than the conformity one. In contrast, in the conformity value type people subordinate their needs to contemporary rules and structures (Schwartz, 1992) such as ethical codes and organisation rules. Hence professionalism and accountability fitted better into the conformity value type than the tradition one because they typically represent expectations at a given time, and expectations that change with time.

APPENDIX C Healthcare Practitioner Values Scale validation survey (online forms)

Healthcare Practitioner Values Survey

Participant Information

My name is Mpatisi Moyo, and I am a PhD student at the University of Auckland. First, I would like to thank you for your consideration to participate in this study. Your participation is highly valued.

This is an online pilot questionnaire for the Healthcare Practitioner Values Scale. The aim of the Healthcare Practitioner Values Scale is to determine which values are important to healthcare professionals and students in the context of decision-making in clinical practice. Using the survey before and after specified education and training activities will provide information about how the values of healthcare students or practitioners may be changed with such interventions. This is important because we currently know very little about how students' or practitioners' values may change gradually over time in training or practice. In this pilot survey we seek to validate the new Healthcare Practitioner Values Scale by investigating its agreement with a widely used and validated personal values tool, the Schwartz Personal Values Survey.

The survey may take about 30 to 45 minutes to complete. Please take your time to read the questions carefully and respond as honestly as possible. Your responses will be very valuable in the development of the final Healthcare Practitioner Values Scale.

Your participation in this study is completely voluntary. Your responses in this research will remain confidential. Your identity will never be revealed to the researchers at any time. The survey dataset will be stored securely in an electronic database in a secure server in the School of Population Health for a period of up to 6 years. After this period it will be permanently deleted. Only Mpatisi Moyo and his research associates will have access to your data. You may withdraw from this study at any time up until the point at which you complete and post back the questionnaire. Finally, this research will be published but your identity will

never be revealed or associated with the data. Results from the study may be sent to you if you wish. You will need to provide an e-mail where the results can be sent.
This survey is conducted solely for the purposes of academic scientific research, and aims to provide information about the values in healthcare practice for healthcare students, practitioners and educators. This study is funded by my University of Auckland Postgraduate Research Student Support (PReSS) fund.

For any questions regarding this project, please contact Mpatisi Moyo (details below) or the Head of the Centre for Medical and Health Sciences Education, Associate Prof. Jennifer Weller, The University of Auckland, Private Bag 92019, Auckland. Phone 09-373-7599, ext. 89459. For ethical concerns contact: The Chair, The University of Auckland Human Participants Ethics Committee, The University of Auckland, Private Bag 92019, Auckland. Phone 09-373-7599, extn. 87830.

Mpatisi Moyo
PhD student
Department of General Practice and Primary Health Care
University of Auckland
Phone: 09 373 7599, extn
E-mail: m.moyo@auckland.ac.nz

Participant Consent Form

This form is to gather your consent to participate in this pilot phase of the Healthcare Practitioner Values Scale. Only Mpatisi Moyo and his research associates will have access to your responses. Your personal information will be kept separate from your responses at all times. Your questionnaire will be identified by an anonymous code. An electronic copy of all responses will be stored for up to 6 years for research purposes in a secure database in a secure server in the School of Population Health. After this period the data will be permanently deleted.

Please confirm your consent to participate in this survey by signing the last statement below with your initials if you agree to all the following:

I have read and understood the participant information for this study.
I understand that my data will remain confidential at all times.
I consent to the publication of the results of the project with the understanding that my anonymity will be preserved.
I understand that I am free to withdraw my responses to this questionnaire up until the point at which I complete and submit them.
I understand that completion of this online questionnaire implies my consent.

On this basis of the above, I agree to take part in this survey
Initials _____

APPROVED BY THE UNIVERSITY OF AUCKLAND HUMAN PARTICIPANTS ETHICS COMMITTEE ON **18/10/2013**. REFERENCE NUMBER: **010359/2013**

Survey Instructions

This survey consists of 3 parts:

1. Healthcare Practitioner Values Scale
2. Schwartz Personal Values Survey
3. Personal Information

Please complete all of the questions.

Please take your time, read the questions carefully, and respond as honestly as possible.

Part 1: Healthcare Practitioner Values Scale

On the next page a list of 11 values is arranged in alphabetical order. Each value is accompanied by a short description in parentheses and a blank space. Your goal is to rank each value in its order of importance to you. Study each list and think of how much each value may act as a guiding principle in your clinical/health practice. Clinical/health practice includes work in professional placements for students.

To begin, select the value that is of most importance to you in the context of your clinical/health practice. Write the number 1 in the blank space next to that value. Next, choose the value that is second in importance to you and write the number 2 in the blank next to it. Work your way through the list until you have ranked all 11 values on this page.

When ranking, take your time and think carefully. Feel free to go back and change your order should you have second thoughts about any of your answers. When you have completed the ranking of the set of values, the result should represent an accurate picture of how you really feel about what's important in your clinical practice.

Values List

Importance to ME as guiding principle in MY clinical / health practice

Rank

1 Altruism (selfless concern for the welfare of others) _____

2 Authority (the right to lead or command) _____

3 Capability (competent, effective and efficient) _____

4 Critical thinking (application of sound and objective reasoning in making judgments) _____

5 Equality (equal opportunities for all) _____

6 Intellectual-stimulation (enjoying a mental challenge) _____

7 Morality (belief in some conduct being right or wrong, and the desire to do right) _____

8 Pleasure (gratification of desires) _____

9 Professionalism (highest standards of ethical and professional behaviour) _____

10 Safety (protection of self and others from risk or harm) _____

11 Spirituality (belief in meaning of life higher than everyday existence) _____

Part 2: Schwartz Personal Values Survey

In this questionnaire you are to ask yourself: **"what values are important to ME as a guiding principle in MY life, and what values are less important to me?"** A list of values is given in the following pages. In the parentheses following each value is an explanation that may help you understand its meaning.

Your task is to rate how important each value is for you as a guiding principle in your life. Use the rating scale below:

-1 is for rating any values opposed to the principles that guide you.
0 - means the value is not important at all, it is not relevant as a guiding principle for you.
3 - means the value is important.
6 - means the value is very important.
7 is for rating a value of supreme importance as a guiding principle in your life:

In the scale after each value , tick in the box with the number (-1,0,1,2,3,4,5,6,7) that indicates the importance of that value to you**, personally**. Try to distinguish as much as possible between the values by using all the full scale. You will, of course, need to use numbers more than once. Feel free to go back and change your rating should you have second thoughts about any of your answers.

Opposed to my values	**Not important**			**Important**			**Very important**	**Of Supreme Importance**
-1	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**

Values List

Before you begin, read the values in the list, choose the one that is most important to you and rate its importance. Next, choose the value that is most opposed to your values and rate it -1. If there no such values, choose the value least important to you and rate it 0 or -1, according to its importance. Then proceed to rate the rest of the values.

Importance to ME as a guiding principle in MY life

1 EQUALITY (equal opportunity for all)	-1	0	1	2	3	4	5	6	7
2 INNER HARMONY (at peace with myself)	-1	0	1	2	3	4	5	6	7
3 SOCIAL POWER (control over others, dominance)	-1	0	1	2	3	4	5	6	7
4 PLEASURE (gratification of desires)	-1	0	1	2	3	4	5	6	7
5 FREEDOM (freedom of action and thought)	-1	0	1	2	3	4	5	6	7
6 A SPIRITUAL LIFE (emphasis on spiritual not material matters)	-1	0	1	2	3	4	5	6	7
7 SENSE OF BELONGING (feeling that others care about me)	-1	0	1	2	3	4	5	6	7
8 SOCIAL ORDER (stability of society)	-1	0	1	2	3	4	5	6	7
9 AN EXCITING LIFE (stimulating experiences)	-1	0	1	2	3	4	5	6	7
10 MEANING IN LIFE (a purpose in life)	-1	0	1	2	3	4	5	6	7
11POLITENESS (courtesy, good manners)	-1	0	1	2	3	4	5	6	7
12 WEALTH (material possessions, money)	-1	0	1	2	3	4	5	6	7
13 NATIONAL SECURITY (protection of my nation from enemies)	-1	0	1	2	3	4	5	6	7
14 SELF RESPECT (belief in one's own worth)	-1	0	1	2	3	4	5	6	7
15 RECIPROCATION OF FAVOURS (avoidance of indebtedness)	-1	0	1	2	3	4	5	6	7
16 CREATIVITY (uniqueness, imagination)	-1	0	1	2	3	4	5	6	7
17 A WORLD AT PEACE (free of war and conflict)	-1	0	1	2	3	4	5	6	7
18 RESPECT FOR TRADITION (preservation of time-honoured customs)	-1	0	1	2	3	4	5	6	7
9 MATURE LOVE (deep emotional & spiritual intimacy)	-1	0	1	2	3	4	5	6	7
20 SELF-DISCIPLINE (self-restraint, resistance to temptation)	-1	0	1	2	3	4	5	6	7
21 PRIVACY (the right to have a private sphere)	-1	0	1	2	3	4	5	6	7
22 FAMILY SECURITY (safety for loved ones)	-1	0	1	2	3	4	5	6	7
23 SOCIAL RECOGNITION (respect, approval by others)	-1	0	1	2	3	4	5	6	7
24 UNITY WITH NATURE (fitting into nature)	-1	0	1	2	3	4	5	6	7
25 A VARIED LIFE (filled with challenge, novelty and change)	-1	0	1	2	3	4	5	6	7
26 WISDOM (a mature understanding of life)	-1	0	1	2	3	4	5	6	7

27 AUTHORITY (the right to lead or command)	-1	0	1	2	3	4	5	6	7
28 TRUE FRIENDSHIP (close, supportive friends)	-1	0	1	2	3	4	5	6	7
29 A WORLD OF BEAUTY (beauty of nature and the arts)	-1	0	1	2	3	4	5	6	7
30 SOCIAL JUSTICE (correcting injustice, care for the weak)	-1	0	1	2	3	4	5	6	7
31 INDEPENDENT (self-reliant, self-sufficient)	-1	0	1	2	3	4	5	6	7
32 MODERATE (avoiding extremes of feeling & action)	-1	0	1	2	3	4	5	6	7
33 LOYAL (faithful to my friends, group)	-1	0	1	2	3	4	5	6	7
34 AMBITIOUS (hard-working, aspiring)	-1	0	1	2	3	4	5	6	7
35 BROADMINDED (tolerant of different ideas and beliefs)	-1	0	1	2	3	4	5	6	7
36 HUMBLE (modest, self-effacing)	-1	0	1	2	3	4	5	6	7
37 DARING (seeking adventure, risk)	-1	0	1	2	3	4	5	6	7
38 PROTECTING THE ENVIRONMENT (preserving nature)	-1	0	1	2	3	4	5	6	7
39 INFLUENTIAL (having an impact on people and events)	-1	0	1	2	3	4	5	6	7
40 HONOURING OF PARENTS AND ELDERS (showing respect)	-1	0	1	2	3	4	5	6	7
41 CHOOSING OWN GOALS (selecting own purposes)	-1	0	1	2	3	4	5	6	7
42 HEALTHY (not being sick physically or mentally)	-1	0	1	2	3	4	5	6	7
43 CAPABILITY (competent, effective, efficient)	-1	0	1	2	3	4	5	6	7
44 ACCEPTING MY PORTION IN LIFE (submitting to life's circumstances)	-1	0	1	2	3	4	5	6	7
45 HONEST (genuine, sincere)	-1	0	1	2	3	4	5	6	7
46 PRESERVING MY PUBLIC IMAGE (protecting my "face")	-1	0	1	2	3	4	5	6	7
47 OBEDIENT (dutiful, meeting obligations)	-1	0	1	2	3	4	5	6	7
48 INTELLIGENT (logical, thinking)	-1	0	1	2	3	4	5	6	7
49 HELPFUL (working for the welfare of others)	-1	0	1	2	3	4	5	6	7
50 ENJOYING LIFE (enjoying food, sex, leisure, etc.)	-1	0	1	2	3	4	5	6	7
51 DEVOUT (holding to religious faith & belief)	-1	0	1	2	3	4	5	6	7
52 RESPONSIBLE (dependable, reliable)	-1	0	1	2	3	4	5	6	7
53 CURIOUS (interested in everything, exploring)	-1	0	1	2	3	4	5	6	7
54 FORGIVING (willing to pardon others)	-1	0	1	2	3	4	5	6	7
55 SUCCESSFUL (achieving goals)	-1	0	1	2	3	4	5	6	7
56 CLEAN (neat, tidy)	-1	0	1	2	3	4	5	6	7
57 SELF-INDULGENT (doing pleasant things)	-1	0	1	2	3	4	5	6	7
58 OBSERVING SOCIAL NORMS (to maintain face)	-1	0	1	2	3	4	5	6	7

