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ORIGINAL RESEARCH

The exploration of physical fatigue, sleep and depression in paramedics: a pilot study

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Abstract

Ambulance paramedics are members of a discipline that forms a unique part of the emergency services. As pre-hospital providers they are constantly and increasingly faced with heavy workloads that are physically, mentally and emotionally tiring. Fatigue and sleep disturbance are factors which can compromise the effectiveness of these workers, and as a result not only hamper patient safety but can have detrimental consequences on the paramedics' health and overall well-being. The objective of this study was to investigate the impact shift work on physical fatigue, sleep and psychological factors among paramedics in Australia.

Methods

A convenience sample of paramedics was asked to complete a number of self-reporting standardised questionnaires: The Epworth Sleepiness Scale (ESS) (8-items), Berlin Questionnaire (BQ) (10-items), Pittsburgh Sleep Quality Index (PSQI) (19-items) and the Beck Depression Inventory (BDI) (21-items). Ethics approval was granted.

Results

The study recruited 60 participants, the majority of which were male 77% (n=46), > 45 years of age 31% (n=19), and having worked shift work between 5-10 years 35% (n=21). Nine out of ten (92%, n=55) of paramedics reported having experienced fatigue in the last 6 months, with 88% (n=53) believing it had affected their performance at work. The ESS reported 30% (n=18) of people had excessive daytime sleepiness, and 10% (n=6) being dangerously sleepy. Statistical significance was observed in the ESS items 'chance of dozing while sitting and talking to someone' (p<0.05), and 'whilst stopped in traffic for a few minutes' (p<0.05) between males and females. Almost half (48%, n=29) of paramedics answered yes to having nodded off or fallen asleep whilst driving. The PSQI found 68% (n=41) of participants suffered poor quality sleep, while 21% (n=13) of respondents were at high risk for sleep

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apnoea (BQ). Depression was found to be mild among 27% (n=16) and moderate among 10% (n=6) of respondents.

Conclusions

Shift work affects health and well-being both physiologically and psychologically, which translates from work into home. Further research using a larger sample size is warranted to prevent the issues of patient safety, work-related fatigue and the cumulative effects of shift work in paramedic employees.

Keywords

circadian rhythm; fatigue; occupational stress; shift work; sleep deprivation; sleep disorder

Introduction

Ambulance paramedics form a discipline within the health profession, providing a 24 hour service to the community. Eight ambulance services provide emergency and non-emergency pre-hospital services to the Australian population. As of 2008/09 these services had 13,283 full time personnel, 82.1% of which were primarily operational. Furthermore, 81% of the workforce is less than 50 years of age, which is an important aspect as shift workers become less tolerant of shift work schedules with increased age. The combined ambulance services attended over 2.9 million incidents throughout Australia, with approximately two third of these being emergency or urgent incidents (emergency 39%, urgent 26%, non-emergency 35%).¹ Ambulance paramedics in Australia complete various shift configurations including day, afternoon and night shifts and rotating rosters, all of which interfere with any consistency in individuals' sleep quality and natural circadian rhythm.² Across Australia paramedics work within metropolitan, rural and remote rural locations. In country locations paramedics may also work on-call as part of their usual roster; this refers to being called out to respond over a 24-hour period.

Paramedics are constantly and increasingly faced with difficult clinical cases and workloads that are taxing physically, mentally and emotionally. For example, paramedics are regularly required to problem-solve delicate and complex issues, in an independent, self-governing and timely fashion. They are also required to perform clinical skills, drug administration and driving with professionalism and care. Paramedics work along a continuum of clinical skills that can be practical or emotional in nature. Their management is crucial during treatment of critical patients, where skills are paramount and errors in judgement or lapses in concentration could end up having fatal consequences.

The violent and agitated patients are also a challenge to paramedics, these patients can be drug/alcohol affected or living with mental health issues. Such patients must be approached with caution, as unfortunately assaults and abuse of ambulance personnel is not uncommon.³ ⁴ A recent Queensland Government report citing 94.37% ambulance workers report being assaulted or verbally abused by intoxicated persons whilst on duty.⁵ While 120 ambulance officers were assaulted in NSW in 2008-09, representing more than a 60% increase on the previous year.⁶ Furthermore paramedics are faced with the palliative and terminal patients, as well as the emotions of the patient, family and friends as these individuals face their mortality. In addition to dealing with volatile and delicate situations, ambulance officers are aware that they are also exposed to illness and disease, which can affect their health or the wellbeing of their own families.

Paramedics must be mindful that they are exposed to those who are suffering and emergency workers are often confided in as they are an anonymous face to an organisation which is highly valued and respected within the community they serve; paramedics are considered the most trusted profession for the last seven years.⁷ Patients' needs are many and varied from the acopic, lonely and social issues to the medical emergencies. Paramedics strive to provide optimum care to those patients they treat on a daily basis. However, fatigue and sleep disturbance are factors which can compromise the effectiveness of paramedic members and their performance, and as a result not only put at risk patient safety but can have detrimental consequences on the paramedics' health and overall well-being. It is crucial these workers obtain restful breaks and restorative sleep, so they can maintain a professional, reliable and consistent approach to their patients and preserve their own state of well-being. Researcher and psychologist James Courtney states that the nature of the rotating roster gives paramedics little opportunity to adjust; disrupting sleep patterns could contribute to mental ill health.⁸

The next section will provide a background and context to physical fatigue, sleep and the psychological factors associated with shiftwork. A brief description of the following areas will be covered providing the necessary framework: sleep, fatigue, circadian rhythm, sleep debt, health issues, and shift work.

Fatigue

Fatigue is a state of tiredness, effecting both mind and body; where an individual is unable to function at their normal level of abilities. Causes of fatigue are attributed to numerous sources including lack of restorative sleep, sleep disturbances, poor lifestyle (i.e. diet, inertia), shiftwork, occupational stress, depression, isolation and relationship issues. Alertness, vigilance, concentration, judgement, mood and performance are all significantly affected by fatigue,⁹ with memory impairment, problem solving and decision making leading to decreases in work productivity and performance.¹⁰ Such mental and physical stressors make way for the possibility of increased risk which could inevitably manifest themselves in the form of accidents, errors and injuries to individuals or others. Fatigue is four times more likely a cause of workplace impairment than drugs or alcohol.¹¹ A recent study reports that emergency medical services have unhealthy levels of sleep quality and fatigue.¹² Paramedics are one group of healthcare workers who are subject to disturbances in sleep and pre-hospital emergency medicine fatigue; this is a burgeoning issue as paramedics are faced with long working hours and an ever increasing workload. A 2006/07 report by The Council of Ambulance Authorities (CAA) states ambulance services in Australia had a 17.2% increase across all incident types (i.e. emergency, urgent, non-urgent) in the last 5 years.¹³

Sleep

Historically, sleep was seen as a passive process, an inactive state of the brain. It was regarded as a reduction in sensory input leading to an inevitable decline in brain activity and therefore the subsequent occurrence of sleep.¹⁴ Thoughts changed after the discovery of rapid eye movement (REM) and the duality of sleep was revealed. The 1960s gave birth to this notion of REM being a completely separate state characterised by cerebral activation, active motor inhibition and dreaming.¹⁴ REM is responsible for improving an individuals' ability to sustain attention during waking hours,¹⁴ and is also correlated with intellectual functioning. Furthermore non-REM sleep has been found to enhance the function of the immune system and thus mediate health, whereas REM restores our energy and consolidates memory.¹⁵ It is clear that sleep serves a vital role in the functioning and health of an individual. It is a natural state of rest which fosters a restorative function in the physiological, neurological and psychological states. Redeker et al reported that most of the body systems are restored by

sleep, which has positive effects on growth, healing, the immune function and metabolic activities.¹⁶ Thus any disruption in the normal sleep patterns of an individual would only act to hinder well-being, as sleep plays a crucial role in many areas of health.

