

## An initial exploration of the association between psychological distress and sedentary behaviour in first year undergraduates. A Practice Report

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### Abstract

*University students are reported to have a higher prevalence of psychological distress than the general population. Consequently, research surrounding factors that may contribute to poor mental health of students is imperative in order to identify interventions for this at-risk population. Previous research has determined that sedentary behaviour is associated with physical health, with an emerging focus on the association between sedentary behaviour and mental health. As the role of student consists of primarily sedentary behaviours such as reading, writing and computer use, the relationship between these activities and student mental wellbeing is particularly relevant. The presentation reported on the findings of study conducted on a sample of first year undergraduates and their reported levels of psychological distress and use of time. The findings highlight the diverse and demanding lifestyles of today's student and the need for further research into student mental well-being.*

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## Background

A quarter of the Australian population are affected by psychological distress, with young adults (18-35) reported to experience the highest levels (Cvetkovski, Reavley, & Jorm, 2012; Stallman, 2010). Psychological distress is composed of a number of mental health symptoms including low mood, anxiety or depression, and has been shown to have a negative correlation with psychological wellbeing (Winefield, 2009). Furthermore, psychological distress can be a precursor of more serious mental and physical health issues later in life (Hickie, 2011).

Research has shown a higher prevalence of psychological distress in Australian university students compared with the general population (Cvetkovski et al., 2012; Stallman, 2010). Despite distress occurring in both undergraduate and postgraduate students (Stallman, 2010), first year university students are considered to be particularly vulnerable due to the significant changes associated with the transition to university (McInnis, 2001).

The relationship between psychological distress and lifestyle is multifactorial and complex. However, recent research indicates an association between sedentary behaviour and poor psychological health. Sedentary behaviour (SB) is defined as any waking activity that involves sitting or reclining and has an energy expenditure < 1.5 metabolic equivalents (METS) (Sedentary Behaviour Research Network, 2013). An abundance of research exists investigating the association of sedentary behaviour and physical health, particularly diabetes (Grøntved & Hu, 2011) and cardiovascular disease (Owen, 2012). However, fewer studies have been conducted to investigate the association between SB and mental health (Atkin, Bull,

& Biddle, 2012; Kilpatrick, Sanderson, Blizzard, Teale, & Venn, 2013; Sloan et al., 2013).

One of the earliest studies to focus on SB and mental health was conducted by Hamer and colleagues (Hamer, Stamatakis, & Mishra, 2010) on a representative sample of Scottish adults. Study results found that high engagement time (>4hrs/day) in TV and screen-based entertainment (TVSE) was associated with poor mental health. However, no association was found for participants with low to moderate exposure to TVSE (up to 4 hrs/day) (Hamer, Stamatakis, & Mishra, 2010). Similar findings were reported in a UK study, with non-occupational sitting time—watching television, computer usage, socialising and commuting—found to have an adverse association with mental wellbeing in women, whereas only computer use had an adverse association with mental wellbeing for men (Atkin et al., 2012). In a combined study of men and women, Sloan and colleagues (Sloan et al., 2013) determined that high SB (> 10 hours per day) was associated with high psychological distress, independent of the SB activity. Furthermore, it was found that being active did not have an association with lower psychological distress, indicating that a person can meet the recommended daily physical activity levels but high levels of SB counteracts any mental health benefits achieved through activity (Sloan et al., 2013).

As a population whose "occupation" is primarily sedentary (Finlayson, Cecil, Higgs, Hill, & Hetherington, 2012), university students are an important cohort to identify how sedentary lifestyle behaviours relate to their mental health. In a study of 3,367 public servants, Kilpatrick and colleagues (2013) found that employees primarily engaged in work that involved a longer time

period (> 6hrs/day) of occupational sitting demonstrated moderate psychological distress for men, and moderate to high psychological distress for women. However no association was determined between occupational SB and very high psychological distress (Kilpatrick et al., 2013). Contrary to these findings, an earlier study on a sample of Dutch men found no association between occupational SB and mental health. However, a positive association was determined between recreational SB, in particular TV, and mental health (Proper, Picavet, Bemelmans, Verschuren, & Wendel-Vos, 2012).