Part 3: Personal Information

Section A

Students

Please state your programme of study in healthcare

_____

How many years have you completed in your undergraduate studies _____

Currently working

What is your current main occupation in healthcare? _____

How long have you been in health practice after
your undergraduate studies _____

Section B

1. What is your gender?

- Male
- Female

2. What is your age?

- 18-29 years old
- 30-49 years old
- 50-64 years old
- 65 years and over

3. What is the highest level of education you have completed?

- some high school
- high school graduate

- some college
- trade/technical/vocational training
- college graduate
- some postgraduate work
- post graduate degree

4. What is your religious preference?

- Mormon
- Christian Scientist
- Roman Catholic
- an Orthodox church such as the Greek or Russian Orthodox church
- Seventh-Day Adventist
- Muslim
- Jewish
- Protestant
- Choose not say
- Other: Please specify _____

APPENDIX D Grouping Schwartz's 11 Value types from SVS survey items in Study 2

Value Type		*SVS Questionnaire Items*
1.	**Conformity**	***11, 20, 40, 47***
2.	***Tradition***	***18, 32, 36, 44, 51***
3.	**Benevolence**	***33, 45, 49,52, 54***
4.	***Universalism***	***1, 17, 24, 26, 29, 30, 35, 38***
5.	**Self-Direction**	***5, 16, 31, 41, 53***
6.	***Stimulation***	***9, 25, 37***
7.	**Hedonism**	***4, 50, 57***
8.	***Achievement***	***34, 39, 43, 55***
9.	**Power**	***3, 12, 27, 46, 58***
10.	***Security***	***8, 13, 15, 22, 56***
11.	***Spirituality***	***2, 6 , 10***

APPENDIX E Correlation of correlations data for a single bootstrap sample

Table E1 SVS and HPVS inter-value correlations (value interrelations within SVS and HPVS)

Dataset of correlations from one bootstrap sample				
	SVS pair	HPVS pair	SVS pair correlation	HPVS pair correlation
1	Power vs. Achievement	Authority vs. Capabilty	0.4718	0.1312
2	Power vs. Hedonism	Authority vs. Pleasure	0.4126	-0.1396
3	Power vs. Stimulation	Authrity vs. Intellectual-stimulation	0.2003	0.1742
4	Power vs. Self-direction	Authority vs. Critical thinking	0.1063	0.3589
5	Power vs. Universalism	Authority vs. Equality	-0.0227	-0.1365
6	Power vs. Benevolence	Authority vs. Altruism	0.0686	-0.3488
7	Power vs. Spirituality	Authority vs. Spirituality	-0.0873	-0.3314
8	Power vs. Tradition	Authority vs. Morality	0.0790	-0.0822
9	Power vs. Conformity	Authority vs. Professionalism	0.4155	0.1567
10	Power vs. Security	Authority vs. Safety	0.5111	-0.1554
	↓	↓	↓	↓	↓
55	Security vs. conformity	Safety vs. Professionalism	0.6688	0.1559

APPENDIX F Values and Decision-making survey

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www.health.auckland.ac.nz

PARTICIPANT INFORMATION SHEET FOR STUDENTS

Re: Inviting students in the School of Medicine, MBChB Year 5, to participate in a study about healthcare values

Project Title: Healthcare Practitioner Values Survey

Researchers:

Principal Investigator: Prof. Felicity Goodyear-Smith

Student: Mpatisi Moyo, PhD Health Sciences

Supervisors: Dr Boaz Shulruf

A. Prof Jennifer Weller

Project Description and Invitation

This a questionnaire for healthcare practitioner values and clinical decision-making. Its aim is to determine the relationship between values and clinical decision-making by medical students. The Healthcare Practitioner Values Scale (HPVS) has been recently validated against an established values survey the Schwartz Personal Values Survey. We intend to use the survey at the beginning of the 5th year MBChB programme, Jan 2015, to investigate how your values as a medical students relate to your clinical decision-making which will be , measured through case scenarios. This is important because we currently know very little about how students' or practitioners' values influence their clinical decision-making.

Project Procedures

The survey will take about 10 minutes to complete. The data will be used to investigate the relationship between values and clinical decision-making.

Anonymity and Confidentiality

Your participation in this study is completely voluntary. The survey is anonymous, your identity data will not be collected by the researchers. The responses from the survey will remain confidential. Finally, the research will be published but your identity will never be revealed nor associated with the data. Results from the study will be presented in an academic seminar and invitations to the seminar will be sent to your Department.

Right to Withdraw from Participation

You may withdraw from the study at any time up until the point at which you complete and submit the questionnaire. Your Head of Department (HOD) has given consent for the study and his assurance that non-participation in the survey will not affect your academic grades or professional relationships in any way.

A reminder to complete the survey will be sent out seeking responses from those who have not have responded. However, you may ignore this reminder if you have completed the survey or do not wish to participate at all.

Consent to participate

This is an anonymous survey, completion of the survey counts as your consent to take part in this study.

Data Storage and destruction

The survey dataset will be stored securely in an electronic database in a secure server in the Department of General Practice & Primary Health Care for a period of up to 6 years. After this period it will be permanently deleted. Only I (Mpatisi Moyo) and my research associates will have access to the data.

Funding for the Project

This survey is conducted solely for the purposes of academic scientific research, and aims to provide information about values in healthcare practice for healthcare students, practitioners

and educators. It is funded by my University of Auckland Postgraduate Research Student Support (PReSS) fund.

For any questions regarding this project, please contact Mpatisi Moyo (details below) or my supervisor Prof. Felicity Goodyear-Smith, The University of Auckland, Private Bag 92019, Auckland, E-mail f.goodyear-smith@auckland.ac.nz. For ethical concerns contact: The Chair, The University of Auckland Human Participants Ethics Committee, The University of Auckland, Private Bag 92019, Auckland. Phone 09-373-7599, extn. 87830.

Questions and Concerns about this research

Supervisor:	**Head Of Department:**
Prof Felicity Goodyear-Smith Department of General Practice and Primary Health Care University of Auckland Phone: 09-373-7599, ext. 82357 E-mail f.goodyear-smith@auckland.ac.nz	Prof Felicity Goodyear-Smith Department of General Practice and Primary Health Care University of Auckland Phone: 09-373-7599, ext. 82357 E-mail f.goodyear-smith@auckland.ac.nz

APPROVED BY THE UNIVERSITY OF AUCKLAND HUMAN PARTICIPANTS ETHICS COMMITTEE ON **04/01/2014** for (3) years, Reference Number **011073/2014**

The University of Auckland
Private Bag 90219
Auckland
New Zealand
Phone: 09) 373 7599 (Ext 89459)
Email: f.gooyear-smith@auckland.ac.nz
www.health.auckland.ac.nz

Participant Consent Form for Students

(This form will be held for six years)

Project title: Values and clinical decision-making in medical students.

Researchers:

Mpatisi Moyo MSc. Student, PhD Health Sciences

Supervisors: Professor Felicity Goodyear-Smith MBChB, MGP, FRNZCGP.
Dr Boaz Shulruf MPH, PhD.
Professor Jennifer Weller

I have read and I understand the information sheet dated January 2015 for volunteers taking part in the study designed to measure the relationship between values and clinical decision-making in medical students. I have had the opportunity to discuss this study. I am satisfied with the answers I have been given.

I have had the opportunity to use whānau support or a friend to help me ask questions and understand the study.

I understand that taking part in this study is voluntary (my choice), and that I may withdraw from the study at any time, and this will in no way affect my academic progress.

I understand that my participation in this study is confidential and that no material that could identify me will be used in any reports on this study.

I have had time to consider whether to take part in the study.

I know who to contact if I have any side effects from the study.

I know who to contact if I have any questions about the study in general.

I wish / do not wish to receive a summary of the findings.

I (*full name*) hereby consent to take part in this study.

Date:	
Signature:	
Full names of researchers:	
Contact phone number for researchers:	
Project explained by:	
Project role:	
Signature:	
Date:	

This study has received ethical approval from the **UAHPEC Ethics Committee**, ethics reference number **01103/2014.**

Values and decision-making survey

Survey Instructions

Please complete all of the questions in Part A and Part B.

Please take your time, read the questions carefully, and respond as honestly as possible.

On the next page a list of 11 values is arranged in alphabetical order. Each value is accompanied by a short description in parentheses and a blank space. Your goal is to rank each value in its order of importance to you. Study each list and think of how much each value may act as a guiding principle in your clinical/health practice. Clinical/health practice includes work in professional placements for students.

To begin, select the value that is of most importance to you in the context of your clinical/health practice. Write the number 1 in the blank space next to that value. Next, choose the value that is second in importance to you and write the number 2 in the blank next to it. Work your way through the list until you have ranked all 11 values on this page.

When ranking, take your time and think carefully. Feel free to go back and change your order should you have second thoughts about any of your answers. When you have completed the ranking of the set of values, the result should represent an accurate picture of how you really feel about what's important in your clinical practice.

Part A Healthcare Practitioner Values Scale

Values List

Importance to ME as guiding principle in MY clinical / health practice

Rank

1 Altruism (selfless concern for the welfare of others) _____

2 Authority (the right to lead or command) _____

3 Capability (competent, effective and efficient) _____

4 Critical thinking (application of sound and objective reasoning in making judgments) _____

5 Equality (equal opportunities for all) _____

6 Intellectual-stimulation (enjoying a mental challenge) _____

7 Morality (belief in some conduct being right or wrong, and the desire to do right) _____

8 Pleasure (gratification of desires) _____

9 Professionalism (highest standards of ethical and professional behaviour) _____

10 Safety (protection of self and others from risk or harm) _____

11 Spirituality (belief in meaning of life higher than everyday existence) _____

Part B Clinical Decision-making

Instructions

For *each* of the following *four* scenarios pleases list (e.g. in bullet point form) ***the issues and considerations that would matter to you and your patient*** in coming to a clinical decision.

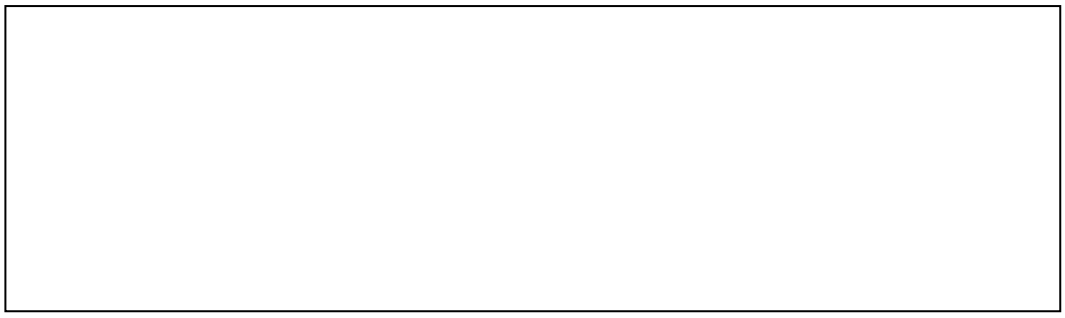
Please write your answers in the empty spaces after each scenario description.

Do not worry about grammar or complete sentences, keywords or short phrases expressing the issues and considerations that matter will suffice.

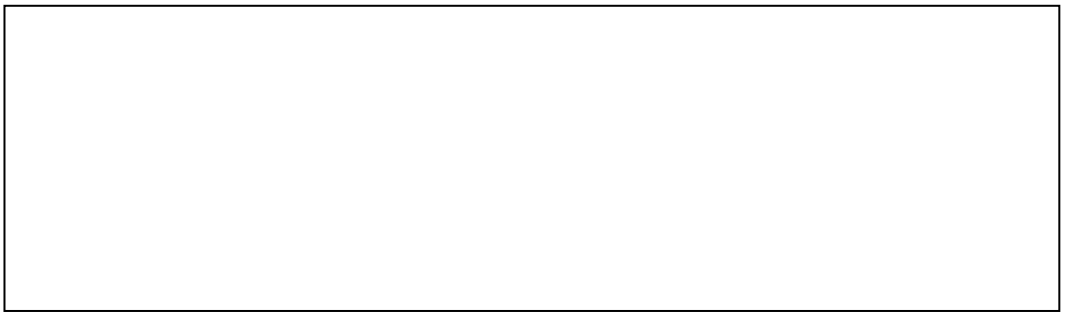
1) George is 59 year old European male married with four children. He works as a bus driver. He is generally well. His wife has suggested he has a PSA test for prostate cancer screening. He has no family history of symptoms.

