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The Correlation between Perceived Stress, Anxiety, Depression and Body Mass Index (BMI) of Pharmacy Staff in Miri Hospital

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ABSTRACT

Introduction: Prolonged stress could overwhelm one's mental health. Major depressive disorder and anxiety disorder ranked in top ten for causes of Disability Adjusted Life Years (DALYS). Sarawak comes in fifth states with the highest number of severe depression case detected at primary health care in the year 2014.

Objective: This study aims to assess the degree of perceived stress, anxiety and depression among staffs in the pharmacy department of Miri Hospital as well as to observe the correlation between body mass index (BMI) and perceived stress, anxiety and depression.

Methods: We conducted a cross-sectional study covering 74 staff in the pharmacy department of Miri Hospital. A combined validated questionnaire on perceived stress scale (PSS-10) and hospital anxiety and depression scale (HADS) distributed for assessment. Participants' self-reported body weight (kg) and height (cm) used to calculate their body mass index (BMI). Pearson's correlation used to evaluate the correlation between perceived stress, anxiety and depression on body mass index (BMI).

Results: Majority of the participants, 75.7% (n=56) has moderate stress, and 5.4% (n=4) reported high degree of perceived stress. About two-third of pharmacy staff have a normal degree of anxiety (62.2%, n=46) and depression (79.7%, n=59). It noted that 12% (n=9) and 8% (n=6) of the staff have an abnormal degree of anxiety and depression respectively. Pearson's correlation shown that there was a high degree of correlation coefficient (r) between perceived stress and anxiety (r: 0.709), as well as between perceived stress and depression (r=0.549). There was a similarly strong association between anxiety and depression with a correlation coefficient of 0.621. The study also proved that there was a poor correlation between BMI and perceived stress, anxiety and depression.

Conclusion: Our study concluded that there is no relation between BMI and perceived stress, anxiety and depression. However, high perceived stress would lead to anxiety as well as depression. Also, there is a correlation between anxiety and depression.

Keywords: Perceived stress, anxiety, depression, body mass index

INTRODUCTION

Stress is an experience when environmental demands exceed an individual's adaptive capacity (1). Perceived stress is the feelings or thoughts regarding the uncontrollability and unpredictability events, how often one has to deal with irritations and changes in life, and the ability to deal with difficulties (2). When the source of stress is constant and stress response becomes prolonged (chronic), it will negatively impact one's attention, memory, and emotions. This long-term stress can contribute to both physical and mental illness through effects on digestive, heart, and immune and metabolic functions (2). Furthermore, overactivity of the body's stress response mechanism potentially leads to changes in levels of hormones such as cortisol, serotonin and other neurotransmitters in the brain which subsequence can be allied to mental health (2).

Mental health disorder is a significant health problem throughout the world. According to first Global Burden of Disease Study (GBOD 1990), neuropsychiatric disorders accounted for 10.5% of Disability Adjusted Life Years (DALYS); major depressive disorder was in the top three causes of burden and anxiety disorder was the tenth cause (3). Based on National Health Morbidity Survey 2011, the prevalence of lifetime depression and current depression in Malaysia were 2.4% and 1.8% respectively. Prevalence of generalised anxiety disorder (GAD) among the adult sixteen years old and above was 1.7%. Sarawak comes in fifth states with the highest number of severe depression case detected at primary health care in the year 2014 (3).

Khan S. et al. (2017) used the physiology of stress to explain the connection pathway between stress and mental illness. He described stressful events could trigger two systems; sympathetic adreno-medullary (SAM) system and hypothalamic-pituitary-adrenocortical (HPA) axis. Stimulation of both systems arouses release of certain hormones (e.g. catecholamine, corticotrophin-releasing hormone, adrenocorticotrophic hormone) in the human body which further contribute to signs and symptoms of anxiety and depression. However, the correlation between perceived stress and anxiety as well as depression are not absolute (4).

Both Vaida L.et al (2015) and Racic M et al. (2017) revealed, there is a highly positive correlation between perceived stress and mental health issues. The studies proved that higher levels of perceived stress predispose the participants for anxiety and lower quality of life (5,6). Another

similar study done by Guruprakash KV et al. (2018) concluded, higher scores on perceived stress among highly educated medical students were associated with higher scores on general psychopathology and burnout (Depression anxiety syndrome). The study also looked into the coping pattern of each participant, and the result showed that those residents who displayed positive coping strategies had lesser perceived stress scores and vice versa (7).

Likewise, Wei L. et al. (2003) concluded a strong correlation between perceived stress, depression and anxiety among college students. However, it stated a significant negative correlation between perceived social support and perceived stress; regardless of perceived stress scores, students with higher social support have less depression and anxiety (8).