Circadian Rhythm

The circadian rhythm is an intrinsic cyclical rhythm which is synchronised with the 24 hour solar day and is kept constant by the light/ dark cycle,¹⁷ regulating biological, physiological and metabolic activity. For those individuals engaged in shiftwork these usual patterns and the stable circadian rhythm become desynchronised and the body must adjust to being kept awake and alert when it naturally wants to sleep. This results in a negative effect on many areas including release of melatonin, cortisol levels and core body temperature.¹⁷ Sunlight is a strong cue affecting the circadian rhythm and acts to suppress the secretion of melatonin. Melatonin is believed to be the hormone which induces sleep in humans. Hack et al report that this hormone usually released in darkness is suppressed with night work;¹⁸ therefore shift workers experience more difficulty sleeping during the day. Interestingly it was found that supplemental melatonin does not improve sleep quality or duration in Emergency Medical Service (EMS) personnel working rotating night shifts.¹⁹ Symptoms of circadian rhythm disturbance include fatigue, sleep disturbance, gastrointestinal complaint and poor performance,¹⁷ similar to that experienced by travellers who suffer jet lag. A recent article by Rajartnam in *The Lancet* described the therapeutic potential for phase-shifting drugs such as Tasimelteon in alleviating sleep problems, improving sleep latency and maintenance in those especially suffering jet lag and shift work. Tasimelteon has a direct sleep promoting effect.²⁰

Sleep debt

Sleep debt refers to the lack of cumulative sleep built up overtime, which leads to mental and physical fatigue. Sleep debt can be paid back with extended rest which may take up to months to recover. According to Dement a leading authority in sleep, sleep debt is an accumulation of amount of lost sleep.¹⁴ Shift workers reportedly sleep 1-4 hours less than day-workers which mainly effects stage 2 (a transitional phase where an individual gradually becomes less conscious of their external surroundings) and REM sleep.²¹ This suggests the possibility that the majority of shift workers could be facing continual accumulation of sleep debt. A sleep deficit would only compound the risk of associated fatigue-related error and accidents in the health care context of patient safety. Renowned sleep researcher Drew Dawson found that approximately 20–25 hours of wakefulness produced performance decrements equivalent to those observed at a blood alcohol concentration (BAC) of 0.10, with 17 hours of sustained wakefulness observed at an equivalent of 0.05 BAC.²² These figures are concerning, with both the safety of paramedics and the ability to provided health care to the highest standard to patients being highly compromised.

Psychological Factors

Shift workers suffer not only physically but also mental health issues. Mood is often affected with increases in headaches, irritability, anxiety and depression.²³ These can be devastating with flow on effect to disrupt domestic and social relationships. Shift workers often miss out on social and sporting events and family gatherings, when they need to work or sleep instead. These demands can lead to feelings of frustration, isolation and depression as valuable family and personal time is lost. There has been a long known association between sleep deprivation and depression, with both conditions having the ability to lead to the other. In a study of retired shift workers, the incidence of depression was more frequent in shift workers when

compared with day workers.²⁴ Furthermore one study suggests vulnerable individuals may develop clinical depression when working night shift.²⁵

These health issues are considered an international problem amongst paramedic workers. A few international examples include; a US report that found emergency medical service (EMS) responders, including paramedics and emergency medical technicians were at risk of decrements in mental and physical performance,²⁶ a Japanese study reporting that older/qualified paramedics suffer more mental stress than emergency medical technicians (EMTs),²⁷ and a study of Scandinavian ambulance personnel (25% of males, 20% of females) reporting two or more health complaints.²⁸ In the UK, ambulance employees were found to have higher levels of mental and physical ill health²⁹ and a Scottish study investigating paramedic personnel also found the mental and emotional well-being of these workers to be compromised.³⁰

These are a few of the effects of shift work amongst paramedics. When undertaking to commit to such a lifestyle, individuals must keep in mind the stressors and work diligently to minimise their impact. Harrington reported 20-30% of workers leave shift work within 2 to 3 years because of ill health,³¹ with shift work continuing to be the most important reason for physicians leaving the practice of emergency medicine.³²

Shift work

Shift work can have a detrimental effect on pre-hospital operators, leading to compromised patient safety, and therefore errors in clinical judgement. Swaen et al reported a strong association between shift workers and the risk of being injured in an occupational accident, with those who engaged in shift work being almost three times more at risk of such an accident compared to their day worker counterparts.³³ Moreover another study concluded that nurses who worked rotating rosters exhibited more sleep/wake cycle disruption and nodded off more at work compared to nurses who worked day/evening shifts. In addition, nurses who worked rotating rosters had twice the odds of nodding off while driving to and from work and reported twice the number of accidents or errors related to sleepiness.³⁴ This is concerning as paramedics are shift workers who are often called in to deal with urgent and critical incidents time and again over the duration of a single shift. Consideration must also be given to the safety of the paramedic and patient in transit while travelling to and from incidents. One study stated that 17-18 hours of wakefulness was likely to show a significantly slower reaction time and an increasing likelihood to miss information, with fatigue reaching a level that compromises safe performance.³⁵

Long hours, night work, high workload and ever increasing sleep debt combined with fatigue can be potential for dire outcomes. A recent article reflects the gravity of the issues and attitudes currently faced, with one paramedic quoted as saying “serious issues included unfilled and dropped shifts; insufficient resources; delayed dispatch times; cuts in overtime rates; and late meal breaks leading to fatigue and illness”.³⁶ This comes after a man died after waiting over three hours for an emergency ambulance, with paramedics increasingly forced to skip regular meal/rest breaks to cope with demand.³⁷ In 2005-06 shift workers made up 16 % of the working population, though they incurred 27% of all work-related injuries.³⁸

There is a plethora of research which has been undertaken pertaining to shift workers; however the paramedic discipline remains one area that is relatively untouched. A report by the CAA acknowledges the risk of fatigue in healthcare and abundance of research therein, though that these findings may not be replicated in pre-hospital environments.³⁹ A recent

literature review regarding the effects of shiftwork on ambulance paramedics,⁴⁰ outlines the need for exploring this subject of concern with further research warranted, especially within our own Australian context. The objective of this study was to investigate the impact shift work on physical fatigue, sleep and psychological factors among paramedics in Australia.