2) Jane is a 14 year old girl with severe facial acne, who has given a history of not being sexually active. She is requesting Roaccutane, which has worked well for her friend.

3) Raju is an obese 75 year old immigrant from India. He has had type two diabetes for the last 15 years and has had two myocardial infarctions in the past six months. He has just been discharged from hospital since the last one and is aware that another event may be fatal. He is on appropriate medication but still suffers from angina and shortness of breath. Clinically he is not suitable for any surgical treatment. He is asking you about possible future management and wants to discuss various circumstances and care this last stage of his life.



4) Sarah is a 40 year European patient, married with a grown-up daughter. She owns a successful fashion boutique. She has developed crow's feet at the edges of her eyes and some wrinkling under her mouth. She requests that you treat her with botox. You have not previously provided this form of treatment but she is the 6th person with this request in the last 3 months.



APPENDIX G Difference in values by decision factor considered in each clinical scenario

Table G1 Patient perspective (Significant rank differences are highlighted bold)

HPVS value / factor considered	**PSA screening case**			**Roaccutane treatment case**			**End-of-life management case**			**Botox treatment case**		
	Yes N=103 (88.8%)	Nil N=13 (11.2%)	p-value	Yes N=108 (93.1%)	Nil N=8 (6.9%)	p-value	Yes N=114 (98.3%)	Nil* N=2 (1.7%)	p-value	Yes N=85 (73.3%)	Nil N=31 (26.7%)	p-value
Altruism	4.5 (4.0, 5.0)	4.8 (2.9, 6.7)	0.766	4.6 (4.0, 5.1)	3.8 (1.8, 5.7)	0.36	4.5 (4.0, 5.0)	6	0.362	4.5 (3.9, 5.2)	4.43 (3.37,5.5)	0.859
Authority	9.1 (8.7, 9.5)	9.5 (8.5, 10.4)	0.476	9.1 (8.7, 9.5)	9.9 (8.4, 11.3)	0.254	9.1 (8.8, 9.5)	10	0.543	9.1 (8.6, 9.5)	9.03 (8.3,9.76)	0.953
Capability	3.7 (3.2, 4.2)	2.9 (1.4, 4.3)	0.258	3.5 (3.1, 4.0)	4.4 (2.3, 6.5)	0.382	3.6 (3.1, 4.0)	4	0.747	3.69 (3.2, 4.2)	3.33 (2.44,4.22)	0.488
Critical thinking	5.4 (4.9, 5.9)	4.6 (3.4, 5.8)	0.249	5.2 (4.7, 5.7)	5.9 (4.2, 7.5)	0.398	5.3 (4.8, 5.8)	3.5	0.603	**5.4 (4.9, 6.0)**	**4.4 (3.5, 5.2)**	**0.037***
Equality	5.7 (5.2, 6.2)	5.5 (4.3, 6.7)	0.818	5.7 (5.2, 6.2)	5.4 (3.4, 7.4)	0.732	5.7 (5.2, 6.1)	5	0.859	5.82 (5.27,6.37)	5.3 (4.5, 6.1)	0.31
Intellectual-stimulation	7.3 (6.9, 7.8)	7.9 (6.8, 9.0)	0.311	7.4 (7.0, 7.8)	7.6 (5.7, 9.5)	0.783	7.4 (7.0, 7.8)	7.5	0.959	7.27 (6.8, 7.8)	7.5 (6.8, 8.3)	0.611
Morality	4.6 (4.1, 5.1)	5.1 (3.6, 6.6)	0.518	**4.8 (4.3, 5.2)**	**2.9 (1.3, 4.5)**	**0.025***	4.6 (4.2, 5.1)	5	0.924	**4.3 (3.8, 4.8)**	**5.4 (4.5, 6.3)**	**0.037***
Pleasure	9.02 (8.6, 9.5)	9.8 (9.1, 10.4)	0.054	9.2 (8.8, 9.6)	7.8 (4.7, 10.8)	0.296	9.1 (8.7, 9.5)	10	0	9.1 (8.7, 9.6)	8.8 (7.8, 9.9)	0.666
Professionalism	4.5 (4.1, 5.0)	3.8 (2.7, 4.9)	0.195	4.3 (3.9, 4.7)	6.4 (4.2, 8.5)	0.055	4.4 (4.0, 4.9)	4	0.048	4.4 (3.8, 4.9)	4.4 (3.6, 5.3)	0.866
Safety	4.2 (3.7, 4.6)	3.8 (2.4, 5.2)	0.591	4 (3.5, 4.5)	5.6 (3.5, 7.7)	0.112	4.1 (3.7, 4.6)	2	0.265	4.1 (3.6, 4.7)	4.1 (3.2, 5.0)	0.954
Spirituality	8.1 (7.4, 8.8)	8.5 (6.7, 10.2)	0.705	8.3 (7.6, 8.9)	6.5 (2.6, 10.5)	0.326	8.2 (7.5, 8.8)	9	0.744	**7.7 (6.8, 8.5)**	**9.2 (8.1,10.3)**	**0.024***

Table G2 Family and social circumstances (Significant rank differences are highlighted bold)

HPVS value / factor considered	PSA screening case			Roaccutane treatment case			End-of-life management case			Botox treatment case		
	Yes N=86 (74.1%)	Nil N=30 (25.9%)	p-value	Yes N=59 (50.8%)	Nil N=57 (49.1%)	p-value	Yes N=86 (74.1%)	Nil N=30 (25.9%)	p-value	Yes N=33 (28.4%)	Nil N=83 (71.6%)	p-value
Altruism	4.3 (3.7, 4.9)	5.1 (4.0, 6.2)	0.211	4.9 (4.2, 5.7)	4.1 (3.4, 4.8)	0.112	4.5 (3.9, 5.1)	4.7 (3.6, 5.8)	0.71	4 (3.0, 5.0)	4.7 (4.1, 5.3)	0.217
Authority	9.3 (8.8, 97)	8.8 (8.1, 9.5)	0.296	9.4 (8.9, 9.8)	8.93 (8.4, 9.65	0.233	9.3 (8.9, 9.7)	8.7 (7.9, 9.5)	0.208	**9.7 (9.1, 10.1)**	**8.9 (8.4, 9.4)**	**0.049***
Capability	3.6 (3.1, 4.1)	3.5 (2.6, 4.4)	0.89	3.5 (3.0, 4.1)	3.63 (3.0, 4.3)	0.844	3.7 (3.1, 4.2)	3.4 (2.5, 4.3)	0.564	3.6 (2.7, 4.4)	3.6 (3.1, 4.2)	0.924
Critical thinking	5.4 (4.8, 6.0)	4.9 (4.0, 5.8)	0.34	**5.8 (5.1, 6.4)**	**4.8 (4.1, 5.4)**	**0.031***	5.5 (5.0, 6.1)	4.5 (3.6, 5.4)	0.063	5.6 (4.6, 6.6)	5 (4.5, 5.5)	0.274
Equality	5.6 (5.0, 6.1)	6 (5.0, 7.0)	0.402	5.8 (5.2, 6.4)	5.54 (4.8, 6.2)	0.606	5.8 (5.2, 6.3)	5.4 (4.4, 6.3)	0.448	5.4 (4.6, 6.2)	5.8 (5.3, 6.4)	0.368
Intellectual-stimulation	7.4 (6.9, 7.9)	7.5 (6.6, 8.3)	0.865	7.4 (6.8, 8.0)	7.4 (6.8, 8.0)	0.994	7.5 (7.0, 8.0)	7.2 (6.3, 8.1)	0.522	7.8 (6.9, 8.6)	7.2 (6.7, 7.7)	0.221
Morality	4.7 (4.1, 5.2)	4.6 (3.7, 5.6)	0.973	4.3 (3.7, 5.0)	5 (4.3, 5.6)	0.162	4.5 (4.0, 5.0)	5 (4.0, 6.0)	0.346	4.3 (3.4, 5.2)	4.7 (4.2, 5.2)	0.433
Pleasure	8.9 (8.4, 9.4)	9.6 (9.9, 10.2)	0.05	9.1 (8.5, 9.6)	9.2 (8.7, 9.7)	0.784	9.1 (8.6, 9.6	9.2 (8.6, 9.8)	0.737	8.9 (8.2, 9.6)	9.1 (8.6, 9.6)	0.584
Professionalism	4.4 (3.9, 4.9)	4.5 (3.6, 5.4)	0.835	4.5 (3.9, 5.1)	4.4 (3.8, 5.0)	0.866	4.4 (3.9, 4.9)	4.6 (3.9, 5.4)	0.537	4.7 (3.9, 5.6)	4.2 (3.7, 4.8)	0.326
Safety	4.2 (3.6, 4.7)	3.9 (3.0, 4.8)	0.659	3.7 (3.1, 4.3)	4.5 (3.9, 5.2)	0.068	4.2 (3.6, 4.7)	4 (3.1, 4.8)	0.709	4.2 (3.4, 5.0)	4.1 (3.5, 4.7)	0.852
Spirituality	8.4 (7.7, 9.1)	7.5 (6.0, 8.1)	0.241	7.8 (6.8, 8.7)	8.6 (7.7, 9.5)	0.19	**7.8 (6.9, 8.6)**	**9.3 (8.3, 10.3)**	**0.018***	8.09 (6.8, 9.4)	8.1 (7.3, 8.9)	0.977

Table G3 Patient safety (Significant rank differences are highlighted bold)

HPVS value / factor considered	PSA screening case			Roaccutane treatment case			End-of-life management case			Botox treatment case		
	Yes N=106 (91.4%)	Nil N=10 (8.6%)	p-value	Yes N=41 (35.3%)	Nil N=75 (64.6%)	p-value	Yes N=3 (2.6%)	Nil N=113 (97.4%)	p-value	Yes N=46 (39.7%)	Nil N=70 (60.3%)	p-value
Altruism	4.8 (2.9,6.7)	4.5 (4.0, 5.0)	0.741	4.8 (3.9, 5.8)	4.4 (3.7, 5.0)	0.405	4.3 (0.5, 8.1)	4.5 (4.0, 5.1)	0.847	5.1 (4.2, 5.9)	4.2 (3.5, 4.8)	0.094
Authority	9 (7.2, 10.8)	9.2 (8.8, 9.5)	0.847	9.4 (8.8, 10.1)	9 (8.6, 9.4)	0.279	8.3 (3.2, 13.5)	9.2 (8.8, 9.5)	0.56	8.9 (8.2, 9.5)	9.2 (8.7, 9.7)	0.457
Capability	3.8 (1.4, 6.3)	3.6 (3.1, 4.0)	0.837	3.1 (2.4, 3.8)	3.9 (3.3, 4.4)	0.105	3.33 (-4.7, 11.3)	3.6 (3.1, 4.0)	0.902	3.9 (3.2, 4.7)	3.4 (2.8, 4.0)	0.253
Critical thinking	4.4 (3.2, 5.6)	5.4 (4.9, 5.9)	0.135	4.8 (4.1, 5.6)	5.5 (4.9, 6.1)	0.164	4.3 (-0.8, 10.0)	5.3 (4.8, 5.8)	0.511	5.3 (4.5, 6.1)	5.1 (4.5, 5.7)	0.66
Equality	6.4 (4.3, 8.5)	5.6 (5.1, 6.1)	0.422	5.4 (4.7, 6.1)	5.8 (5.2, 6.4)	0.354	5.67 (-2.0, 13.3)	5.7 (5.2, 6.1)	0.999	5.6 (4.8, 6.5)	5.7 (5.2, 6.3)	0.798
Intellectual-stimulation	7.6 (6.2, 9.0)	7.5 (7.0, 7.8)	0.744	7.2 (6.4, 7.9)	7.6 (7.0, 8.1)	0.356	8.3 (4.5, 12.1)	7.4 (7.0, 7.8)	0.394	7.2 (6.6, 7.9)	7.4 (6.8, 7.9)	0.746
Morality	4.3 (1.9, 6.7)	4.7 (4.2, 5.1)	0.732	4.8 (4.0, 5.6)	4.6 (4.0, 5.1)	0.618	5.7 (-2.3, 13.7)	4.6 (4.2, 5.1)	0.63	4.3 (3.5, 5.0)	4.8 (4.2, 5.3)	0.309
Pleasure	8.6 (7.2, 10.0)	9.2 (8.7, 9.6)	0.403	9.2 (8.6, 9.7)	9.1 (8.5, 9.6)	0.781	**10.7 (9.2, 12.1)**	**9.1 (8.7, 9.5)**	**0.017***	9 (8.3, 9.7)	9.1 (8.6, 9.6)	0.873
Professionalism	4.8 (3.0, 6.6)	4.4 (4.0, 4.8)	0.634	4.5 (3.8, 5.2)	4.4 (3.9, 4.9)	0.817	4.3 (-4.4, 13.1)	4.4 (4.0, 4.9)	0.968	4.1 (3.3, 4.8)	4.6 (4.1, 5.1)	0.274
Safety	3.5 (2.0, 5.0)	4.2 (3.7, 4.6)	0.363	4 (3.2, 4.7)	4.2 (3.6, 4.8)	0.674	4 (1.5, 6.5)	4.1 (3.6, 4.6)	0.877	4 (3.3, 4.8)	4.2 (3.6, 4.8)	0.79
Spirituality	8.8 (7.1, 10.5)	8.1 (7.4, 8.8)	0.411	**9 (8.1, 9.8)**	**7.7 (6.9, 8.6)**	**0.045***	7 (-6.1, 20.1)	8.2 (7.6, 8.8)	0.734	7.3 (6.1, 8.5)	8.6 (7.8, 9.3)	0.088

