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Physical Activity and Mental Health in Young Adult Males

Greetings from Auckland, New Zealand. I wish to acknowledge the significant contributions of my colleagues Jessebel Chan Swee Boon and Lynley Bradnam.

Slide 2: The relationship between exercise/physical activity and mental health has received considerable attention from researchers in both health and sporting domains. Public belief suggests mental health benefits positively from participation in physical activity/exercise yet empirical support for this belief is less clear. A recent Cochrane review by Cooney and colleagues in 2013 assessed the effectiveness of exercise in treating depression as mixed.

New Zealand is reported to have one of the highest suicide rates in the world (13.93 per 100,000 in 2018-2019). Suicide rates in young adult males (15 – 24) is higher and of concern. This presentation reports the outcomes of an exploratory study of the relationship between physical activity and mental health in a small sample of young adult males. The study planned to include two groups, one with no reported health issues; a second taking prescribed medication for depression. Recruitment of participants in this group proved challenging and only two volunteers participated. Consequently the main question for this study changed from assessing the differences between non-medicated (no reported health issues) and medicated young adult males to investigating the relationship between self-report and objective measures of daily physical activity, and mental health.

Mental health and physical activity were assessed with the Beck Depression Inventory (BDI), the Short Form-36 Health Survey (SF-36), and International Physical Activity Questionnaire (IPAQ) delivered in random order. Participants completed a diary of their physical activities twice a day and wore an activity tracker (GeneActive) 24/7 for one week. The activity tracker used accelerometers to measure activity recorded at 100 Hz. The daily record (cut-off points) for sedentary, light, moderate and vigorous activity is shown in the table at the bottom of this slide.

Slide 3: This table shows demographic data and the results for the mental health and physical activity assessments. Data for the non-medicated group are in the top section of the table and for the 2

participants in the medicated group in the lower section along with average results for each group. One participant in the non-medicated group returned a BDI score indicating "borderline clinical depression" and with their consent was referred to an appropriate health professional for follow up. This individual also returned the lowest score on the SF-36 Mental test and the scored second lowest on total physical activity measured by the IPAQ.

Slide 4: The upper figure shows the very low correlation between total amount of physical activity recorded by the activity tracker and level of depression measured by the Beck Depression Inventory (BDI) for all participants. Note, BDI scores were strongly correlated with Short-Form-36 (mental) scores ($r = -.87$). Note too the substantial variability in physical activity level within a narrow (0-8) range of the BDI (range 0-40) and among three participants whose BDI scores were greater than 12 (13-17).

The lower figure illustrates the consistency of difference between the activity diary (subjective or perceptual) and activity tracker (objective) across all non-medicated participants. It shows the consistently underestimation or under-reporting of physical activity in diary reports compared to results from the activity tracker for the seven days of recording.

Slide 5: The pie charts on this slide show the distribution of levels of physical activity recorded by the activity tracker. The substantial proportion recorded as sedentary is not surprising given the tracker was worn 24/7. ACSM guidelines of 150 minutes of moderate physical activity per week would amount to approximately 1.5% of the total time. Thus according to the activity tracker data, all participants exceeded 150 mins per week of moderate physical activity.

In summary, the lack of agreement between subjective and objective measures of physical activity encourages further investigation. The highly variable nature of the relationship between physical activity and mental health may contribute to the weak empirical support for a strong predictive relationship between mental health and physical activity.

Thank you for viewing and listening to this talk. Stay well, keep safe, kia kaha (be strong).