Method

Design

A cross-sectional study design using the *Epworth Sleepiness Scale*, the *Berlin Questionnaire*, the *Pittsburgh Sleep Quality Index*, the *Beck Depression Inventory*, and a brief demographic questionnaire were administered to a cohort of practicing paramedics.

Participants

All participants eligible for the study were currently practicing ambulance paramedics employed by an ambulance service in Australia. The final sample included 60 respondents.

Instrumentation

The overall questionnaire package included: 8 items from the Epworth Sleepiness Scale (ESS), 10 items from the Berlin Questionnaire (BQ), 19 items from the Pittsburgh Sleep Quality Index (PSQI) and 21 items from the Beck Depression Inventory (BDI). A brief set of demographic and health related questions (8 items) were also included. All questionnaires were self-administered (see appendix 1).

The ESS is an 8 item questionnaire that measures a person's level of daytime sleepiness. It measures a person's propensity to doze off or fall asleep in 8 various daily situations which is scored on a 4 point scale (0-3). The total score is a summation of the various categories with a final score between 0-24. A high score represents a greater amount of daytime sleepiness.⁴¹ This questionnaire is used internationally as a measure of daytime sleepiness as there is a high level of internal consistency within the ESS.⁴²

The BQ consists of 10 items within 3 categories which relate to the risk of having sleep apnoea. The three categories relate to presence and frequency of snoring, wake-time sleepiness and fatigue, and obesity or hypertension. Participants who scored consistently positive for symptoms in two or more categories are considered at high risk for sleep apnoea. This questionnaire is the outcome of a conference on sleep amongst US and German physicians in Berlin in 1996; which demonstrated internal consistency with a Cronbach correlation of 0.86-0.92.⁴³

The PSQI was developed to provide a reliable and valid measure of sleep quality and identify 'good' and 'bad' sleepers. It consists of 19 items grouped into seven components, scored on a 0-3 point scale. These components are sleep quality, sleep latency, sleep duration, sleep efficiency, sleep disturbance, use of sleep medication, and daytime dysfunction. These seven scores are totalled to give a global PSQI ranging from 0-21. A score > 5 indicates poor sleep quality; with a diagnostic sensitivity of 89.6% and specificity of 86.5% of determining the good from the poor quality sleepers. The PSQI demonstrated ease of use and a high internal consistency across the seven components.⁴⁴

The BDI is a questionnaire which indicates severity of depression. It is composed of 21 items scored on a 0-3 point scale. Items 1-13 refer to psychological symptoms, and items 14-21 refer to physical symptoms. The questions in the BDI assess mood, pessimism, sense of

failure, self-dissatisfaction, guilt, punishment, self-dislike, self-accusation, suicidal ideas, crying, irritability, social withdrawal, insomnia, fatigue, appetite, weight loss, bodily preoccupation and loss of libido. The BDI ranges from a score of 0-63; a high score indicates severe depression. It has been shown to have internal consistency and stability with a high degree of validity and reliability.^{45, 46}

Procedures

Questionnaires were distributed and collected by a colleague not related to this study at the National Symposium for the Journal of Emergency Primary Health Care, at The Alfred Hospital, Melbourne on 8th April 2010. Participants were given explanatory statements regarding the study and consent was implied through completion of the questionnaires. The questionnaires took approximately 20 minutes to complete. Ethics approval was obtained from the Monash University Standing Committee on Ethics in Research Involving Humans (SCERH).

Data analysis

The Statistical Package for Social Sciences (SPSS; Version 18.0) was used for data storage, tabulation, and the generation of descriptive statistics. Although results were derived from Likert-type scales and are therefore considered ordinal level data, they were normally distributed allowing the data to be treated as interval level data.⁴⁷ Thus inferential statistics, *t*-test and ANOVA, including post hoc tests where required, were used to compare the differences between age groups, gender, and length of employment. Preliminary analyses were conducted to ensure there was no violation of the assumptions of normality, linearity, multi-collinearity, and homoscedasticity. The effect sizes were calculated to evaluate the findings and results were considered statistically significant if the *p* value was < 0.05. Spearman's correlation was used to analyse variables, as dichotomous data were present. Three of the four scales were tested for internal consistency using Cronbach's coefficient.

Data collected was entered into an Excel spreadsheet using a specific coding system. A check for accuracy was completed using 15% of randomly selected original articles against the excel data sheet. Barhyte and Bacon report this choice of 15% as a sufficient process for accuracy in verification of data.⁴⁸ Missing data was excluded from final analysis.

Results

Demographics

Due to the simplicity and ease of the questionnaires all the returned surveys were able to be used for final analysis (n=60). Three-quarters of respondents were male (76.7%) and the largest age group was those aged over 45 years (31.7%). As a pilot study this is a reasonably representative sample as average age of participants is 39.7 years. For example, in Victoria the workforce has an average age of 37.5 years and has increased the proportion of female employees to 38.2% in recent years.⁴⁹ Most employees reported having worked shift work between 5-10 years (35%), followed by those working 10-15 years (26.7%). The complete participant distribution profile is presented in Table 1.

Table 1: Demographic results

Age

	Number	Percent
<21 years	0	0
21-25 years	3	5
26-30 years	9	15
31-35 years	10	16.7
36-40 years	13	21.7
41-45 years	6	10
>45 years	19	31.7
Total	60	100

Gender

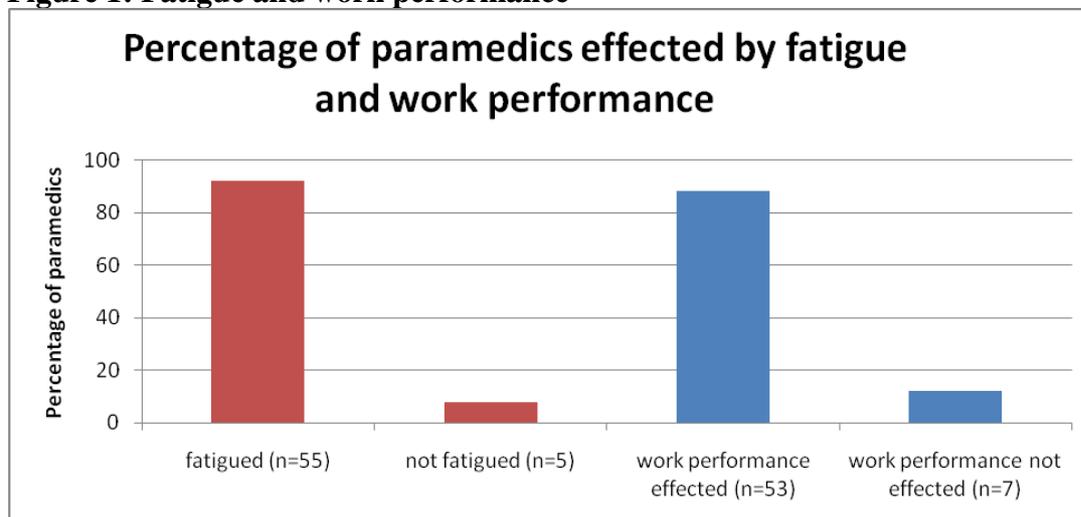
	Number	Percent
Female	14	23.3
Male	46	76.7
Total	60	100

Length of Shift Work

	Number	Percent
< 5 years	9	15
5-10 years	21	35
10-15 years	16	26.7
15-20 years	3	5
>20 years	11	18.3
Total	60	100

The proportion of subjects experiencing fatigue over the last 6 months was 92% (n=55), with 8% (n=5) reporting no fatigue. The overall proportion of paramedics believing fatigue has effected their work performance was 88% (n=53), this is represented in Figure 1 below.

