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Prevalence of depression and its associated factors among persons with chronic medical illness in Bhutan

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ABSTRACT

This study aimed to determine the prevalence of depression and factors associated with the depression among persons with chronic medical illness. A total of 120 adult patients visited at a medicine OPD hospital in Bhutan were recruited and asked to complete self-report questionnaires. Descriptive statistics and binary logistic regression were employed to analyze the data. Results revealed 41% of the prevalence rate of depression in persons with chronic medical illness in Bhutan. Patients' age ≤ 40 years, being a female, and those with low level of physical activity and low social support were significantly associated with depression. Nurses and related health care providers could utilize these findings to develop an intervention to prevent depression in persons with medical chronic illness by promoting social support and physical activity focusing on females, and young adults.

Introduction

Depression affects hundreds of millions of people all over the world. One in six people has experienced depression at some times in their life. The total number of people with depression is estimated about 322 million worldwide and nearly 86 million people in South-East Asia Region. A number of people living with depression are increased by 18% between 2005 and 2015 (World Health Organization [WHO], 2017). The increasing prevalence and the serious impact of depression all over the world make it become one of the most serious public health problems of the 21st century (Boing et al., 2012).

The National Institute of Mental Health (NIMH, 2019) reported that people with medical illness have increased risk of depression. It shows that about 10–65% of people with medical conditions became depressed during the time of their illness (Cleveland Clinic, 2019). Several studies reported increased prevalence of depression in individuals diagnosed with medical illnesses mostly in cardiovascular disease, diabetes mellitus, chronic obstructive pulmonary disease, arthritis and chronic pain, asthma and cancer (Hare, Toukhsati, Johansson, & Jaarsma, 2013; Khuwaja et al., 2010; Matcham, Rayner, Steer, & Hotopf, 2013; Tsai et al., 2013). Consequently, it increases the morbidity and mortality, worsens the prognosis for the patient, and reduces the capacity for self-management, which increases the risk of major health complications in patients with chronic medical illness (Goldberg, 2010; Katon, 2011).

Currently, Bhutan is undergoing rapid urbanization and this has led to an increase in mental disorders in the country. It was found that from 2011 to 2015, there was an increase in the total number of cases of mental health disorders, from 2878 cases to 7004, of which 31% was depression (Dorji et al., 2017). Along with that a number of people with chronic medical illness in the country are also increasing drastically. Medical illnesses such as diabetes, cardiovascular diseases, cancer and chronic obstructive pulmonary diseases are also on the rise in the Bhutanese population. Despite the increase in number of both depression and chronic illness in Bhutan, there is limited information regarding depression in chronic medical illness.

From the review of literature of previous studies on depression in chronic medical illness, factors such as disease characteristics, some sociodemographic factors (age, gender), duration and number of illness, physical activity and social support have shown to be related to depression in chronic medical illness. Studies reported that patients with age 50 years or more with diabetes were more likely to associated with depression than those < 50 years of age (Khuwaja et al., 2010; Téllez-Zenteno & Cardiel, 2002). However, a study of depression in Taiwanese COPD patients reported higher hazard for depression in younger patients than the elderly (Tsai et al., 2013), and so did a study about heart failure patients (Gottlieb et al., 2004). Depression in COPD female patients were at a 1.19 fold greater risk for depression than men (Tsai

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et al., 2013). They also reported that depression was higher within one year after diagnosis and concluded that the newly diagnosed COPD patients may be highly fragile and vulnerable to depressive symptom. Prevalence of depression was 1.44 times higher among those reporting one chronic disease and 2.25 times higher among those reporting two or more diseases than among those with no diseases (Boing et al., 2012). Prevalence of depression increased with increasing number of chronic physical conditions (Gunn et al., 2012). Most evidence indicates that physical activity improves mood and reduces the risk of depression. No physical activity was significantly associated with depression in persons with diabetes. In addition, having a few or no supportive relationships can increase the risk of depression. Not living with spouse was associated with depression among patient with diabetes (Khuwaja et al., 2010). A study reported that being widowed and divorced persons are associated with the presence of depression in diabetic patients, and being married was a protective factor (Téllez-Zenteno & Cardiel, 2002).