Table G4 Symptoms and treatment efficacy (significant rank differences are highlighted bold)

HPVS value / factor considered	PSA screening case			Roaccutane treatment case			End-of-life management case			Botox treatment case		
	Yes N=97 (83.6%)	Nil N=19 (16.4%)	p-value	Yes N=55 (47.4%)	Nil N=61 (52.6%)	p-value	Yes N=48 (41.4%)	Nil N=68 (58.6%)	p-value	Yes N=28 (24.1%)	Nil N=88 (75.9%)	p-value
Altruism	4.7 (4.1 ,5.3)	3.7 (2.6, 4.9)	0.134	4.6 (3.8, 5.3)	4.5 (3.8, 5.2)	0.891	4.3 (3.4, 5.2)	4.7 (4.1, 5.3)	0.423	5 (3.6, 6.3)	4.4 (3.8, 4.9)	0.399
Authority	9.1 (8.7, 9.5)	9.6 (8.7, 10.5)	0.269	8.8 (8.3, 9.4)	9.4 (9.0, 9.9)	0.1	8.8 (8.3, 9.4)	9.4 (8.9, 9.8)	0.144	8.9 (8.2, 9.7)	9.1 (8.6, 9.6)	0.711
Capability	3.5 (3.0, 3.9)	4.3 (3.2, 5.4)	0.173	3.7 (3.0, 4.3)	3.5 (2.9, 4.2)	0.774	3.2 (2.5, 3.9)	3.9 (3.3, 4.4)	0.142	3.4 (2.6, 4.2)	3.7 (3.1, 4.2)	0.576
Critical thinking	5.1 (4.6, 5.6)	6.1 (4.9, 7.3)	0.119	5.3 (4.6, 6.0)	5.2 (4.6, 5.9)	0.866	5 (4.4, 5.7)	5.4 (4.8, 6.1)	0.414	4.8 (3.8, 5.7)	5.3 (4.8, 5.8)	0.338
Equality	5.6 (5.1, 6.1)	5.9 (4.5, 7.3)	0.697	5.9 (5.2, 6.6)	5.5 (4.9, 6.1)	0.43	5.6 (4.8 ,6.3)	5.7 (5.1, 6.3)	0.71	6.2 (5.3, 7.1)	5.5 (5.0, 6.1)	0.193
Intellectual stimulation	7.3 (6.8, 7.8)	8 (7.3, 8.7)	0.095	7.7 (7.2, 8.3)	7.1 (6.5, 7.7)	0.095	7.3 (6.7, 7.9)	7.5 (6.9, 8.0)	0.7	7.5 (6.5, 8.4)	7.3 (6.8, 7.8)	0.734
Morality	4.6 (4.2, 5.1)	4.6 (3.4, 5.9)	0.978	4.5 (3.9, 5.1)	4.8 (4.1, 5.5)	0.506	5.1 (4.4, 5.8)	4.3 (3.8, 4.9)	0.108	4.9 (4.0, 5.8)	4.5 (4.0, 5.0)	0.421
Pleasure	9 (8.6, 9.5)	9.4 (8.4, 10.4)	0.471	9.2 (8.6, 9.8)	9 (8.5, 9.5)	0.58	8.9 (8.3, 9.6)	9.2 (8.8, 9.7)	0.431	8.8 (7.9, 9.8)	9.1 (8.7, 9.6)	0.579
Professionalism	4.5 (4.0, 4.9)	4.2 (3.0, 5.3)	0.593	4.4 (3.8, 5.0)	4.4 (3.8, 5.1)	0.92	4.4 (3.7, 5.0)	4.5 (3.9, 5.1)	0.783	3.9 (3.1, 4.8)	4.5 (4.0, 5.0)	0.231
Safety	4.1 (3.6, 4.6)	4.2 (3.2, 5.3)	0.823	3.8 (3.3, 4.5)	4.3 (3.6, 5.0)	0.334	4.2 (3.5, 4.8)	4.1 (3.4, 4.7)	0.81	4.1 (3.3, 4.8)	4.1 (3.6, 4.7)	0.885
Spirituality	**8.6 (7.9, 9.2)**	**6 (4.0, 8.0)**	**0.016***	8 (7.0, 9.0)	8.3 (7.4, 9.1)	0.712	**9.3 (8.5, 10.1)**	**7.4 (6.5, 8.3)**	**0.002***	8.6 (7.3, 9.9)	7.9 (7.1, 8.7)	0.38

Table G5 Practitioner awareness (Significant rank differences are highlighted bold)

HPVS value / factor considered	PSA screening case			Roaccutane treatment case			End-of-life management case			Botox treatment case		
	Yes N=14 (12.1%)	Nil N=102 (87.9%)	p-value	Yes N=14 (12.1%)	Nil N=102 (87.9%)	p-value	Yes N=25 (21.6%)	Nil N=91 (78.4%)	p-value	Yes N=99 (85.3%)	Nil N=17 (14.7%)	p-value
Altruism	5.5 (3.6, 7.4)	4.4 (3.9, 4.9)	0.244	3.8 (2.0, 5.5)	4.6 (4.2, 5.2)	0.338	4.6 (3.4, 5.7)	4.5 (3.9, 5.1)	0.946	4.53 (4.0, 5.1)	4.4 (2.8, 6.0)	0.885
Authority	8.5 (7.4, 9.7)	9.2 (8.9, 9.6)	0.21	8.8 (7.7, 9.8)	9.2 (8.8, 9.6)	0.44	9.4 (8.8, 10.0)	9.1 (8.7, 9.5)	0.353	9.17 (8.8 ,9.6)	8.4 (7.2, 9.6)	0.189
Capability	4.2 (3.0, 5.5)	3.5 (3.0, 4.0)	0.268	4.6 (2.9, 6.4)	3.4 (3.0, 3.9)	0.176	3.4 (2.5, 4.3)	3.6 (3.1, 4.2)	0.65	3.5 (3.0, 4.0)	4.2 (2.7, 5.6)	0.357
Critical thinking	4.5 (3.4, 5.6)	5.4 (4.9, 5.9)	0.149	5.1 (3.5, 6.7)	5.3 (4.8, 5.8)	0.776	5.3 (4.3, 6.3)	5.3 (4.7, 5.8)	0.905	5.2 (4.7, 5.7)	4.9 (3.7, 6.0)	0.601
Equality	5.9 (4.6, 7.1)	5.6 (5.2, 6.1)	0.735	5 (3.9, 6.1)	5.8 (5.3 ,6.3)	0.193	6.1 (5.3, 7.0)	5.5 (5.0, 6.1)	0.249	5.7 (5.2, 6.2)	5.9 (4.5, 7.3)	0.753
Intellectual-stimulation	6.9 (5.6, 8.3)	7.5 (7.0, 7.9)	0.424	7.7 (6.4, 9.1)	7.4 (6.9, 7.8)	0.602	7.7 (6.8, 8.6)	7.3 (6.9, 7.8)	0.47	7.3 (6.8, 7.8)	7.6 (6.7, 8.5)	0.543
Morality	4.2 (2.6, 5.8)	4.7 (4.2, 5.2)	0.533	5.2 (4.0, 6.4)	4.6 (4.1, 5.1)	0.308	4.4 (3.5, 5.4)	4.7 (4.2, 5.2)	0.619	4.6 (4.2, 5.1)	4.2 (2.9, 5.6)	0.548
Pleasure	9.1 (7.9, 10.2)	9.1 (8.7, 9.5)	0.951	9.2 (8.2, 10.3)	9.1 (8.7, 9.5)	0.817	9.1 (8.4, 9.8)	9.1 (8.6, 9.6)	0.96	9.0 (8.5, 9.4)	9.6 (8.7, 10.5)	0.21
Professionalism	3.3 (1.9, 4.6)	4.6 (4.1, 5.0)	0.068	4.3 (2.7, 5.9)	4.4 (4.0, 4.9)	0.839	**3.4 (2.6, 4.2)**	**4.7 (4.2 ,5.2)**	**0.006***	4.3 (3.8, 4.7)	5 (3.7, 6.3)	0.286
Safety	4 (2.4, 5.6)	4.1 (3.6, 4.6)	0.881	4.1 (2.5, 5.8)	4.1 (3.6, 4.6)	0.956	3.6 (2.6, 4.6)	4.2 (3.7, 4.7)	0.287	4.1 (3.6, 4.6)	4.4 (3.2, 5.7)	0.603
Spirituality	**9.9 (8.8, 11.1)**	**7.9 (7.2, 8.6)**	**0.005***	8.1 (6.1, 10.2)	8.2 (7.5, 8.9)	0.981	8.9 (7.8, 10.1)	8 (7.2, 8.7)	0.163	8.2 (7.5, 8.9)	7.5 (5.4, 9.6)	0.504

Table G6 Service cost (Significant rank differences are highlighted bold)

HPVS value / factor considered	**PSA screening case**			**Roaccutane treatment case**			**End-of-life management case**			**Botox treatment case**		
	Yes N=22 (19.0%)	Nil N=94 (81.0%)	p-value	Yes N=12 (10.3%)	Nil N=104 (89.7%)	p-value	Yes N=27 (23.3%)	Nil N=89 (76.7%)	p-value	Yes N=24 (20.7%)	Nil N=92 (60.3%)	p-value
Altruism	4.8 (3.6, 6.1)	4.5 (3.9, 5.0)	0.591	4.8 (3.2, 6.5)	4.5 (3.9, 5.0)	0.67	5.2 (4.2, 6.2)	4.3 (3.7, 4.9)	0.135	4.6 (3.2, 6.0)	4.5 (3.9, 5.1)	0.872
Authority	9.3 (8.6, 10.0)	9.1 (8.7, 9.5)	0.699	8.4 (7.3, 9.5)	9.2 (8.9, 9.6)	0.149	**9.8 (9.4, 10.2)**	**9 (8.5, 9.4)**	**0.008***	8.4 (7.2, 9.6)	9.2 (8.8, 9.6)	0.174
Capability	3.3 (2.4, 4.2)	3.7 (3.2, 4.2)	0.454	3.5 (2.2, 4.8)	3.6 (3.1, 4.1)	0.881	3.2 (2.2, 4.1)	3.7 (3.2, 4.2)	0.278	**2.8 (2.1, 3.6)**	**3.8 (3.3, 4.3)**	**0.04***
Critical thinking	4.7 (3.6, 5.7)	5.4 (4.9, 5.9)	0.212	4.7 (3.2, 6.1)	5.3 (4.8, 5.8)	0.362	4.9 (4.0, 5.9)	5.4 (4.8, 5.9)	0.407	4.7 (3.8, 5.7)	5.3 (4.7, 5.8)	0.337
Equality	5 (4.1, 5.9)	5.8 (5.3, 6.3)	0.112	6.3 (4.5, 8.2)	5.6 (5.1, 6.1)	0.411	6.4 (5.6, 7.2)	5.5 (4.9, 6.0)	0.061	5.7 (4.8, 6.6)	5.7 (5.2, 6.2)	0.978
Intellectual stimulation	7.9 (7.2, 8.6)	7.3 (6.8, 7.8)	0.178	7.7 (6.4, 9.0)	7.4 (6.9, 7.8)	0.652	6.7 (5.7, 7.8)	7.6 (7.2, 8.0)	0.136	6.7 (5.6, 7.8)	7.5 (7.0, 8.0)	0.151
Morality	5.1 (4.0, 6.3)	4.5 (4.1, 5.0)	0.321	4.6 (2.8, 6.4)	4.7 (4.2, 5.1)	0.935	4.4 (3.5, 5.4)	4.7 (4.2, 5.2)	0.555	4.2 (3.1, 5.3)	4.7 (4.2, 5.2)	0.437
Pleasure	9.6 (9.1, 10.2)	9 (8.5, 9.4)	0.059	9.6 (8.8, 10.3)	9.1 (8.6, 9.5)	0.193	9.3 (8.3, 10.2)	9.1 (8.6, 9.5)	0.696	9 (8.0, 10.0)	9.1 (8.6, 9.5)	0.923
Professionalism	4.1 (3.3, 4.8)	4.5 (4.0, 5.0)	0.273	4.2 (2.8, 5.6)	4.5 (4.0, 4.9)	0.68	4.8 (3.9, 5.6)	4.3 (3.8, 4.8)	0.346	4.1 (3.0, 5.2)	4.5 (4.0, 4.9)	0.536
Safety	**3.1 (2.2, 4.0)**	**4.3 (3.8, 4.9)**	**0.017***	3.1 (1.9, 4.3)	4.2 (3.7, 4.7)	0.074	3.7 (2.8, 4.7)	4.2 (3.7, 4.7)	0.378	4.1 (2.7, 5.5)	4.1 (3.7, 4.6)	0.953
Spirituality	9.2 (7.9, 10.5)	7.9 (7.2, 8.7)	0.092	9.2 (7.1, 11.2)	8.1 (7.4, 8.7)	0.284	7.7 (6.3, 9.1)	8.3 (7.6, 9.1)	0.408	9.2 (8.0, 10.5)	7.8 (7.0, 8.6)	0.052