Figure 1: Fatigue and work performance



Participants were also invited to suggest reasons for their fatigue with an open-ended question (item 5). Responses given included: late/no meals, shiftwork, nightshifts, long shifts and sleep difficulties. Some of the responses included “Late/no meal (it’s not the food that I need, it’s the 30 minute break”, “exacerbation of sleep problems, troubled/broken sleep patterns, difficulty sleeping adequately before shifts”, “long shift, too long night shifts”, “14hr night shifts, rural area, inadequate after hours crews and ill-equipped hospitals requiring urgent IHTs” and “nightshift workload, extra work hours, constantly having to work over at end of shifts”.

Epworth Sleepiness Scale (ESS)

The mean scores reported for likelihood to doze while ‘sitting and talking to someone’ and ‘in a car, stopped in traffic’ is M=0.43 (SD= 1.30) and M=0.47 (SD= 1.29) respectively. Further distribution of results is indicated in Table 2 below. Also ‘sitting, inactive in a public place’ recorded a mean of 0.85 (SD= 1.38). Overall results for the ESS suggest almost six out of ten (58%) who completed the ESS had enough sleep. One third (n=18) reported being excessively sleepy, with 10% reporting dangerously sleepy levels (Table 3).

Table 2: ESS Participant responses

SITUATION	MEAN	SD
Sitting and reading	1.82	1.30
Watching television	1.62	1.37
Sitting, inactive in public place	0.85	1.38
Passenger in a car	1.27	1.47
Lying down in the afternoon	2.22	1.26
Sitting and talking to someone	0.43	1.30
Sitting quietly after lunch	1.38	1.41
In a car, stopped in traffic	0.47	1.29

Table 3: ESS Frequencies and Percentages

ITEM	FREQUENCY	PERCENTAGE
Enough Sleep	35	58.3
Excessive Sleepiness	18	30.0
Dangerously Sleepy	6	10
Missing	1	1.7
TOTAL	60	100.0

Independent-samples *t*-test was used for analysing the items of the ESS for male and females who complete the questionnaire. Two of the individual items analysed (questions 6 and 8) were statistically significant for males and females. These items were likelihood of dozing while ‘sitting and talking to someone’ and ‘in a car, whilst stopped in traffic for a few minutes’. The former reporting for males $M= 0.54$, $SD= 1.47$ and females $M= 0.07$, $SD= 0.27$; $t(53.13)= -2.07$, $p= 0.04$ (two tailed). The magnitude of the differences in means (mean difference= $-.47$, 95% CI: $-.930$ to $-.014$) was small ($\eta^2= -0.21$). The latter focusing on likelihood of dozing in a car, whilst in traffic suggests males $M=0.61$, $SD= 1.45$ and females $M= 0.00$, $SD= 0.00$; $t(45)= -2.84$, $p= 0.007$ (two tailed). The magnitude in differences in means (mean difference= $-.61$, 95% CI: -1.04 to $-.18$) was small ($\eta^2=-0.28$). Cohen (1988, as cited in Baker, 2006) defines 0.2-0.49 as a small effect size, 0.50-0.79 as a moderate effect size, and 0.80+ as a large effect size.⁵⁰ There was no statistical significance noted between age groups or length of shiftwork using an ANOVA.

Berlin Questionnaire (BQ) (for sleep apnoea)

The overall results for the BQ indicated that 76.7% (n=46) of survey respondents were at low risk for sleep apnoea, with 13 paramedics indicating a high risk (21.7%) as represented in Table 4 below. Mean scores for ‘feel tired or fatigued (after sleep)’ and ‘feel tired or fatigued (while awake)’ are $M= 1.94$, $SD= 1.31$ and $M= 1.69$, $SD= 1.31$ respectively.

Table 4: Risk of Sleep Apnoea

RISK OF SLEEP APNOEA	FREQUENCY	PERCENTAGE
High Risk	13	21.7
Low Risk	46	76.7
Missing	1	1.7
TOTAL	60	100

Furthermore the mean score for ‘nodding off or fallen asleep while driving a vehicle’ is $M= 0.47$, $SD= 0.50$. Further distribution of the results can be found in Table 5.

Table 5: BQ Participant responses

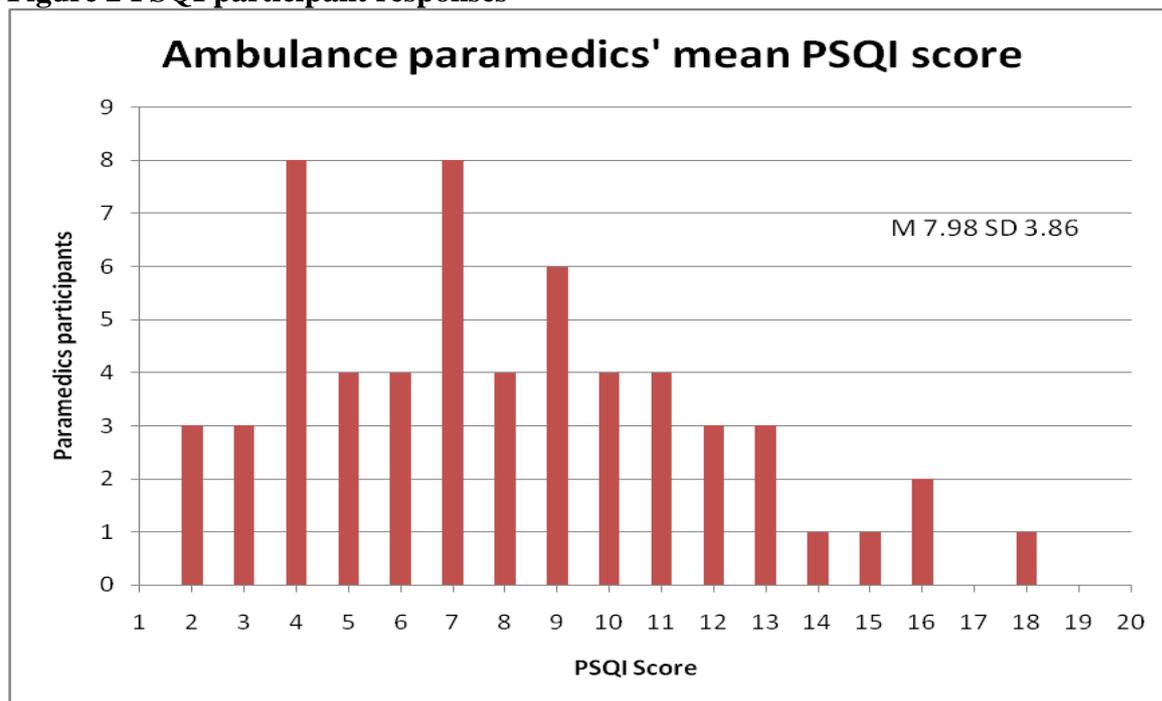
ITEM	MEAN	SD
Do you snore?	0.90	1.255
Loudness	0.96	1.022
Frequency	1.88	0.952
Bother others	0.48	0.509
Quit breathing	3.77	0.777
Feel tired or Fatigued (after sleep)	1.94	1.314
Feel tired or Fatigues (while wake)	1.69	1.307
Nodded off while driving	0.47	0.504
Frequency	3.68	0.768
High BP	0.96	0.398