People with chronic medical illness may present with a high prevalence of depression, several factors are found to be related with depression among medical illness patients, and thus health professionals working in a diverse range of settings involve in the care and management of people with this conditions. Therefore, recognition of this association is important in the holistic management of patients with chronic medical illness. This study aimed to examine the prevalence and determine the association between depression and factors, including age, gender, duration of illness, number of medical illness, physical activity, and social support among persons with chronic medical illness in Bhutan.

Materials and methods

A descriptive correlational predictive study was conducted at a general hospital in Thimphu, Bhutan. Data were collected from March to April 2018.

Bhutan is a tiny kingdom nestling in the Himalayas with a land area of 38,394 km^2 and a population of 0.78 million (Wikipedia, 2018). People in Bhutan can avail health care services for free of charge. Thimphu is the capital city of Bhutan located in the western part of the country. It is the most densely populated region of the country with people residing from all across the country. JDWNRH is the only national referral hospital of the country. Along with that, it also functions as Regional Referral Hospital for the western regions of the country.

Participants

Bhutanese adults who were diagnosed with chronic medical illness and visit the medical outpatient department of a general hospital in Thimphu, Bhutan for follow-up in 2018 was the target population. The sample size was calculated based on Throndike's recommendation (Throndike, 1978) to obtain the study power analysis of 0.80 in regression analysis. A simple random sampling technique was used to recruit 120 participants from the target population who met the study inclusion criteria; age between 18 and 65 years, be able to read and write English, never been diagnosed with any mental health problem by psychiatrist or psychologist, and diagnosed with chronic medical illness of diabetes mellitus, cardiovascular diseases, chronic obstructive pulmonary disease, hypertension or arthritis for > 6 months.

Research instruments

There were 4 self-report questionnaires which were directly filled by the participants directly in English from the versions.

A demographic questionnaire was used to collect the participants' personal information, health and medical records. It consists of age, gender, marital status, education level, occupation, monthly income in Bhutanese Ngultrum (BTN) currency (1 USD~75 BTN), duration of the illness and number of medical illnesses.

The Patient Health Questionnaire (PHQ-9) (Kroenke, Spitzer, & Williams, 2001) based on the DSM-IV depression diagnostic criteria with other leading major depressive symptoms into a brief self-report tool. It contains 9 item of 4 rating scores of 0 = not at all, 1 = several days, 2 = more than half of the days and 3 = nearly every day. They are summed to be a total score ranged from 0 to 27. The level of depression interpreted as minimal (0–4), mild (5–9), moderate (10–14), moderately severe (15–19) and severe (20–27). A total score of 5 or more is considered as depression. The PHQ-9 also has been used in many studies in primary care settings, as well as with older individuals and with those who have physically disabling conditions. It has been used in many clinical populations such as stroke, cardiology, spinal cord injury and general medical outpatients to assess depression (Spearing & Bailey, 2012). It is free to users and available in English and over 30 other languages. Its Cronbach's alpha reliability was 0.90.

The Global Physical Activity Questionnaire (GPAQ) (WHO, 2002) consists of 16 questions to estimate an individual's level of physical activity in three domains of activity at work (6 items), transport to and from places (3 items) and recreational activities (6 items). The last part deals with the time spent on sedentary behavior (1 item).

Metabolic Equivalents (METs) are used to analyze the GPAQ data and to express the intensity of physical activities. MET is the ratio of a person's working metabolic rate relative to the resting metabolic rate. One MET is defined as the energy cost of sitting quietly, and is equivalent to a caloric consumption of 1 kcal/kg/h. For interpretation we calculate minutes per week spent in moderate and vigorous activities, as well as the sum of both intensities (moderate-to-vigorous physical activity). Then we convert it into MET as per the GPAQ guideline. It is estimated that, compared to sitting quietly, a person's caloric consumption is four times as high when being moderately active, and eight times as high when being vigorously active. Therefore, when calculating a person's overall energy expenditure using GPAQ data, 4 METs are assigned to the time spent in moderate activities (4× physical activity in minutes per week), and 8 METs to the time spent in vigorous activities (8× physical activity in minutes per week). WHO recommendation for physical activity throughout a week, including activity for work, during transport and leisure time is at least 75 min of vigorous-intensity physical activity, 150 min of moderate-intensity physical activity, and an equivalent combination of moderate- and vigorous-intensity physical activity achieving at least 600 MET-minutes per week. In this study, its test-retest reliability with 2 weeks apart was 0.88.