REFERENCES

ABIM Foundation, American Board of Internal Medicine. (2002). Medical professionalism in the new millennium: A physician charter. *Annals of Internal Medicine, 136*(3), 243.

Aguilar, A., Stupans, I., Scutter, S., & King, S. (2012). Exploring professionalism: The professional values of Australian occupational therapists. *Australian Occupational Therapy Journal, 59*(3), 209-217.

Ajjawi, R., & Higgs, J. (2008). Learning to reason: A journey of professional socialisation. *Advances in Health Sciences Education, 13*(2), 133-150.

Alfred, D., Yarbrough, S., Martin, P., & Garcia, C. (2011). Gender and professional values: A closer look. *Nursing Management, 42*(1), 34-36.

Altun, I. (2002). Burnout and nurses' personal and professional values. *Nursing Ethics, 9*(3), 269-278.

Altun, I. (2003). The perceived problem solving ability and values of student nurses and midwives. *Nurse Education Today, 23*(8), 575-584.

American Association of Colleges of Nursing. (1986). *Essentials of college and university education for professional nursing: Final report*. Washington, DC: American Association of Colleges of Nursing.

American Philosophical Association. (1990). *Critical thinking: A statement of expert consensus for purposes of educational assessment and instruction.* ERIC Doc. No. ED 315-423

Arnold, L. (2002). Assessing professional behavior: Yesterday, today, and tomorrow. *Academic Medicine, 77*(6), 502-515.

Bailin, S. (2002). Critical thinking and science education. *Science & Education, 11*(4), 361-375.

Bailin, S., Case, R., Coombs, J., & Daniels, L. (1999). Conceptualizing critical thinking. *Journal of Curriculum Studies, 31*(3), 285-302.

Bakr, M., Sherif, N., Eid, N., & ELshal, S. (2013). Factors influencing decision making and its effect on intern students clinical performance. *World Applied Programming, 3*(2), 75-84.

Balboni, M., Bandini, J., Mitchell, C., Epstein-Peterson, Z. D., Amobi, A., Cahill, J., Enzinger, A. C., Peteet, J., & Balboni, T. (2015). Religion, spirituality, and the hidden curriculum: Medical student and faculty reflections. *Journal of Pain & Symptom Management, 50*(4), 507-515.

Bang, K., Kang, J., Jun, M., Kim, H., Son, H., Yu, S., Kwon, M., & Kim, J. (2011). Professional values in Korean undergraduate nursing students. *Nurse Education Today, 31*(1), 72-75.

Beauchamp, T. L. (2007). The 'four principles' approach to health care ethics. In R. E. Ashcroft, A. Dawson, H. Draper, J. R. McMillan, & M. R. Tonelli (Eds.), *Principles of health care ethics* (2nd ed., pp. 3-10). Chisester, UK: John Wiley & Sons.

Becker, B. W., Kaldenberg, D. O., & Connor, P. E. (1996). Dentists' personal values: An exploratory investigation. *Journal of the American Dental Association, 127*(4), 503-509.

Beisecker, A. E. (1990). Patient power in doctor-patient communication: What do we know? *Health Communication, 2*(2), 105-122.

Bensing, J. (2000). Bridging the gap: The separate worlds of evidence-based medicine and patient-centered medicine. *Patient Education & Counseling, 39*(1), 17-25.

Bergman, M. M. (1998). A theoretical note on the differences between attitudes, opinions, and values. *Swiss Political Science Review, 4*(2), 81-93.

BMJ (2016). Learning from patient safety incidents**.** In *BMJ Learning***.** Retrieved 12 Dec 2016, from http://learning.bmj.com/learning/module-intro/.html?moduleId=10050076

Borgstrom, E., Cohn, S., & Barclay, S. (2010). Medical professionalism: Conflicting values for tomorrow's doctors. *Journal of General Internal Medicine, 25*(12), 1330-1336.

Braithwaite, V. A., & Law, H. (1985). Structure of human values: Testing the adequacy of the rokeach value survey. *Journal of Personality & Social Psychology, 49*(1), 250.

Brockett, R. G., & Hiemstra, R. (1991). Self-Direction in Adult Learning: Perspectives on Theory, Research, and Practice. *Routledge Series on Theory and Practice of Adult Education in North America.* New York: Routledge, Chapman and Hall, Inc.

Bruhn, J. G., & Henderson, G. (1991). *Values in health care: Choices and conflicts*. Springfield: Thomas Publisher.

Brunton, G., Oliver, S., Oliver, K., & Lorenc, T. (2006). *A synthesis of research addressing children's, young people's and parents' views of walking and cycling for transport*. London: EPPI-Centre, Social Science.

Bullock, K. (2011). The influence of culture on end-of-life decision making. *Journal of Social Work in End-of-life & Palliative care, 7*(1), 83-98.

Burgener, S. C. (1999). Predicting quality of life in caregivers of alzheimer's patients: The role of support from and involvement with the religious community. *Journal of Pastoral Care & Counseling, 53*(4), 433-446.

Burkhardt, M. A. (1989). Spirituality: An analysis of the concept. *Holistic Nursing Practice, 3*(3), 69-77.

Cadge, W., Ecklund, E. H., & Short, N. (2009). Religion and spirituality: A barrier and a bridge in the everyday professional work of pediatric physicians. *Social Problems, 56*(4), 702-721.

Campbell, M. J. (2006). *Statistics at square two: Understanding modern statistical applications in medicine*. Massachusetts: Blackwell Publishing.

Candy, P. C. (1991). *Self-Direction for Lifelong Learning. A Comprehensive Guide to Theory and Practice*. San Francisco: Jossey-Bass.

Carroll, C., Booth, A., & Cooper, K. (2011). A worked example of "best fit" framework synthesis: A systematic review of views concerning the taking of some potential chemopreventive agents. *BMC Medical Research Methodology, 11*(1), 9-39.

Catlin, E. A., Cadge, W., Ecklund, E. H., Gage, E. A., & Zollfrank, A. A. (2008). The spiritual and religious identities, beliefs, and practices of academic pediatricians in the united states. *Academic Medicine, 83*(12), 1146-1152.

Chiu, L., Emblen, J. D., Van Hofwegen, L., Sawatzky, R., & Meyerhoff, H. (2004). An integrative review of the concept of spirituality in the health sciences. *Western Journal of Nursing Research, 26*(4), 405-428.

Christianson, C. E., McBride, R. B., Vari, R. C., Olson, L., & Wilson, H. D. (2007). From traditional to patient-centered learning: Curriculum change as an intervention for changing institutional culture and promoting professionalism in undergraduate medical education. *Academic Medicine, 82*(11), 1079-1088.

Clark, P. G. (1997). Values in health care professional socialization: Implications for geriatric education in interdisciplinary teamwork. *The Gerontologist, 37*(4), 441-451.

Cohen, H. A. (1981). *The nurse's quest for a professional identity*: Addison-Wesley.

Cohen, S. R., Mount, B. M., Tomas, J. J., & Mount, L. F. (1996). Existential well-being is an important determinant of quality of life: Evidence from the mcgill quality of life questionnaire. *Cancer, 77*(3), 576-586.

Committee on Quality Health Care in America. (2001). *Report brief: Crossing the quality chasm*. Washington, DC: National Academy Press.

Congress, E. (1992). Ethical teaching of multicultural students: Reconsideration of social work values for educators. *Journal of Multicultural Social Work, 2*(2), 11-23.

Coulehan, J., & Williams, P. C. (2001). Vanquishing virtue: The impact of medical education. *Academic Medicine, 76*(6), 598-605.

Coulehan, J., & Williams, P. C. (2003). Conflicting professional values in medical education. *Cambridge Quarterly of Healthcare Ethics, 12*(01), 7-20.

Cruz, D. M., Pimenta, C. M., & Lunney, M. (2009). Improving critical thinking and clinical reasoning with a continuing education course. *Journal of Continuing Education in Nursing, 40*(3), 121.

Curlin, F. A., Lantos, J. D., Roach, C. J., Sellergren, S. A., & Chin, M. H. (2005). Religious characteristics of us physicians. *Journal of General Internal Medicine, 20*(7), 629-634.

de Jager Meezenbroek, E., Garssen, B., van den Berg, M., Van Dierendonck, D., Visser, A., & Schaufeli, W. B. (2012). Measuring spirituality as a universal human experience: A review of spirituality questionnaires. *Journal of Religion & Health, 51*(2), 336-354.

De Martino, B., Kumaran, D., Seymour, B., & Dolan, R. J. (2006). Frames, biases, and rational decision-making in the human brain. *Science, 313*(5787), 684-687.

Deber, R. B. (1994a). Physicians in health care management: 7. The patient-physician partnership: Changing roles and the desire for information. *Canadian Medical Association Journal, 151*(2), 171.

Deber, R. B. (1994b). Physicians in health care management: 8. The patient-physician partnership: Decision making, problem solving and the desire to participate. *Canadian Medical Association Journal, 151*(4), 423.

DeLisa, J. A., Foye, P. M., Jain, S. S., Kirshblum, S., & Christodoulou, C. (2001). Measuring professionalism in a physiatry residency training program. *American Journal of Physical Medicine & Rehabilitation, 80*(3), 225-229.

Diaz, J. A., & Stamp, M. J. (2004). Primer on medical professionalism. *Journal of the American Podiatric Medical Association, 94*(2), 206-209.

DiGiacomo, M. (2004). Professionalism: Values in action. *PT: Magazine of Physical Therapy, 12*(12), 44-47.

Dixon-Woods, M. (2011). Using framework-based synthesis for conducting reviews of qualitative studies. *BMC Medicine, 9*(1), 39.

Dose, J. J. (1997). Work values: An integrative framework and illustrative application to organizational socialization. *Journal of Occupational & Organizational Psychology, 70*(3), 219-240.

Dossetor, J. B. (1997). Human values in health care: Trying to get it right. *Canadian Medical Association Journal, 157*(12), 1689-1690.

Duchscher, J. E. B. (1999). Catching the wave: Understanding the concept of critical thinking. *Journal of Advanced Nursing, 29*(3), 577-583.

Duggan, P. S., Geller, G., Cooper, L. A., & Beach, M. C. (2006). The moral nature of patient-centeredness: Is it "just the right thing to do"? *Patient Education & Counseling, 62*(2), 271-276.

Dyson, J., Cobb, M., & Forman, D. (1997). The meaning of spirituality: A literature review. *Journal of Advanced Nursing, 26*(6), 1183-1188.