An independent-samples *t*-test was used to analyse the BQ against males and females. One of the items ('Does your snoring bother other people?') was statistically significant for males (M= 0.42, SD= 0.50) and females (M= 1.0, SD= 0.00; $t(25)= 5.84, p<0.001$ (two tailed). The magnitude in difference in the means (mean difference= 0.577, 95% CI: 0.373 to 0.780) was large ($\eta^2= .63$). There was no statistical significance noted between age groups or length of shiftwork using an ANOVA.

Pittsburgh Sleep Quality Index (PSQI)

Results of to the PSQI indicated that over two thirds of paramedics suffered poor quality sleep (n=41). Approximately a third of participants reportedly have good quality sleep, with 1.7% (n=1) of the data missing from final analysis. The mean PSQI global score in the ambulance paramedics completing the survey was M=7.98 (SD 3.86), in healthy controls it was found to be M=2.7 (SD 1.7).⁴⁴ Figure 2 indicates the distribution of good and poor quality sleep (poor sleep quality indicated by a score > 5).

Figure 2 PSQI participant responses



An independent-samples *t*-test was conducted on the PSQI for male and female participants. Only one item relating to troubled sleep in the past month due to ‘cough or snore loudly’ was statistically significant for males ($M= 0.78$, $SD= 1.56$) and females ($M= 0.08$, $SD= .28$; $t(53.12)= -2.91$, $p= 0.005$). The magnitude of the differences in the means (mean difference= -0.71 , 95% CI: -1.19 to -0.22) was small ($\eta^2= -0.29$). There was no statistical significance noted between age groups or length of shiftwork using an ANOVA.

Beck Depression Inventory (BDI)

Mean scores and standard deviations for the BDI are reported in Table 8 below. Fatigability $M= 0.88$, $SD= 0.56$; Sleep Disturbance $M= 1.07$, $SD= 0.86$; Social Withdrawal $M= 0.42$, $SD= 0.59$; and Lack of Satisfaction $M= 0.42$, $SD= 0.53$. The overall scores for the BDI (Table 6) reported that 61.7% ($n=37$) of paramedic participants have minimal and 26.7% ($n=16$) mild depression, with 10% and 1.7% of ambulance paramedics have moderate and severe likelihood of depression respectively (Table 7).

Table 6: indicates the 21 various symptoms or attitudes of the BDI

SYMPTOM- ATTITUDE	MEAN	SD
Mood	0.18	0.39
Pessimism	0.33	0.60
Sense of Failure	0.20	0.48
Lack of Satisfaction	0.42	0.53
Guilty Feeling	0.13	0.38
Sense of Punishment	0.12	0.45
Self-Hate	0.15	0.40
Self Accusation	0.47	0.59
Self Punitive Wishes	0.13	0.46
Crying Spells	0.24	0.56
Irritability	0.82	0.72
Social Withdrawal	0.42	0.59
Indecisiveness	0.32	0.56
Body Image	0.42	0.59
Work Inhibition	0.53	0.59
Sleep Disturbance	1.07	0.86
Fatigability	0.88	0.55
Loss of Appetite	0.32	0.53
Weight Loss	0.25	0.65
Somatic Preoccupation	0.43	0.50
Loss of Libido	0.50	0.72

Table 7: reports the frequencies and percentages of the BDI

DEPRESSION	FREQUENCY	PERCENTAGE
Minimal	37	61.7
Mild	16	26.7
Moderate	6	10.0
Severe	1	1.7
TOTAL	60	100.0

An independent-samples t-test was used to analyse the items of the BDI for male and female participants. No statistical significance was seen in the overall BDI or within the individual items of the scale.

Comparison of all scales

An independent-samples t-test was conducted to compare the various scales scores between males and females. There was no significant difference in scores for males or females across each of the four scales ESS ($p= 0.467$), BQ ($p= 0.215$), PSQI ($p= 0.635$) and BDI ($p= 0.48$). A one-way between-groups analysis of variance was conducted to explore the impact of age groups 21-25, 26-30, 31-35, 36-40, 41-45 and >45 years on the various questionnaires (BDI, BQ, ESS, PSQI). There was no statistical significance noted between groups.

Reliability

Table 8 reports the internal consistency of three of the scales used. The reliability of the BQ scale was not calculated given the dependence items have on higher level items. For example, item 1 and 8 affect a number of subsequent items if answered negatively. This type of item construction is argued to be inappropriate for reliability calculations using Cronbach alpha coefficients.⁵¹ The three scales had very good reliability with most researchers regarding a Cronbach’s alpha coefficient above 0.70, with a number between 0.80 - 0.90 being a very good indication of reliability.⁵²

Table 8: Reliability of scales

	BDI	BQ	PSQI	ESS
Cronbach’s α	0.90	-	0.91	0.96

Correlation

Spearman’s correlation analysis was undertaken as presented in Table 9 below to investigate the relationship between fatigue in the last 6 months and quality of sleep as measure by the PSQI. There was a moderate negative correlation as interpreted by Cohen⁵³ between the two

variables, $r = -0.459$, $n = 59$, $p = 0.000$. According to Cohen a figure between $r = 0.30$ and $r = 0.49$ indicates a medium/ moderate correlation.⁵³ No correlations were found in the other subscales and fatigue or when the scales were correlated with effect on work performance.

Table 9: Pearson’s Correlation Coefficient

SCALES	FATIGUE
BDI	-0.125
BQ	0.002
PSQI	-0.459**
ESS	0.010

**** Correlation is significant at the 0.01 level (2-tailed).**

Discussion

This pilot study examined the issues faced by ambulance paramedics in Australia. We endeavoured to explore the physical and psychological parameters which affect their own health and well-being. Overall, results suggest there are increased levels of fatigue and depression and poor quality sleep among Australian paramedic shift workers.^{54, 55}

A range of factors has forced the issues of fatigue among pre-hospital emergency shift workers into the forefront of the media in recent times. Paramedics are fighting for better conditions, such as professional rates of pay across Australian states as they attempt to strive to achieve optimum care for the community they serve whilst battling the physical and psychological challenges they are faced with.