With the emerging research interest in recreational and occupational sedentary behaviour and mental health, the aim of the present study was to explore sedentary behaviours and psychological distress levels of a cohort of first year health science undergraduates.

## Method

### *Participants*

Participants consisted of 218 first year health science students, attending a metropolitan campus at the University of South Australia (UniSA). Age of the sample population was positively skewed ( $M=18.8$  years,  $SD=2.51$ ) with 95.3% of students aged between 18 and 24 years, and the majority (65.5%) female.

### *Measures*

Psychological distress was measured using the *Kessler Psychological Distress Scale* (K-10), being a 10-item scale that measures the level of distress experienced during the previous 30 days (Kessler et al., 2002). The scale consists of five response categories (1 = none of the time to 5 = all of the time) with total scores on the scale ranging from 10 to

50 (Kessler et al., 2002). Consistent with cut off points applied by the Australian Bureau of Statistics, scores were classified into four groups for analysis consisting of low distress (10–15), moderate distress (16–21), high distress (22–29) and very high distress (30–50).

Sedentary behaviour was assessed using the *Multimedia Activity Recall for Children and Adults* (MARCA), an electronic 24h use of time recall that measures use of time and energy expenditure (Gomersall, Olds, & Ridley, 2011). Participants recalled 1 to 2 days of activity, choosing from 600 different activities in time slices as fine as 5 minutes. Activities were classified into four categories based on energy expenditure, being sleep (0.9 METS); sedentary behaviour (< 1.5METS) such as study, and watching TV; low physical activity (LPA)(1.6–2.9METS) including socialising, driving, and occupations such as checkout operator; moderate to vigorous physical activity (MVPA) (> 3.0METS) such as exercise, physically active chores, and occupations such as waitressing (Ainsworth et al., 2011). In instances where a participant recorded two days, time spent in each activity was averaged.

### *Procedure*

As part of a broader project, the K10 and MARCA surveys received ethics approval from the UniSA's research ethic committee. The data were collected during second semester from a group of first year undergraduates attending a regular class. Students were informed that they would be de-identified and that participation was voluntary.

**Table 1: Mean time per day, per category, split by psychological distress levels**

|                     | SB     | LPA    | MVPA   | Sleep  |
|---------------------|--------|--------|--------|--------|
| Low (10 - 15)       | 8.8hrs | 4.7hrs | 2.2hrs | 8.4hrs |
| Moderate (16 – 21)  | 8.2hrs | 5.0hrs | 2.1hrs | 8.7hrs |
| High (22 – 29)      | 8.7hrs | 4.6hrs | 1.8hrs | 9.0hrs |
| Very High (30 – 50) | 9.1hrs | 4.9hrs | 1.9hrs | 8.2hrs |
| Total               | 8.7hrs | 4.8hrs | 2.0hrs | 8.6hrs |

## Results and Discussion

Overall, 80.4% of students ( $n=174$ ) reported elevated scores on the K10 ( $M=21.21$ ,  $SD =6.63$ ), with 20.5% ( $n=45$ ) reporting low levels of psychological distress (10-15). A total of 38.8% of students ( $n=85$ ) reported scores between 16-21 indicating moderate psychological distress; 26.5% ( $n=58$ ) reported scores of 22-29 indicating high psychological distress; and 14.2% ( $n=31$ ) reported scores between 30-50 indicating serious very high psychological distress. A series of Mann Whitney analyses indicated no significant differences between student level of distress based on age or gender.

In regards to use of time, students displayed a similar pattern of average energy expenditure across all psychological distress levels. Table 1 presents the average amount of time spent per day across four categories of activities split by psychological distress levels.

A multinomial regression analysis was conducted to determine whether any categories of energy expenditure related to levels of psychological distress. However the model only explained 5% (Cox and Snell R Square; Nagelkerke R Square) of the variance in psychological distress. Table 2 presents the results indicating that no

association was found between SB and the four levels of psychological distress, however a weak negative association was found between MVPA and high psychological distress.