The Medical Outcomes Study Social Support Survey (MOS-*SSS*) (Sherbourne & Stewart, 1991) is a 19 item self-administered, consists of four domains; emotional/informational support (8 items), tangible support (4-items), affectionate support (3 items) and positive social interaction (3 items), and the last additional 1 item. The answers range from 1 = none of the time, 2 = a little of the time, 3 = some of the time, 4 = most of the time and 5 = all of the time. A higher score for an individual scale or for the overall support index indicates more support. The MOS survey appears to be easy to administer to chronically ill patients and the items are short and simple. Its Cronbach's alpha reliability was 0.93.

Ethical consideration

The study proposal and all research instruments were approved by the IRB committee of Faculty of Nursing, Burapha University Thailand (IRB code # 03-12-2560), and the Research Ethical Board of Ministry of Health, Bhutan (IRB code # 2018/003). All the participants were informed regarding the purpose of the study and the procedure. Their participation in the study was on voluntary basis and their decision to withdraw from the study was respected. Informed consent was obtained from each participant prior to data collection. Confidentiality was maintained and no names were disclosed in the research report. All data

were stored in a specific file using specific password and only the researchers have access to it. The data will be destroyed completely after publication of the study findings.

Data collection procedures

After obtained IRB approval, procedures for data collection were discussed with health workers in the medical outpatient department. The researcher presented at the medical outpatient department to collect the data from 8:30 a.m. to 3:00 p.m., then explained to the target participants about the purpose, method and confidentiality of the study as well as how to respond to the questionnaires and asked them fill the questionnaire in the private room provided. Each participant took approximately 30 min to complete all questionnaires. The researcher checked for completeness of the answers before the participant left.

Data analysis

Data were analyzed by using the Minitab (version 18) statistical software program. Descriptive statistics including frequency, percent, mean and standard deviation was used to describe the demographic characteristics of the sample and the study variables. Binary logistic regression analysis was performed to determine association of age, gender, duration of illness, number of chronic medical illness, physical activity, social support and depression in persons with chronic medical illness. An alpha level of $p < .05$ was set as a level of significance for the study and 95% confidence interval were calculated.

Results

Of the 120 participants, most of them were female (59.2%). Their age ranged from 18 to 64 years with a mean of 44.17 (SD = 12.67). About 73.3% were married. More than half of them (65%) completed an educational level of primary school while only 4.2% has a university level of education. About 39.2% had occupations of housewives, farmers and business, followed by 22.5% working in private sectors and 21.7% in government services. Their average monthly income was 13,570.42 BTN (approximately 180 USD). About 42% had hypertension followed by diabetes mellitus (30.8%), and Chronic Obstructive Pulmonary Disease (5.8%). Most participants had one chronic medical illness (78.3%) while 21.7% had a combination of hypertension and diabetes. The duration of chronic medical illness ranged from 6 to 408 months with a mean of 88.13 (SD = 88.50).

The prevalence of depression in the sample was 41%. The total mean score for physical activity was 2315.8 (SD = 1764.1) with a range of 0–7680, indicating a moderate level of physical activity in the sample. The total mean score for social support was 63.51 (SD = 13.69).

Factors associated with depression in chronic medical illness

Binary logistic regression analysis was used to analyze the prediction. Hosmer-Lemeshow test showed a $p > .05$ (0.70) indicating that the model is fit for prediction. The results revealed that factors associated with depression in chronic medical illness were age, gender, physical activity and social support when controlled for each other. Table 1 presented that patients' age 40 years or younger were more likely to have depression than those who are over 40 years of age with adjusted odds ratio (adj. OR = 0.24, $p < .01$, 95% CI = 0.091–0.631). Being a female was associated with depression (adj. OR = 0.26, $p < .0$, CI = 0.097–0.700). Patients with low level of physical activity were more likely to be depressed than those with high physical activity (adj. OR = 0.138, $p < .01$, CI = 0.040–0.473). Social support was negatively associated with depression in chronic medical illness (adj. OR = 0.930, $p < .05$, CI = 0.930–1.00). Number and duration of illness were not associated with the depression.

Table 1
Binary logistic regression analysis of likelihood of depression (n = 120).