Unsurprisingly, paramedics who reported fatigue in the last six months made up 92% ($n = 55$) of survey respondents with most attributing their fatigue to late/ no meal breaks; shift work; night shift and sleep difficulties which include lack of sleep, inability to obtain adequate rest and poor sleep quality. These findings are closely supported by a 2008 Victorian ambulance union survey (non-random) which found 98% of paramedics experienced fatigue in the last 12 months, with a further 87% of paramedics admitting to this fatigue having affected their performance at work.⁵⁵ Our study reports that almost nine in ten 88% ($n = 53$) believed fatigue had affected their performance at work. In 2007 a Victorian coroner’s findings into an inquest into the death of a cardiac patient where the wrong drugs were administered found the paramedics involved were fatigue-affected, stating “I am satisfied that both officers were affected by fatigue at the time of these incidents and that resulting error is always a possibility in such circumstances”.^{56, p.1} With such a highly reported percentage of paramedics attributing work performance to their level of fatigue, it is surprising such mistakes are not more common place. Shen et al reported that the frequency of those individuals engaged in shiftwork had significant effect on subjective fatigue.⁵⁷

A study from The Netherlands suggested a high proportion of paramedic workers reported fatigue, with a tenth exhibiting fatigue levels putting workers ‘at risk’ for sick leave and work disability.⁵⁸

The ESS reported an overall score with almost 60% of paramedics having enough sleep, followed by 30% and 10% being excessively sleepy and dangerously sleepy respectively. This survey indicates levels of daytime sleepiness, with tasks including drug administration and driving at excessive to dangerous levels of sleepiness which pose unacceptable risks to paramedics, patients and other road users. Statistical significance was seen in the ESS looking at male and females when 'sitting and talking to someone' and 'in a car, whilst stopped in traffic for a few minutes'. No explanation can be given for these statistical differences between males and females.

Reporting on the BQ 21.7% (n=13) were found to have a high risk of sleep apnoea with 46 participants at low risk. Approximately just over a fifth of the sample had a high risk of sleep apnoea. This is an important finding since in sleep apnoea is prevalent in 9% of females and 24% of the male adult population with 2% of females and 4% of males clinically symptomatic; it is believed a great proportion of sufferers are undiagnosed.⁵⁹ Sleep apnoea is associated with cardiovascular disease, stroke, sexual dysfunction, loss of memory and concentration, and depression. A 2009 systematic review found individuals suffering untreated obstructive sleep apnoea had a clear increased risk for a motor vehicle collision compared to those not suffering the disorder.⁶⁰

Statistical significance was seen between males and females for the question 'Does your snoring bother other people?' This would be expected, as the male gender is a key determinant for snoring.^{61,62} As snoring is regarded as an indicator for conditions including sleep apnoea, morning headache, daytime somnolence and performance, those at risk should be screened for possible diagnosis as untreated sleep disorders affect many areas of health.

The BQ includes questions relating to whether an individual has nodded off or fallen asleep while driving a vehicle, with 48% (n= 29) responding positively and 43% (n= 26) negatively. The BQ does not indicate whether this has occurred during work or outside work hours. Although this could be considered as irrelevant though as road users, patients, ambulance colleagues are all at risk of serious accident whether during shift or not. A study from Melbourne's Alfred Hospital exploring the prevalence of sleepiness in surviving drivers of motor vehicle collisions (MVC) suggests sleep disorders are an important contributor to MVC, with a surprising amount of shift workers in their cohort of injured drivers.⁶³

Emergency medical residents had a significant risk with an increased number of MVC and near crashes whilst returning home post night shift.⁶⁴ In Australia, the estimated number of collisions due to fatigue varies from 5-50%. The majority of experts estimate a figure between 20-30% of fatal road crashes result from driver fatigue.¹¹ In 1998, 16.6% of fatigue-related fatal crashes were reported, most of these occurring in New South Wales (NSW).⁶⁵ These are staggering findings as paramedics are a group of workers subject to ongoing issues with fatigue and sleep debt. This point is illustrated in the following remarks made by a Melbourne paramedic in a recent study who states "... so fatigued that I fall asleep whilst driving at work (occasionally) and on the way to and from home (most days)".⁶⁶ Although this is a near miss, it is a hazard which can and should be rectified. Brian Gould a 42 year old US paramedic was fatally killed when driving home from a night shift after his vehicle veered across the centre line and hit an oncoming vehicle. Police investigations had ruled out alcohol, drugs and weather as a cause of this accident. However, fatigue is suspected to be the cause, as the driver of the other vehicle stated that Brian was slumped over the wheel and that's all he saw before the impact.⁶⁷ To further demonstrate the potential risk associated with fatigue and driving among paramedic workers, a US paramedic was recently charged for

reckless driving after he crashed the ambulance because he fell asleep at the wheel of the ambulance.⁶⁸

An interesting observation from the data analysed was the outcome of the PSQI with the amount of paramedic respondents who reported poor quality sleep being 68.3 % (n=41). These findings are similar to those found by Courtney et al using the same instrument who found 72% of paramedics to be poor quality sleepers.⁵⁴ Buysse et al in developing the PSQI tested it against various sample groups, when looking at the global scores, samples reported the following: healthy controls M=2.67 (SD=1.70), major depressive disorders M=11.09 (SD=4.31) and those with sleeping problems; disorders of initiating and maintaining sleep (DIMS) M=10.38 (SD=4.57) and disorders of excessive somnolence (DOES) M=6.53 (SD=2.98). Our sample group of ambulance paramedics (M=7.98 SD=3.86) scored 5.31 points higher than that of the healthy control group, marginally lower than reported in a 2010 study on EMS providers (M=9.2 SD=3.7)¹² and similar in a sample of Melbourne paramedics M=7.48 (SD=1.70).⁵⁴ Our sample was 1.45 points higher than individuals who have DOES. Again statistical significance was seen between males and females reporting trouble sleeping in the past month due to coughing or snoring loudly. The implications for physical manifestations of disturbed and poor quality sleep are evident. These implications are also reflected in a UK study where researchers found a third of their sample of paramedic personnel had high levels of general psychopathology, burnout and post traumatic symptoms. Here investigators stated that accident and emergency work compromised these individuals both in mentally and emotionally.³⁰ A 2003 study also reported a tenth of ambulance personnel suffered burnout.⁵⁸

According to Maslach et al burnout is a triad of exhaustion, depersonalization and reduced personal accomplishment, where sufferers can experience depression, job withdrawal, lower productivity and effectiveness and decreased job satisfaction.⁶⁹ These are all traits which are less than desirable in emergency medical workers.