Last but not least, psychosocial stress has been strongly implicated in the biology of adiposity, but epidemiology studies have produced inconsistent results. Based on a meta-analysis of longitudinal studies done by Wardle J. et al. (2011) where analyses from the total of 14 cohorts were collected and evaluated, reported majority of the analyses found no significant relationship between stress and adiposity (69%). However, among those with significant effects, more found positive than negative association, 25% and 6% respectively. Psychosocial stress is a risk factor for weight gain but the effect is minimal (9). Following this meta-analysis, there were other studies done with conflict outcomes (10,11).

However, the result of studies concerning the association between obesity and depression as well as anxiety are conflicting (13). A nonlinear correlation between anxiety scores and bosy mass index (BMI) as well as depression scores and BMI observed in two different studies; both studies revealed to have a significant inverted U-shaped association. Lower anxiety scores both for lower and higher BMI indices, and higher anxiety scores for medium BMI indices (12). In contrast, another study revealed that both obesity and underweight are associated with an increased level of depression (13).

In conclusion, growing mental problems can affect anyone and should not be ignored. Thus, it is essential to assess the degree of perceived stress, anxiety and depression among healthcare staff in the pharmacy department of Miri Hospital in order to extend the study on its remedy or coping

strategies. The second objective is to examine the correlation between staff's perceived stress, anxiety and depression on BMI.

METHODS

A cross-sectional study was carried out in the pharmacy department of Miri Hospital. The target population were those above 18 years old, without the language barrier to the questionnaire and working in the pharmacy department of Miri Hospital. The sample size of the study was 74 where those fully registered pharmacists (FRP), provisional registered pharmacist (PRP) and pharmacist assistants who fulfil the inclusion criteria recruited in this study.

We distributed the validated questionnaire on perceived stress scale (PSS-10) and hospital anxiety and depression scale (HADS). A written consent form was attached to a questionnaire. All the participants requested to fill up their socio-demographic details as well as their self-reported body weight (kg) and height (cm). The questionnaire distributed would be collected one week later.

Perceived stress scale (PSS-10) consists of 10 validated questions (refer Appendix 1) (14). The degree of stress based on the scoring; 0-13 indicates low stress; 14-26 indicates moderate stress and 27-40 indicates high stress. The hospital anxiety and depression scale (HADS) consists of a total of 14 questions (7 questions for each) (refer Appendix 2) (15). The degree of anxiety and depression will depend on the scoring; 0-7 shows a normal degree of struggle, 8-10 shows borderline abnormal and higher scoring of 11-21 shows the abnormal degree of anxiety or depression. Participant's BMI (kg/m^2) calculated using the formula; weight (kg) over height in meter square (m^2).

The demographic profile of respondents described as frequencies and percentages for categorical variables. Age was described as the median and interquartile range (IQR), whereas other numerical variables summarised as mean and standard deviation (SD). Pearson's correlation analysis used to evaluate the correlation between perceived stress, anxiety and depression on BMI. All of the data analysis performed using SPSS version 21.

RESULTS

The study involved 74 of participants from the pharmacy department of Miri Hospital. The participants have a median age of 31. Most of the participants are female (82.4%, n=61), mostly Chinese (67.6%, n=50) and had working experience of 6-10 years (35.2%, n=26). The average body weight and height of all participants were 60.0kg and 1.62m, respectively, with a mean BMI of 22.82kg/m^2 as shown in Table 1.

Table 1. Demographic Data of Respondents (n=74)

Characteristics	Frequency (%)	Mean (SD)
Age (years)		* 31 (6)
Gender		
Male	13 (17.6)	
Female	61 (82.4)	
Ethnicity		
Malay	12 (16.2)	
Chinese	50 (67.6)	
Indian	1 (1.4)	
Others	11 (14.0)	
Working experience (years)		
≤1	16 (21.6)	
2 – 5	16 (21.6)	
6 – 10	26 (35.2)	
≥ 11	16 (21.6)	
Bodyweight (kg)		60.10 (13.41)
Height (cm)		1.62 (0.07)
BMI (kg/m^2)		22.82 (4.23)

* Median (IQR)

There was a high degree of perceived stress reported by 5.4% (n=4) of participants, but the majority of participants involved had either a moderate (75.7%, n =56)) or low degree (18.9%, n=14) of stress, as shown in Table 2. There was a tendency towards high-stress ratings by PRP who has less than one year of working experience in Miri Hospital. However, the study had shown some participants who worked for several years also reported moderate to a high level of perceived stress. From the study, it had demonstrated that the majority of the participants do not have anxiety and depression health problem. Table 3 shows the degree of anxiety and depression among

pharmacy staffs in Miri Hospital. Approximately 12.2% (n=9) and 8.1% (n=6) of 74 participants had an abnormal degree of anxiety and depression respectively. Most of the staffs involved in a borderline abnormal or abnormal degree of depression were female.