Eagly, A. H., & Chaiken, S. (1993). *The psychology of attitudes*. Fort Worth, TX: Harcourt Brace Jovanovich College Publishers.

Eberly College of Science. (2016). Lesson 6: Random Effects and Introduction to Mixed Models. In *STAT50: Analysis of Variance and Design of Experiments.* Retrieved 12 Dec 2016, from https://onlinecourses.science.psu.edu/stat502/node/164

Ecklund, E. H., Cadge, W., Gage, E. A., & Catlin, E. A. (2007). The religious and spiritual beliefs and practices of academic pediatric oncologists in the united states. *Journal of Pediatric Hematology/Oncology, 29*(11), 736-742.

Eddy, D. M., Elfrink, V., Weis, D., & Schank, M. J. (1994). Importance of professional nursing values: A national study of baccalaureate programs. *Journal of Nursing Education, 33*(6), 257-262.

Ehman, J. W., Ott, B. B., Short, T. H., Ciampa, R. C., & Hansen-Flaschen, J. (1999). Do patients want physicians to inquire about their spiritual or religious beliefs if they become gravely ill? *Archives of Internal Medicine, 159*(15), 1803-1806.

Elkins, D. N., Hedstrom, L. J., Hughes, L. L., Leaf, J. A., & Saunders, C. (1988). Toward a humanistic-phenomenological spirituality definition, description, and measurement. *Journal of Humanistic Psychology, 28*(4), 5-18.

Elston, R. (1975). On the correlation between correlations. *Biometrika, 62*(1), 133-140.

Engel, G. L. (1977). The need for a new medical model: A challenge for biomedicine. *Science, 196*(4286), 129-136.

Ennis, R. (1991). Critical thinking. *Teaching Philosophy, 14*(1), 5-24.

Epstein, R. M. (1999). Mindful practice. *The Journal of the American Medical Association, 282*(9), 833-839.

Evans, J. S. B. (2003). In two minds: Dual-process accounts of reasoning. *Trends in Cognitive Sciences, 7*(10), 454-459.

Evans, R. G. (2003). Patient centred medicine: Reason, emotion, and human spirit? Some philosophical reflections on being with patients. *Medical Humanities, 29*(1), 8-14.

Evans, S. C., Roberts, M. C., Keeley, J. W., Blossom, J. B., Amaro, C. M., Garcia, A. M., ... & Reed, G. M. (2015). Vignette methodologies for studying clinicians' decision-making: Validity, utility, and application in ICD-11 field studies. *International Journal of Clinical and Health Psychology*, *15*(2), 160-170.

Facione, N. C., & Facione, P. A. (1996). Externalizing the critical thinking in knowledge development and clinical judgment. *Nursing Outlook, 44*(3), 129-136.

Facione, N. C., Facione, P. A., & Sanchez, C. A. (1994). Critical thinking disposition as a measure of competent clinical judgment: The development of the california critical thinking disposition inventory. *Journal of Nursing Education, 33*(8), 345-350.

Facione, P. A. (1991). *Critical thinking: What it is and why it counts*. Millbrae, California: The California Academic Press.

Fagermoen, M. S. (1997). Professional identity: Values embedded in meaningful nursing practice. *Journal of Advanced Nursing, 25*(3), 434-441.

Fahrenwald, N. L., Bassett, S. D., Tschetter, L., Carson, P. P., White, L., & Winterboer, V. J. (2005). Teaching core nursing values. *Journal of Professional Nursing, 21*(1), 46-51.

Feather, N. (1988). Moral judgement and human values. *British Journal of Social Psychology, 27*(3), 239-246.

Fesler-Birch, D. M. (2005). Critical thinking and patient outcomes: A review. *Nursing Outlook, 53*(2), 59-65.

Fischer, R., & Schwartz, S. (2011). Whence differences in value priorities? Individual, cultural, or artifactual sources. *Journal of Cross-Cultural Psychology, 42*(7), 1127-1144.

Fisher, R. J. (1993). Social desirability bias and the validity of indirect questioning. *Journal of Consumer Research, 20*(2), 303-315.

Forman, E. N., & Ladd, R. E. (1989). Telling the truth in the face of medical uncertainty and disagreement. *The American Journal of Pediatric Hematology/Oncology, 11*(4), 463-466.

Fowkes, F. (1985). Doctors' knowledge of the costs of medical care. *Medical Education, 19*(2), 113-117.

Fowler, L. P. (1998). Improving critical thinking in nursing practice. *Journal for Nurses in Professional Development, 14*(4), 183-187.

Frankel, M. S. (1989). Professional codes: Why, how, and with what impact? *Journal of Business Ethics, 8*(2-3), 109-115.

Fulford, K. W. M., Caroll, H., & Peile, E. (2011). Values-based practice: Linking science with people. *Journal of Contemporary Psychotherapy, 41*(3), 145-156.

Gallagher, A. (2004). Dignity and respect for dignity - two key health professional values: Implications for nursing practice. *Nursing Ethics, 11*(6), 587-599.

Gartner, J., Harmatz, M., Hohmann, A., Larson, D., & Gartner, A. F. (1990). The effect of patient and clinician ideology on clinical judgment: A study of ideological countertransference. *Psychotherapy: Theory, Research, Practice, Training, 27*(1), 98.

Gehlenborg, N., & Wong, B. (2012). Points of view: Heat maps. *Nature Methods, 9*(3), 213-213.

Genia, V. (1991). The spiritual experience index: A measure of spiritual maturity. *Journal of Religion & Health, 30*(4), 337-347.

Gillon, R., & Lloyd, A. (Eds.). (1994). *Principles of health care ethics*. Chichester, UK: Wiley.

Glen, S. (1999). Educating for interprofessional collaboration: Teaching about values. *Nursing Ethics, 6*(3), 202-213.

Goslin, D. A., & Aldous, J. (1969). *Handbook of socialization theory and research*. Chicago: Rand McNally.

Gray, M., & Gibbons, J. (2007). There are no answers, only choices: Teaching ethical decision making in social work. *Australian Social Work, 60*(2), 228-238.

Greaves, D. (2002). Reflections on a new medical cosmology. *Journal of Medical Ethics, 28*(2), 81-85.

Gross, D. R., & Robinson, S. E. (1987). Ethics, violence, and counseling: Hear no evil, see no evil, speak no evil? *Journal of Counseling & Development, 65*(7), 340-344.

Guyatt, G. H., Cairns, J., Churchill, D., Cook, D., Haynes, B., Hirsh, J., Irvine, J., Levine, M., Levine, M., & Nishikawa, J. (1992). Evidence-based medicine: A new approach to teaching the practice of medicine. *The Journal of the American Medical Association 268*(17), 2420-2425.

Guyatt, G. H., Meade, M. O., Jaeschke, R. Z., Cook, D. J., & Haynes, R. B. (2000). Practitioners of evidence based care: Not all clinicians need to appraise evidence from scratch but all need some skills. *British Medical Journal, 320*(7240), 954-955.

Hagbaghery, M. A., Salsali, M., & Ahmadi, F. (2004). The factors facilitating and inhibiting effective clinical decision-making in nursing: A qualitative study. *BMC Nursing, 3*(1), 2.

Haidet, P., Dains, J. E., Paterniti, D. A., Hechtel, L., Chang, T., Tseng, E., & Rogers, J. C. (2002). Medical student attitudes toward the doctor–patient relationship. *Medical Education, 36*(6), 568-574.

Hall, P. (2005). Interprofessional teamwork: Professional cultures as barriers. *Journal of Interprofessional Care, 19*(S1), 188-196.

Hartung, P. J., Taber, B. J., & Richard, G. V. (2005). The physician values in practice scale: Construction and initial validation. *Journal of Vocational Behavior, 67*(2), 309-320.

Hartzband, P., & Groopman, J. (2009). Keeping the patient in the equation—humanism and health care reform. *New England Journal of Medicine, 361*(6), 554-555.

Haynes, R. B., Sackett, D. L., Gray, J. M., Cook, D. L., & Guyatt, G. H. (1997). Transferring evidence from research into practice: 2. Getting the evidence straight. *Evidence Based Medicine, 2*(1), 4-6.

Heelas, P., Woodhead, L., Seel, B., Tusting, K., & Szerszynski, B. (2005). *The spiritual revolution: Why religion is giving way to spirituality*. Massachusetts: Blackwell Publishing.

Helkama, K. (1983). The development of moral reasoning and moral values. *Acta Psychologica Fennica, 9*, 99-111.

Helkama, K., Uutela, A., Pohjanheimo, E., Salminen, S., Koponen, A., & Rantanen-VA¨ NTSI, L. (2003). Moral reasoning and values in medical school: A longitudinal study in finland. *Scandinavian Journal of Educational Research, 47*(4), 399-411.

Heppner, P. P., & Petersen, C. H. (1982). The development and implications of a personal problem-solving inventory. *Journal of Counseling Psychology, 29*(1), 66.

Hofstede, G. (1998). Attitudes, values and organizational culture: Disentangling the concepts. *Organization Studies, 19*(3), 477-493.

Hosmer, L. T. (1994). Strategic planning as if ethics mattered. *Strategic Management Journal, 15*(S2), 17-34.

Hoyuelos, S. B., Fraile, C. L., Weis, D., Urien, E. L., Elsden, C. A., & Schank, M. J. (2010). Nursing professional values: Validation of a scale in a spanish context. *Nurse Education Today, 30*(2), 107-112.

Huitt, W. (1992). Problem solving and decision making: Consideration of individual differences using the myers-briggs type indicator. *Journal of Psychological Type, 24*(1), 33-44.

Hussey, T. (1996). Nursing ethics and codes of professional conduct. *Nursing Ethics, 3*(3), 250-258.

Kahlke, R., & White, J. (2013). Critical thinking in health sciences education: Considering "three waves". *Creative Education, 4*(12), 21.

Kahneman, D. (2002). Representativeness revisited: Attribute substitution in intuitive judgment. In T. Gilovich, D. Griffin, & D. Kahneman (Eds.), *Heuristics and biases: The psychology of intuitive judgment* (pp. 49-81). Cambridge: Cambridge University Press.

Karel, M. J. (2000). The assessment of values in medical decision making. *Journal of Aging Studies, 14*(4), 403-422.

Kelly, B. (1991). The professional values of english nursing undergraduates. *Journal of Advanced Nursing, 16*(7), 867-872.

Kenny, N. P., Mann, K. V., & MacLeod, H. (2003). Role modeling in physicians' professional formation: Reconsidering an essential but untapped educational strategy. *Academic Medicine, 78*(12), 1203-1210.

Kinghorn, W. A., McEvoy, M. D., Michel, A., & Balboni, M. (2007). Viewpoint: Professionalism in modern medicine: Does the emperor have any clothes? *Academic Medicine, 82*(1), 40-45.

Kirkevold, M. (1992). Balance values and norms in the nursing care of stroke patients. *Rehabilitation Nursing Research, 1*(1), 24-33.

Kluckhohn, F. R., & Strodtbeck, F. L. (1951). Values and value-orientations in the theory of action: An exploration in definition and classification. In T. Parsons & E. Shils (Eds.), *Toward a general theory of action*. Cambridge, MA: Harvard University Press.

Laine, C., & Davidoff, F. (1996). Patient-centered medicine. A professional evolution. *The Journal of the American Medical Association 275*(2), 152-156.

Langille, A. D., Catano, V. M., Boran, T. L., & Cunningham, D. P. (2010). The dental values scale: Development and validation. *Journal of Dental Education, 74*(12), 1282-1293.

Lee, J. A., Soutar, G., & Louviere, J. (2008). The best–worst scaling approach: an alternative to Schwartz's values survey. *Journal of Personality Assessment*, *90*(4), 335-347.

Leners, D. W., Roehrs, C., & Piccone, A. V. (2006). Tracking the development of professional values in undergraduate nursing students. *Journal of Nursing Education, 45*(12), 504-511.

Lesser, C. S., Lucey, C. R., Egener, B., Braddock, C. H., Linas, S. L., & Levinson, W. (2010). A behavioral and systems view of professionalism. *The Journal of the American Medical Association, 304*(24), 2732-2737.

Leung, W.-C. (2001). How to design a questionnaire. *Student BMJ, 9*(11), 187-189.

Levine, M. N., Gafni, A., Markham, B., & MacFarlane, D. (1992). A bedside decision instrument to elicit a patient's preference concerning adjuvant chemotherapy for breast cancer. *Annals of Internal Medicine, 117*(1), 53-58.