In examining the results a key distinguishing feature should be highlighted. Participants involved in this study were in a much lower age range ( $M=18.8$  years) when compared with other studies in this field, such as Atkin et al. (2012) ( $M=40.4$  years), Kilpatrick et al. (2013) ( $M=46.2$  years) and Sloan et al. (2013) ( $M=43$  years). Consequently the association between SB and psychological distress may vary across different age ranges. This variation may be a result of differing behaviours and motivations, supporting Atkin et al.'s recommendation that individual SB activities should be assessed in context with behaviours and motivations, as opposed to duration of time performing SB activities.

There are a number of limitations of this study that should be highlighted. Firstly, the use of time data relied on student recall of the previous day/s activities, resulting in potential reliability issues. Secondly, the sample was made up of a cohort of students studying health science which as a result may contribute towards healthier lifestyle behaviours when compared with broader university samples. Furthermore, data was

**Table 2: Association between SB and psychological distress**

| PD Level         | B(SE)        | Wald  | df | p    | 95% CI for Odds Ratio |       |       |
|------------------|--------------|-------|----|------|-----------------------|-------|-------|
|                  |              |       |    |      | Odds                  | Lower | Upper |
| <b>Moderate</b>  |              |       |    |      |                       |       |       |
| Intercept        | 3.048(2.03)  | 2.25  | 1  | .134 |                       |       |       |
| SB               | -.003(.002)  | 1.93  | 1  | .164 | .997                  | .992  | 1.001 |
| LPA              | -.001(.003)  | .286  | 1  | .593 | .999                  | .994  | 1.004 |
| MVPA             | -.003(.003)  | 1.219 | 1  | .270 | .997                  | .992  | 1.002 |
| <b>High</b>      |              |       |    |      |                       |       |       |
| Intercept        | 4.319(2.18)  | 3.923 | 1  | .048 |                       |       |       |
| SB               | -.004(.002)  | 2.718 | 1  | .099 | .996                  | .991  | 1.001 |
| LPA              | -.004(.003)  | 2.136 | 1  | .144 | .993                  | .991  | 1.001 |
| MVPA             | -.007(.003)  | 5.028 | 1  | .025 | .993                  | .987  | .999  |
| <b>Very High</b> |              |       |    |      |                       |       |       |
| Intercept        | -1.424(2.49) | .327  | 1  | .567 |                       |       |       |
| SB               | .001(.003)   | .310  | 1  | .578 | 1.001                 | .996  | 1.007 |
| LPA              | .002(.003)   | .379  | 1  | .538 | 1.002                 | .996  | 1.008 |
| MVPA             | -.001(.003)  | .138  | 1  | .710 | .999                  | .992  | 1.005 |

gathered in the second semester of university, with students found to have elevated psychological distress levels in second semester compared with first semester (Cvetkovski et al., 2012; Stallman, 2010). Consequently increased academic stress may have had a confounding effect, which was not controlled for in this study. As a result, further research is necessary to determine whether an association between SB and psychological distress exists for students studying programs that do not have a health science focus, and that controls for existing academic stress.

In conclusion, the present study explored the association between sedentary behaviour and psychological distress in a cohort of first year health science undergraduates. This is the first study that we are aware of that has focused on sedentary behaviour in a student population, and it has highlighted the potential difference that the association between SB and psychological distress has in different cohorts. Recommendations of future research include a focus on specific

cohorts which should provide further insight into the variability amongst groups and any association between SB and psychological distress.

### Overview of conference feedback

Discussion by delegates at the 2014 17<sup>th</sup> International First Year in Higher Education Conference in Darwin, Australia, reinforced the multifactorial and complex nature of psychological distress and lifestyle, identifying additional key factors as:

- resilience
- sense of belonging
- academic stress points
- exacerbation of pre-existing psychological distress
- non-acceptance into first course preferences
- external commitments including part time employment

Overall, delegates provided positive feedback, demonstrating an interest in further examination of the association between student psychological distress and sedentary behaviour. In particular, interest was expressed in further exploration of a larger data sample that would enable a comprehensive analysis of individual activities engaged in by students, and the investigation of potential gender differences.

The conference outcomes highlighted that student psychological wellbeing remains a key concern for higher education. This focus indicates the importance of the continuation of higher education research into different aspects of student life, in an attempt to further understand and where possible improve student mental wellbeing.

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