Our respondents indicate 26.7% have mild likelihood of depression, whereas 10% exhibit moderate symptoms. A recently published study involving paramedics of the then Metropolitan Ambulance Service (MAS) in Melbourne, reported 10% of paramedics suffered severe or extremely severe depression with 12% exhibiting moderate levels of depression.⁵⁴

The study by Young and Cooper reports those in the ambulance service have more symptoms of mental ill health than the norm,²⁹ with a further study stating paramedics felt more unhappiness, stress and sadness at work.⁷¹ Ambulance officers and paramedics reported the sixth highest frequency rate for new mental stress claims for men in 2003-04 and 2004-05 in Australia, behind other workers all of who we involved with personal responsibility for the welfare of others.⁷¹ We can clearly see a need to not only address the physical aspects of such a demanding occupation but a greater emphasis must be placed on dealing with the mental stressors and psychological turmoil.

The Cronbach alpha coefficients for the questionnaires chosen had very high values over 0.90 which indicates the questionnaires had high levels of internal reliability. A moderate correlation was observed between the PSQI and fatigue in the last 6 months. This is not a surprising outcome as the PSQI is a measure of sleep quality, with fatigue being a key contributor to disrupting such quality sleep.

Limitations

The design of a cross-sectional study makes it difficult to provide a trend as to direction of results, as we only have data from one moment in time. Also given the small sample size results and external validity should be treated with some caution. The questionnaires were self-reported measurements and therefore maybe subject to reporting/recall bias, a prospective study using objective measures reduces recall bias and subjective interpretation. Despite this, one of the strengths in our study is the use of internationally standardised and highly validated questionnaires used to assess the sleep quality and fatigue in ambulance paramedics.

Further research and recommendations

Volunteer ambulance paramedics are under researched in Australia. Ambulance volunteers are an integral part of emergency medical services in Australia, from metropolitan, to rural and remote areas. They may be first responders to the scene, or those who accompany paramedics to incidents. However, their contribution to communities and to the ambulance services is paramount and invaluable. Closer examination of fatigue, sleep and psychological related factors among ambulance volunteers is an area requiring further research.

The health of ambulance paramedic shift workers lies in the hands of both the employer and the employee. Both parties play crucial roles in the well-being of workers. In recent times much has been done by the employer organisations across Australia to improve this situation. These include the introduction of roster changes (limiting the number of night shifts); longer rest breaks between shifts and education to paramedics about fatigue and the risks involved. As mentioned, paramedics can also reduce their fatigue and recovery from long/night shifts by practicing good sleep hygiene, keeping fit with regular exercise, healthy diet avoiding food with a high fat content, restricting caffeine and avoiding stress by having a good home/lifestyle and family understanding of the demands of such work.

- Adequate recognition must be made of day/night cycle influences in sleep architecture and daytime performance
- Provisions for management of excess fatigue should be instituted and include, but not be limited to:
 - 1) Shift duration, i.e. monthly hours in keeping with other Australian industries such as airlines.
 - 2) Peer support activities, including training of managers to identify fatigue-associated behaviour.
 - 3) Restriction of overtime to levels which avoid excessive fatigue.
 - 4) Prospective study of fatigue using objective measures to determine contributors that lead to fatigue and reduced performance in paramedics

Conclusion

Ambulance paramedics have a sometimes difficult and unique role within the community as they are challenged both physically and psychologically. Results from this pilot study suggest Australian paramedics are faced with poor sleep quality and that this deprivation translates into feelings of fatigue, tiredness and performing at suboptimal levels. Further research into

this area using a larger sample size is warranted in the hope of alleviating the problems faced and fostering a strong army of workers who have physical and emotional well-being.

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Appendix 1- Questionnaires

Project title: **Ambulance Paramedics and the Effects of Shift Work**

1. What is your age group? (please tick)

- <21 years
- 21-25 years
- 26-30 years
- 31-35 years
- 36-40 years
- 41-45 years
- >45 years

2. What is your gender? (please tick)

- Female
- Male

**3. How long have you been employed by an Ambulance Service as a shift worker?
(Shift work being defined as working any hours outside the standard of 8am to
5pm Monday through Friday)**

- <5 years
- 5-10 years
- 10-15 years
- 15-20 years
- > 20 years

4. Have you experienced fatigue in the last 6 months?

- Yes
- No

5. If so, what do you believe this is a result of?

6. Do you believe fatigue has affected your performance at work?

- Yes
- No

**7. Have you ever been diagnosed with narcolepsy, restless leg syndrome, obstructive
or central sleep apnoea?**

- Yes
- No

8. If so are you being treated for this?

- Yes
- No

Epworth Sleepiness Scale (Johns, 1991)

How likely are you to doze off or fall asleep in the following situations (rather than just feeling tired) - referring to your usual way of life in recent times. If you haven't done some of these things recently, try and work out how it would have affected you - so all questions have an answer.

Use the following scale to choose the most appropriate number for each situation

- 0 = no chance of dozing**
- 1 = slight chance of dozing**
- 2 = moderate chance of dozing**
- 3 = high chance of dozing**

SITUATION	CHANCE OF DOZING
1. Sitting and reading	_____
2. Watching television	_____
3. Sitting, inactive in a public place (eg. in cinema or a meeting)	_____
4. Passenger in a car for an hour without a break	_____
5. Lying down to rest in the afternoon (when circumstances permit)	_____
6. Sitting and talking to someone	_____
7. Sitting quietly after lunch (without alcohol)	_____
8. In a car, whilst stopped for a few minutes in traffic	_____

Berlin Questionnaire (for sleep apnoea) (Netzer et al., 1999)

Height _____ cm Weight _____ kg
Age _____ yrs Gender M / F

1. Do you snore?

- Yes
No
Don't know

If you snore:

2. Your snoring is...

- Slightly louder than your breathing
Louder than talking
As loud as talking
Very Loud

3. How often do you snore?

- Almost every day
3-4 times a week
1-2 times a week
Never or almost never

4. Does your snoring bother other people?

- Yes
No

5. Has anyone ever noticed that you quit breathing during your sleep?

- Nearly every day
3-4 times a week
1-2 times a week
1-2 times a month
Never or nearly never

6. How often do you feel tired or fatigued after you sleep?

- Nearly every day
3-4 times a week
1-2 times a week
1-2 times a month
Never or nearly never

7. During your wake time, do you feel tired, fatigued or not up to par?

- Nearly every day
3-4 times a week
1-2 times a week
1-2 times a month
Never or nearly never

8. Have you ever nodded off or fallen asleep while driving a vehicle?

- Yes
No

If yes:

9. How often does this occur?

- Nearly every day
- 3-4 times a week
- 1-2 times a week
- 1-2 times a month
- Never or nearly never

10. Do you have high blood pressure?

- Yes
- No
- Don't know

Pittsburgh Sleep Quality Index (PSQI) (Buysse et al., 1989)

The following questions relate to your usual sleep habits during the past month ONLY. Your answers should indicate the most accurate reply for the majority of days and nights in the past month. Please answer all questions.