Table 2. Degree of Perceived Stress Assessed by Ten Questions in the Perceived Stress Scale (PSS-10)

Degree	Perceived stress (n, %)
Low stress	14 (18.9)
Moderate stress	56 (75.7)
High stress	4 (5.4)

Table 3. Degree of Anxiety Assessed by Ten Questions in the Perceived Stress Scale (PSS-10)

Degree	Anxiety (n, %)	Depression (n, %)
Normal	46 (62.2)	59 (79.7)
Borderline abnormal	19 (25.7)	9 (12.2)
Abnormal	9 (12.2)	6 (8.1)

The Pearson analysis in Table 4 had shown that there was a high degree of correlation coefficient (r) between perceived stress and anxiety (r=0.709) and between perceived stress and depression (r=0.549). There was also a strong association between anxiety and depression with a correlation coefficient of 0.621. Overall of the result in table 4 had proven that there was no correlation between BMI and perceived stress, anxiety and depression. The result had shown value less than 0.3 which means the degree of correlation was low.

Table 4. Correlation between Perceived Stress, Anxiety, Depression and BMI

	Perceived Stress	Anxiety	Depression	BMI
Perceived Stress				
Anxiety	0.709			
Depression	0.549	0.621		
BMI	0.036	0.007	0.142	

DISCUSSION

The current study assessed the degree of perceived stress, anxiety, depression and their association with body mass index (BMI) among pharmacy staffs in Miri Hospital. As shown in Table 2, the majority of the participants had perceived moderate stress (75.7%) and only 5.4% of them perceived a high degree of stress, which is consistent with the results of other study done by Racic M et al. (2017) demonstrating health profession students exposed to stress (6). The reported prevalence of stress in Malaysia was between 6.0% and 71.7%. The nature of the pharmacy profession itself involves typically dealing with illness, patient suffering, managing difficult jobs and different demands from work. It indirectly can affect their physical and mental health when they do not manage their stress well (16).

Perceived stress was significantly associated with anxiety and depression, as shown in Table 4, which supported with an observational study by Weigner L et al. (2015) for a group of the working-age population. Symptoms of anxiety and depression often accompany a high level of perceived stress (17). Following this study done by Racic M et al. (2017), a high and significant correlation between perceived stress and anxiety level among all healthcare professionals (medical students, dentistry and nursing students) found in the study. The high trait of anxiety actually can cause a person to have a greater sense of stress, primarily when they aim towards self- esteem (6).

Occupational stress experienced by working adults here can affect their quality of life and impair their cognitive functioning. In other words, increased of perceived is associated with risk of getting depression (6). Majority of the pharmacy staffs in Miri Hospital who fall into the category of a borderline abnormal and abnormal degree of depression were women, which is similar with the observational study for working-age population done by Lilian W et al. (2018), where depression was twice as typical among women as among men, therefore more likely to report higher stress level. Generally, women are more likely to self-report health-related problems than men and men seek medical care to a lower extent than women (17).

Pearson's correlation analysis showed a strong correlation between anxiety and depression among pharmacy staffs in Miri Hospital. Living in a constant state of anxiety can make someone feeling hopeless and meaningless life, which creates another pathway to depression (16). However, the

participants in this study under the category of abnormal anxiety and depression were minimal, thus is most probably because the majority of them have long working experience, well-educated and able to handle their mental health problem wisely. Those who step into the category of the abnormal degree of anxiety and depression caused by an overload of work, fear of error, time pressures and lack of social support (18).

Overall of this study had proven that there was a mild correlation between BMI and perceived stress, as shown in table 4. Psychological stress suspected to affect BMI when it is associated with sleeping status, eating behaviour, insufficient physical activity and coping strategies against stress. A good coping strategy and controlling of lifestyle can reduce the stress hormone or cortisol in our body, which then reduces the accumulation of triglycerides in adipocytes and prevents from getting obesity (10). Most of the pharmacy staffs here are aware of the importance of having a healthy diet, lifestyle and coping strategies against stress. Thus, the correlation between BMI and perceived stress among pharmacy staffs in Miri Hospital is not substantial.

The study had shown that there was no significant association between BMI and depression among pharmacy staffs in Miri Hospital. The results presented that depression symptoms in obesity were lower than normal and underweight participants. Nevertheless, the number of participants in the category of obese was limited and strength for this association is not clear. There was also a poor correlation between BMI and anxiety in this study. Some of the thin staffs had higher anxiety symptoms compared with obese ones, that are consistent with the result in a study done by Maryam J et al. (2017) (19).

LIMITATION

This study has several limitations. This is asingle-centred study and the number of participants recruited in this study is relatively small. These participants were all staffs working in the healthcare sector. Given the possibility of a higher degree of awareness on mental health, participants could have a better way of coping stress, anxiety, and depression as well as keeping themselves at healthy body weight. Therefore, the relationship between perceived stress, anxiety, depression and BMI could possibly not reflected in this study due to the possibility of a suitable coping mechanism.

CONCLUSION

Findings from this study showed good correlation between perceived stress and anxiety as well and perceived stress and depression. However, the study showed a weak correlation between BMI and perceived stress, anxiety and depression among pharmacy staff in Miri Hospital. Continuous education on mental health is required and awareness on developing skill on coping mental related issues is needed. Future study may study the mechanism and coping strategies among healthcare professionals.

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