Levy, C. S. (1976). Personal versus professional values: The practitioner's dilemmas. *Clinical Social Work Journal, 4*(2), 110-120.

Lin, Y., & Wang, L. S. (2010). A chinese version of the revised nurses professional values scale: Reliability and validity assessment. *Nurse Education Today, 30*(6), 492-498.

Lin, Y., Wang, L. S., Yarbrough, S., Alfred, D., & Martin, P. (2010). Changes in taiwanese nursing student values during the educational experience. *Nursing Ethics, 17*(5), 646-654.

Lipman, M. (1987). Critical thinking: What can it be? *Analytic Teaching, 8*(1).

Little, J. M. (2002). Humanistic medicine or values-based medicine... What's in a name? *Medical Journal of Australia, 177*(6), 319-322.

Logan, R., & Scott, P. (1996). Uncertainty in clinical practice: Implications for quality and costs of health care. *The Lancet, 347*(9001), 595-598.

Loma Linda University (2016). Alternative Online Self-directed Learning. In *Physician Lounge.* Retrieved 12 Dec 2016, from http://www.lluphysicianlounge.com/alternative-online-self-direct

Lucchetti, G., Lucchetti, A. L. G., & Puchalski, C. (2012). Spirituality in medical education: Global reality? *Journal of Religion & Health, 51*(1), 3-19.

Lui, M. H. L., Lam, L. W., Lee, I. F. K., Chien, W. T., Chau, J. P. C., & Ip, W. Y. (2008). Professional nursing values among baccalaureate nursing students in hong kong. *Nurse Education Today, 28*(1), 108-114.

Lunney, M. (2003). Critical thinking and accuracy of nurses' diagnoses. *International Journal of Nursing Terminologies & Classifications, 14*(3), 96-107.

Lynch, D. C., Surdyk, P. M., & Eiser, A. R. (2004). Assessing professionalism: A review of the literature. *Medical Teacher, 26*(4), 366-373.

Mann, J. R., & Larimore, W. (2006). Impact of religious attendance on life expectancy. *The Journal of the American Board of Family Medicine, 19*(4), 429-430.

Markakis, K. M., Beckman, H. B., Suchman, A. L., & Frankel, R. M. (2000). The path to professionalism: Cultivating humanistic values and attitudes in residency training. *Academic Medicine, 75*(2), 141-150.

Martin, P., Yarbrough, S., & Alfred, D. (2003). Professional values held by baccalaureate and associate degree nursing students. *Journal of Nursing Scholarship, 35*(3), 291-296.

McCabe, D. L., Dukerich, J. M., & Dutton, J. E. (1992). Values and ethical decision-making among professional school students: A study of dental and medical students. *Professional Ethics, 1*(3/4), 117-136.

McGhee, P. (2015). *The role of spirituality in ethical decision-making and behaviour and the benefits to organisations : A critical realist analysis (unpublished doctoral thesis).* University of Auckland, Auckland, New Zealand.

McGhee, P., & Grant, P. (2008). Spirituality and ethical behaviour in the workplace: Wishful thinking or authentic reality. *Electronic Journal of Business Ethics & Organization Studies, 13*(2).

McKee, D. D., & Chappel, J. N. (1992). Spirituality and medical practice. *The Journal of Family Practice, 35*(2), 205-208.

McNair, R. P. (2005). The case for educating health care students in professionalism as the core content of interprofessional education. *Medical Education, 39*(5), 456-464.

Meglino, B. M., & Ravlin, E. C. (1998). Individual values in organizations: Concepts, controversies, and research. *Journal of Management, 24*(3), 351-389.

Michael, S. Y., Luckhaupt, S. E., Mrus, J. M., Mueller, C. V., Peterman, A. H., Puchalski, C. M., & Tsevat, J. (2006). Religion, spirituality, and depressive symptoms in primary care house officers. *Ambulatory Pediatrics, 6*(2), 84-90.

Miles, A. (2012). Person-centered medicine-at the intersection of science, ethics and humanism. *International Journal of Person Centered Medicine, 2*(3), 329-333.

Miles, A., & Loughlin, M. (2011). Models in the balance: Evidence-based medicine versus evidence-informed individualized care. *Journal of Evaluation in Clinical Practice, 17*(4), 531-536.

Miles, A., & Mezzich, J. (2011). The care of the patient and the soul of the clinic: Person-centered medicine as an emergent model of modern clinical practice. *International Journal of Person Centered Medicine, 1*(2), 207-222.

Moher, D., Liberati, A., Tetzlaff, J., & Altman, D. G. (2009). Preferred reporting items for systematic reviews and meta-analyses: The prisma statement. *Annals of Internal Medicine, 151*(4), 264-269.

Monroe, M. H., Bynum, D., Susi, B., Phifer, N., Schultz, L., Franco, M., MacLean, C. D., Cykert, S., & Garrett, J. (2003). Primary care physician preferences regarding spiritual behavior in medical practice. *Archives of Internal Medicine, 163*(22), 2751-2756.

Moore, S. M. (2000). Telehealth. A challenge to preserve nursing values. *Nursing Leadership Forum, 5*(2), 41-42.

Morgan, S., & Yoder, L. H. (2012). A concept analysis of person-centered care. *Journal of Holistic Nursing, 30*(1), 6-15.

Moyo, M., Goodyear-Smith, F. A., Weller, J., Robb, G., & Shulruf, B. (2016). Healthcare practitioners' personal and professional values. *Advances in Health Sciences Education, 21*(2), 257-286.

Moyo, M., Goodyear-Smith, F. A., Weller, J., & Shulruf, B. (2016a). The impact of medical students' values on their clinical decision-making. *Perspectives on Medical Education*, *[Manuscript under review]*.

Moyo, M., Goodyear-Smith, F. A., Weller, J., & Shulruf, B. (2016b). An instrument for healthcare practitioners' personal and professional values. *Evaluation & the Health Professions*, *[Manuscript under review]*.

Murry Jr, J. W., & Hammons, J. O. (1995). Delphi: A versatile methodology for conducting qualitative research. *Review of Higher Education, 18*(4), 423-436.

Mykhalovskiy, E., & Weir, L. (2004). The problem of evidence-based medicine: Directions for social science. *Social Science & Medicine, 59*(5), 1059-1069.

Norman, G. (2005). Research in clinical reasoning: Past history and current trends. *Medical Education, 39*(4), 418-427.

O'Connor, A. M., Fiset, V., DeGrasse, C., Graham, I. D., Evans, W., Stacey, D., Laupacis, A., & Tugwell, P. (1999). Decision aids for patients considering options affecting cancer outcomes: Evidence of efficacy and policy implications. *JNCI Monographs, 1999*(25), 67-80.

O'Connor, A. M., Llewellyn-Thomas, H. A., & Flood, A. B. (2004). Modifying unwarranted variations in health care: Shared decision making using patient decision aids. *Health Affairs (Millwood)*, VAR 63-72.

Oliver, S. R., Rees, R. W., Clarke-Jones, L., Milne, R., Oakley, A. R., Gabbay, J., Stein, K., Buchanan, P., & Gyte, G. (2008). A multidimensional conceptual framework for analysing public involvement in health services research. *Health Expectations, 11*(1), 72-84.

Oskamp, S. (2005). *Attitudes and opinions* (3rd ed.). Mahwah, N.J.: L. Erlbaum Associates.

Panda, S. (2006). Medicine: Science or art? *Mens Sana Monographs, 4*(1), 127-138.

Pang, D., Senaratana, W., Kunaviktikul, W., Klunklin, A., & McElmurry, B. J. (2009). Nursing values in china: The expectations of registered nurses. *Nursing & Health Sciences, 11*(3), 312-317.

Parsell, G., Spalding, R., & Bligh, J. (1998). Shared goals, shared learning: Evaluation of a multiprofessional course for undergraduate students. *Medical Education, 32*(3), 304-311.

Paterson, R. (2012). *The good doctor: What patients want*. Auckland, New Zealand: Auckland University Press.

Paul, R. (1992). Critical thinking: What, why, and how. *New Directions for Community Colleges, 1992*(77), 3-24.

Pawlikowski, J., Sak, J. J., & Marczewski, K. (2012). Physicians' religiosity and attitudes towards patients. *Annals of Agricultural & Environmental Medicine, 19*(3).

Pellegrino, E. D. (2001). The internal morality of clinical medicine: A paradigm for the ethics of the helping and healing professions. *Journal of Medicine & Philosophy, 26*(6), 559-579.

Peloquin, S. M. (2007). A reconsideration of occupational therapy's core values. *The American Journal of Occupational Therapy, 61*(4), 474-478.

Pendleton, D., & King, J. (2002). Values and leadership. *British Medical Journal, 325*(7376), 1352.

Pinheiro, J., & Bates, D. (2006). *Mixed-effects models in S and S-PLUS*. Berlin: Springer Science & Business Media.

Pipes, R. B., Holstein, J. E., & Aguirre, M. G. (2005). Examining the personal-professional distinction: Ethics codes and the difficulty of drawing a boundary. *American Psychologist, 60*(4), 325.

Pohjanheimo, E. (1988). Moral reasoning and moral values. *Acta Psychologica Fennica, 10*, 66–67.

Pope, K. S., & Bajt, T. R. (1988). When laws and values conflict: A dilemma for psychologists. *American Psychologist, 43*(10), 828.

Post, S. G. (2011). Compassionate care enhancement: Benefits and outcomes. *International Journal of Person Centered Medicine, 1*(4), 808-813.

Profetto-McGrath, J. (2005). Critical thinking and evidence-based practice. *Journal of Professional Nursing, 21*(6), 364-371.

Protheroe, J., Fahey, T., Montgomery, A. A., Peters, T. J., & Smeeth, L. (2000). The impact of patients' preferences on the treatment of atrial fibrillation: Observational study of

patient based decision analysiscommentary: Patients, preferences, and evidence. *British Medical Journal, 320*(7246), 1380-1384.

Puchalski, C. (2006). Spirituality and medicine: Curricula in medical education. *Journal of Cancer Education, 21*(1), 14-18.

Puchalski, C. (2009). Ethical concerns and boundaries in spirituality and health. *Virtual Mentor, 11*, 804-806.

Puchalski, C. (2010). The spiritual history: An essential element of patient-centred care. In W. McSherry & L. Ross (Eds.), *Spiritual assessment in healthcare practice* (pp. 79-93). Keswick, England: M&K Update Ltd.

Puchalski, C., Blatt, B., Kogan, M., & Butler, A. (2014). Spirituality and health: The development of a field. *Academic Medicine, 89*(1), 10-16.

Puchalski, C., Ferrell, B., Virani, R., Otis-Green, S., Baird, P., Bull, J., Chochinov, H., Handzo, G., Nelson-Becker, H., & Prince-Paul, M. (2009). Improving the quality of spiritual care as a dimension of palliative care: The report of the consensus conference. *Journal of Palliative Medicine, 12*(10), 885-904.

Puchalski, C., Lunsford, B., Harris, M. H., & Miller, R. T. (2006). Interdisciplinary spiritual care for seriously ill and dying patients: A collaborative model. *The Cancer Journal, 12*(5), 398-416.

R Development Core Team. (2014). R: A language and environment for statistical computing. Vienna, Austria: R Foundation for Statistical Computing.

Raatikainen, R. (1989). Values and ethical principles in nursing. *Journal of Advanced Nursing, 14*(2), 92-96.

Rabow, M. W., Remen, R. N., Parmelee, D. X., & Inui, T. S. (2010). Professional formation: Extending medicine's lineage of service into the next century. *Academic Medicine, 85*(2), 310-317.

Ramondetta, L., Brown, A., Richardson, G., Urbauer, D., Thaker, P. H., Koenig, H. G., Gano, J. B., & Sun, C. (2011). Religious and spiritual beliefs of gynecologic oncologists may influence medical decision making. *International Journal of Gynecological Cancer, 21*(3), 573.

Rassin, M. (2008). Nurses' professional and personal values. *Nursing Ethics, 15*(5), 614-630.

Rassin, M. (2010). Values grading among nursing students - differences between the ethnic groups. *Nurse Education Today, 30*(5), 458-463.

Rhodes, M. K., Morris, A. H., & Lazenby, R. B. (2011). Nursing at its best: Competent and caring. *Online Journal of Issues in Nursing, 16*(2).

Robins, L. S., Braddock, C. H., & Fryer-Edwards, K. A. (2002). Using the american board of internal medicine's "elements of professionalism" for undergraduate ethics education. *Academic Medicine, 77*(6), 523-531.