1. **During the past month, when have you usually gone to bed at night?**
USUAL BED TIME _____
2. **During the past month, how long (in minutes) has it usually taken you to fall asleep each night?**
NUMBER OF MINUTES _____
3. **During the past month, when have you usually gotten up in the morning?**
USUAL GETTING UP
TIME _____
4. **During the past month, how many hours of *actual sleep* did you get at night?
(This may be different than the number of hours you spend in bed.)**
HOURS OF SLEEP PER NIGHT _____

For each of the remaining questions, check the one best response. Please answer all questions.

5. **During the past month, how often have you had trouble sleeping because you.....**
 - a) **cannot get to sleep within 30 minutes**
Not during the past month Less than once a week Once or twice a week Three or more times a week
 - b) **Wake up in the middle of the night or early morning**
Not during the past month Less than once a week Once or twice a week Three or more times a week
 - c) **Have to get up to use the bathroom**
Not during the past month Less than once a week Once or twice a week Three or more times a week
 - d) **Cannot breathe comfortably**
Not during the past month Less than once a week Once or twice a week Three or more times a week
 - e) **Cough or snore loudly**
Not during the past month Less than once a week Once or twice a week Three or more times a week
 - f) **Feel too cold**
Not during the past month Less than once a week Once or twice a week Three or more times a week
 - g) **Feel too hot**
Not during the past month Less than once a week Once or twice a week Three or more times a week
 - h) **Had bad dreams**
Not during the past month Less than once a week Once or twice a week Three or more times a week

i) Have pain

Not during the past month Less than once a week Once or twice a week Three or more times a week

j) Other reason(s), please describe _____

How often during the past month have you had trouble sleeping because of this?

Not during the past month Less than once a week Once or twice a week Three or more times a week

6. During the past month, how would you rate your sleep quality overall?

Very good
Fairly good
Fairly bad
Very bad

7. During the past month, how often have you taken medicine (Prescribed or "over the counter") to help you sleep?

Not during the past month Less than once a week Once or twice a week Three or more times a week

8. During the past month, how often have you had trouble staying awake while driving, eating meals, or engaging in social activity?

Not during the past month Less than once a week Once or twice a week Three or more times a week

9. During the past month, how much of a problem has it been for you to keep up enough enthusiasm to get things done?

No problem at all
Only a very slight problem
Somewhat of a problem
A very big problem

10. Do you have a bed partner or share a room?

No bed partner or do not share a room
Partner/ flat mate in other room
Partner in same room, but not same bed
Partner in same bed

11. If you have a bed partner or share a room, ask him/her how often in the past month you have had.....

a) Loud snoring

Not during the past month Less than once a week Once or twice a week Three or more times a week

b) Long pauses between breaths while asleep

Not during the past month Less than once a week Once or twice a week Three or more times a week

c) Legs twitching or jerking while you sleep

Not during the past month Less than once a week Once or twice a week Three or more times a week

d) Episodes of disorientation or confusion during sleep

Not during the past month Less than once a week Once or twice a week Three or more times a week

e) Other restlessness while you sleep: please describe _____

Not during the past month Less than once a week Once or twice a week Three or more times a week

Beck Depression Inventory (Beck et al., 1961)

Choose one statement from among the group of four statements in each question that best describes how you have been feeling during the **past few days**. Circle the number beside your choice.

1	<p>0 I do not feel sad. 1 I feel sad. 2 I am sad all the time and I can't snap out of it. 3 I am so sad or unhappy that I can't stand it.</p>	9	<p>0 I don't have any thoughts of killing myself 1 I have thought of killing myself, but I would not carry them out 2 I would like to kill myself 3 I would kill myself if i had the chance</p>
2	<p>0 I am not particularly discouraged about the future 1 I feel discouraged about the future 2 I feel I have nothing to look forward to. 3 I feel that the future is hopeless and that things cannot improve.</p>	10	<p>0 I don't cry more than usual 1 I cry more now than I used to 2 I cry all the time now 3 I used to be able to cry, but now I can't cry even though I want to</p>
3	<p>0 I don't not feel like a failure 1 I feel I have failed more than the average person 2 As I look back on my life, all i can see is a lot of failure 3 I feel I am a complete failure as a person</p>	11	<p>0 I am no more irritated by things than I ever am 1 I am slightly more irritated now than usual 2 I am quite annoyed or irritated a good deal of the time 3 I feel irritated all the time now</p>
4	<p>0 I get as much satisfaction out of things as I used to 1 I don't enjoy things the way I used to 2 I don't get any real satisfaction out of anything anymore 3 I am dissatisfied or bored with everything</p>	12	<p>0 I have not lost interest in other people 1 I am less interested in other people than I used to be 2 I have lost most of my interest in other people 3 I have lost all of my interest in other people</p>
5	<p>0 I don't feel particularly guilty 1 I feel guilty a good part of the time 2 I feel quite guilty most of the time 3 I feel guilty all of the time</p>	13	<p>0 I make decisions about as well as i ever could 1 I put off making decisions more than I used to 2 I have greater difficulty making decisions than before 3 I can't make decisions at all anymore</p>
6	<p>0 I don't feel I am being punished 1 I feel I may be punished 2 I expect to be punished 3 I feel I am being punished</p>	14	<p>0 I don't feel that I look any worse than I used to 1 I am worried that I am looking old or unattractive 2 I feel that there are permanent changes in my appearance that make me look unattractive 3 I believe that I look ugly</p>
7	<p>0 I don't feel disappointed in myself 1 I am disappointed in myself</p>	15	<p>0 I can work about as well as before 1 It takes an extra effort to get started</p>

	<p>2 I am disgusted with myself 3 I hate myself</p>		<p>at doing something 2 I have to push myself very hard to do anything 3 I can't do any work at all</p>
8	<p>0 I don't feel I am any worse than anybody else 1 I am critical of myself for my weaknesses or mistakes 2 I blame myself all the time for my faults 3 I blame myself for everything bad that happens</p>	16	<p>0 I can sleep as well as usual 1 I don't sleep as well as I used to 2 I wake up 1-2 hours earlier than usual and find it hard to get back to sleep 3 I wake up several hours earlier than I used to and cannot get back to sleep</p>
17	<p>0 I don't get more tired than usual 1 I get tired more easily than I used to 2 I get tired from doing almost anything 3 I am too tired to do anything</p>	20	<p>0 I am no more worried about my health than usual 1 I am worried about physical problems such as aches and pains, or upset stomach, or constipation 2 I am very worried about physical problems, and it's hard to think of much else 3 I am so worried about my physical problems that I cannot think about anything else</p>
18	<p>0 My appetite is no worse than usual 1 My appetite is not as good as it used to be 2 My appetite is much worse now 3 I have no appetite at all anymore</p>	21	<p>0 I have not noticed any recent change in my interest in sex 1 I am less interested in sex than I used to be 2 I am much less interested in sex now 3 I have lost interest in sex completely</p>
19	<p>0 I haven't lost much weight, if any, lately 1 I have lost more than 2 kilograms 2 I have lost more than 5 kilograms 3 I have lost more than 8 kilograms (Score 0 if you have purposely been trying to lose weight)</p>		