Roe, R. A., & Ester, P. (1999). Values and work: Empirical findings and theoretical perspective. *Applied Psychology, 48*(1), 1-21.

Rohan, M. J. (2000). A rose by any name? The values construct. *Personality & Social Psychology Review, 4*(3), 255-277.

Rokeach, M. (1968). The role of values in public opinion research. *Public Opinion Quarterly, 32*(4), 547-559.

Rokeach, M. (1973). *The nature of human values*. New York: Free Press.

Rosenbaum, J. R., Bradley, E. H., Holmboe, E. S., Farrell, M. H., & Krumholz, H. M. (2004). Sources of ethical conflict in medical housestaff training: A qualitative study. *The American Journal of Medicine, 116*(6), 402-407.

Rowley, B. D., Baldwin Jr, D. C., Bay, R. C., & Karpman, R. R. (2000). Professionalism and professional values in orthopaedics. *Clinical Orthopaedics & Related Research, 378*, 90-96.

Rushton, C. H. (2005). A framework for integrated pediatric palliative care: being with dying. *Journal of Pediatric Nursing*, *20*(5), 311-325.

Savulescu, J. (2011). Should doctors feel able to practise according to their personal values and beliefs? - no. *Medical Journal of Australia, 195*(9), 497.

Schank, M. J., & Weis, D. (1989). A study of values of baccalaureate nursing students and graduate nurses from a secular and a nonsecular program. *Journal of Professional Nursing, 5*(1), 17-22.

Scheurich, N. (2003). Reconsidering spirituality and medicine. *Academic Medicine, 78*(4), 356-360.

Schwartz, K., Deschere, B., & Jinping, X. (2005). Screening for prostate cancer: Who and how often? Better use could be made of the psa assay, and less frequent testing may not jeopardize patients' outcomes. *Journal of Family Practice, 54*(7), 586-596.

Schwartz, S. H. (1992). Universals in the content and structure of values: Theoretical advances and empirical tests in 20 countries. *Advances in Experimental Social Psychology, 25*(1), 1-65.

Schwartz, S. H. (1994). Are there universal aspects in the structure and contents of human values? *Journal of Social Issues, 50*(4), 19-45.

Schwartz, S. H. (1996). Value priorities and behavior: Applying a theory of integrated value systems. In C. Seligman, J. M. Olso, & M. P. Zanna (Eds.), *The psychology of values: The ontario symposium, volume 8*. Hillsdale, NJ: Lawrence Erlbaum.

Schwartz, S. H. (1999). A theory of cultural values and some implications for work. *Applied Psychology, 48*(1), 23-47.

Schwartz, S. H., & Boehnke, K. (2004). Evaluating the structure of human values with confirmatory factor analysis. *Journal of Research in Personality*, *38*(3), 230-255.

Schwartz, S. H. (2012). An overview of the schwartz theory of basic values. *Online Readings in Psychology & Culture, 2*(1), 11.

Schwartz, S. H. (2012). An overview of the schwartz theory of basic values. *Online Readings in Psychology & Culture, 2*(1), 11.

Schwartz, S. H., Melech, G., Lehmann, A., Burgess, S., Harris, M., & Owens, V. (2001). Extending the cross-cultural validity of the theory of basic human values with a different method of measurement. *Journal of Cross-cultural Psychology, 32*(5), 519-542.

Schwartz, S. H., & Sagiv, L. (1995). Identifying culture-specifics in the content and structure of values. *Journal of Cross-cultural Psychology, 26*(1), 92-116.

Seedhouse, D. (2002). Commitment to health: A shared ethical bond between professions. *Journal of Interprofessional Care, 16*(3), 249-260.

Self-direction (2016). In *Vocabulary.com*. Retrieved 12 Dec 2016, from https://www.vocabulary.com/dictionary/self-direction

Sellin, S. C. (1995). Out on a limb: A qualitative study of patient advocacy in institutional nursing. *Nursing Ethics, 2*(1), 19-29.

Shahriari, M., Mohammadi, E., Abbaszadeh, A., Bahrami, M., & Fooladi, M. M. (2012). Perceived ethical values by iranian nurses. *Nursing Ethics, 19*(1), 30-44.

Shaw, H. K., & Degazon, C. (2008). Integrating the core professional values of nursing: A profession, not just a career. *Journal of Cultural Diversity, 15*(1), 44-50.

Sheldrake, P. (2010). Spirituality and healthcare. *Practical Theology, 3*(3), 367-379.

Shin, K. R. (1998). Critical thinking ability and clinical decision-making skills among senior nursing students in associate and baccalaureate programmes in korea. *Journal of Advanced Nursing, 27*(2), 414-418.

Shinyashiki, G. T., Mendes, I. A. C., Trevizan, M. A., & Day, R. A. (2006). Professional socialization: Students becoming nurses. *Revista Latino-Americana de Enfermagem (RLAE), 14*(4), 601-607.

Shojania, K. G., Duncan, B. W., McDonald, K. M., Wachter, R. M., & Markowitz, A. J. (2001). Making health care safer: a critical analysis of patient safety practices. *Evid Rep Technol Assess (Summ)*, *43*(1), 668.

Simpson, E., & Courtney, M. D. (2002). Critical thinking in nursing education: Literature review. *International Journal of Nursing Practice, 8*(April), 89-98.

Sine, D. M., & Northcutt, N. (2008). A qualitative analysis of the central values of professional paramedics. *American Journal of Disaster Medicine, 3*(6), 335-343.

Smith, M., Higgs, J., & Ellis, E. (2008). Factors influencing clinical decision making. In J. Higgs & M. Jones (Eds.), *Clinical reasoning in the health professions* (pp. 89-100). Oxford: Butterworth-Heinemann.

Smith, T. S., McGuire, J. M., Abbott, D. W., & Blau, B. I. (1991). Clinical ethical decision making: An investigation of the rationales used to justify doing less than one believes one should. *Professional Psychology: Research & Practice, 22*(3), 235.

Steiger, J. H. (1980). Tests for comparing elements of a correlation matrix. *Psychological Bulletin, 87*(2), 245.

Stern, D. T. (1996). Values on call: A method for assessing the teaching of professionalism. *Academic Medicine, 71*(10 Suppl), S37-39.

Swick, H. M. (2000). Toward a normative definition of medical professionalism. *Academic Medicine, 75*(6), 612-616.

Teal, C. R., & Street, R. L. (2009). Critical elements of culturally competent communication in the medical encounter: A review and model. *Social Science & Medicine, 68*(3), 533-543.

Thayer-Bacon, B. J. (1993). Caring and its relationship to critical thinking. *Educational Theory, 43*(3), 323-340.

Thomas, D. R. (2006). A general inductive approach for analyzing qualitative evaluation data. *American Journal of Evaluation, 27*(2), 237-246.

Thurston, H. I., Flood, M. A., Shupe, I. S., & Gerald, K. B. (1989). Values held by nursing faculty and students in a university setting. *Journal of Professional Nursing, 5*(4), 199-207.

Tilburt, J. C., James, K. M., Jenkins, S. M., Antiel, R. M., Curlin, F. A., & Rasinski, K. A. (2013). "Righteous minds" in health care: Measurement and explanatory value of social intuitionism in accounting for the moral judgments in a sample of us physicians. *PLoS ONE, 8*(9), e73379.

Toit, D. (1995). A sociological analysis of the extent and influence of professional socialization on the development of a nursing identity among nursing students at two universities in brisbane, australia. *Journal of Advanced Nursing, 21*(1), 164-171.

Tompkins, E. S. (1992). Nurse/client values congruence. *Western Journal of Nursing Research, 14*(2), 225-236.

Tong, A., Howard, K., Jan, S., Cass, A., Rose, J., Chadban, S., Allen, R. D., & Craig, J. C. (2010). Community preferences for the allocation of solid organs for transplantation: A systematic review. *Transplantation, 89*(7), 796-805.

Touchstone, M. (2010a). Professional development. Part 5: Core humanistic values. *EMS Magazine, 39*(5), 29-30.

Touchstone, M. (2010b). Professional development. Part 6: Core humanistic values, part 2. *EMS Magazine, 39*(6), 27-28.

Tsimtsiou, Z., Kerasidou, O., Efstathiou, N., Papaharitou, S., Hatzimouratidis, K., & Hatzichristou, D. (2007). Medical students' attitudes toward patient-centred care: A longitudinal survey. *Medical Education, 41*(2), 146-153.

Tversky, A., & Kahneman, D. (1981). The framing of decisions and the psychology of choice. *Science, 211*(4481), 453-458.

Tversky, A., & Kahneman, D. (1986). Rational choice and the framing of decisions. *Journal of Business*, S251-S278.

Underwood, L. G., & Teresi, J. A. (2002). The daily spiritual experience scale: Development, theoretical description, reliability, exploratory factor analysis, and preliminary construct validity using health-related data. *Annals of Behavioral Medicine, 24*(1), 22-33.

Valdés, L. S., Prilleltensky, I., Walsh-Bowers, R., & Rossiter, A. (2002). Applied ethics in mental health in cuba: Part i -- guiding concepts and values. *Ethics & Behavior, 12*(3), 223-242.

Van De Camp, K., Vernooij-Dassen, M. J., Grol, R. P., & Bottema, B. J. (2004). How to conceptualize professionalism: A qualitative study. *Medical Teacher, 26*(8), 696-702.

Vezeau, T. M. (2006). Teaching professional values in a bsn program. *International Journal of Nursing Education Scholarship, 3*(1), 1-15.

Vitell, S. J., Nwachukwu, S. L., & Barnes, J. H. (1993). The effects of culture on ethical decision-making: An application of hofstede's typology. *Journal of Business Ethics, 12*(10), 753-760.

Voltmer, E., Büssing, A., Koenig, H. G., & Al Zaben, F. (2014). Religiosity/spirituality of german doctors in private practice and likelihood of addressing r/s issues with patients. *Journal of Religion & Health, 53*(6), 1741-1752.

Wahlqvist, M., Gunnarsson, R. K., Dahlgren, G., & Nordgren, S. (2010). Patient-centred attitudes among medical students: Gender and work experience in health care make a difference. *Medical Teacher, 32*(4), e191-e198.

Watson, G. (1980). *Watson-Glaser Critical Thinking Appraisal*. San Antonio, TX: The Psychological Corporation.

Weber, E., & Hsee, C. (2000). Culture and individual judgment and decision making. *Applied Psychology, 49*(1), 32-61.

Weis, D., & Schank, M. J. (1997). Toward building an international consensus in professional values. *Nurse Education Today, 17*(5), 366-369.

Weis, D., & Schank, M. J. (2000). An instrument to measure professional nursing values. *Journal of Nursing Scholarship, 32*(2), 201-204.

Weis, D., & Schank, M. J. (2009). Development and psychometric evaluation of the nurses professional values scale--revised [corrected] [published erratum appears in j nurs meas 2010;18(1):70-2]. *Journal of Nursing Measurement, 17*(3), 221-231.

Weis, D., Schank, M. J., Eddy, D., & Elfrink, V. (1993). Professional values in baccalaureate nursing education. *Journal of Professional Nursing, 9*(6), 336-342.

Wood, M. (2004). Statistical inference using bootstrap confidence intervals. *Significance, 1*(4), 180-182.

Wright, S. M., & Carrese, J. A. (2001). Which values do attending physicians try to pass on to house officers? *Medical Education, 35*(10), 941-945.

Wynia, M. K., Papadakis, M. A., Sullivan, W. M., & Hafferty, F. W. (2014). More than a list of values and desired behaviors: A foundational understanding of medical professionalism. *Academic Medicine, 89*(5), 712-714.

Young, F. W. (1985). Multidimensional scaling. In S. Kotz & N. L. Johnson (Eds.), *Encyclopedia of Statistical Sciences* (Vol. 5, pp. 649-659). New York: Wiley.

Young, F. W. (2013). *Multidimensional scaling: History, theory, and applications*. Hove, UK: Psychology Press.

Younger, B., Hunt, E. H., Robinson, C., & McLemore, C. (1992). Impact of a shielded safety syringe on needlestick injuries among healthcare workers. *Infection Control and Hospital Epidemiology*, 349-353.

Yousuf, M. I. (2007). Using experts' opinions through delphi technique. *Practical Assessment, Research & Evaluation, 12*(4), 1-8.

Zinnbauer, B. J., Pargament, K. I., & Scott, A. B. (1999). The emerging meanings of religiousness and spirituality: Problems and prospects. *Journal of Personality, 67*(6), 889-919.