Variables	β	p	Odds ratio	95% C.I.
Age (> 40 years)	−1.43	.003	0.24	0.09–0.63
Gender (male)	−1.35	.005	0.26	0.09–0.70
Number of illness	0.30	.642	1.35	0.37–4.90
Duration of illness (< 12 months)	−0.13	.853	0.88	0.22–3.45
Physical activity (high)	−1.99	.001	0.14	0.04–0.47
Social support	−0.04	.042	0.96	0.93, 0.99
Constant	4.73	.000	113.392	

Discussion

The prevalence of depression among Bhutanese persons with chronic medical illness was about 41% (PHQ ≥ 5) ranging from mild to moderately severe depression. It is consistent with other studies of depression done in diabetic patients in Middle East and Mexico which reported 40.2% and 40% (Sweileh, Abu-Hadeed, Al-Jabi, & Sa'ed, 2014; Tovilla-Zarate et al., 2012). Another study on the prevalence of undiagnosed depression among patients with diabetes in outpatient in a neighboring country Nepal reported 40% depression which is also consistent with this study (Neupane et al., 2015). There are possible reasons which might have contributed to the high prevalence among the sample. In this study, majority of the participants had primary level of education (65%). Therefore, their lack of knowledge regarding the disease treatment and prognosis might have contributed to the prevalence of depression. This was also supported by a study which revealed similar findings stating that the prevalence of depression is higher in those with low levels of education (Shi et al., 2014). The findings in the current study revealed that majority of the participants have hypertension (41.6%) and diabetes (30.8%) which were congruent with a study by Egede (2007) reported that the rate of 12 month prevalence of depression in hypertension is 8% and in diabetes is 9.3%.

It was found that females are more likely to suffer from depression in chronic medical illness than males and the result was consistent with the previous studies (Khuwaja et al., 2010; Neupane et al., 2015). A similar finding was also reported by a study on the pattern of psychiatric admissions in a referral hospital in Bhutan which reported that those admitted for depression were mostly females (Pelzang, 2012). Weaver and Hadley (2011) in their study of depression and anxiety in female diabetic patients in a developing country in Asia found that difficulties in achieving socially important roles contributed to depression. In Bhutan it is very common for women to be left at home alone to tend to both home duties and the farm and in the current study majority of the participants were housewives or farmers.

Though, many studies revealed that depression in chronic medical illness is more in older adults, the current study found that patients with age 40 years or younger were more likely to have depression than those who were > 40 years of age. It was consistent with other studies by Tsai et al. (2013) and Wolfe and Michaud (2009) where they found out that there is higher incidence of depression in younger age compared to the older age patients with Chronic Obstructive Pulmonary Disease and rheumatoid arthritis respectively. This is further supported by Kessler et al. (2007) where they said that the mean onset of depression is between 20 and 50 years. The younger patients report that the illness interferes with their day to day activities and are unable to accept whereas in the older adults they are able to accept the situation. This may be because as one ages, experiencing of negative affect declines and they become less reactive to stressor. This is supported by a study on emotional experience and age which reported higher levels of positive affect among older adults compared to younger adults (Carstensen et al., 2011).

A person with chronic medical illness with low level of physical activity is more likely to be depressed than those with high level of physical activity and was supported by other studies which found that a

lower level of moderate and vigorous physical activity were associated with higher rates of depression (Bishwajit et al., 2017). Having an illness can limit the physical activity due to pain and discomfort and this increases the likelihood of depression. This was supported by a review article on adults with type 2 diabetes for depression which reported that those who engage in < 30–90 min of exercise per week are 72%–75% were more likely depressed than those who were more active (Lysy, Da Costa, & Dasgupta, 2008).

Those with low score of social support was found more likely to be depressed than those with high score of social support and was consistent with a study which reported similar finding (Nan et al., 2012). This was also supported by a study which stated that there is an inverse relationship between the occurrence of depressive symptoms and the size of social networks (Rashid & Tahir, 2015). The presence of an illness, pain from illness and other conditional factors related to illness makes a person isolate themselves from the society and avoid social gatherings and interact less with friends and family and this might have contributed to depressive symptoms. This was further supported by a study which found that social isolation due to pain and disability was one of the reasons which lead to high depression in chronic illness patients (Turner & Kelly, 2000). This finding suggests that the health care providers need to promote social support in patients with chronic medical illness.

Duration of illness was not associated with depression in chronic medical illness in this study and was consistent with a study of depression in diabetic patients in Middle East, which reported that there was no significant association between depression and duration of illness (Sweileh et al., 2014). However several other studies reported that increased duration of the disease is known to significantly increase the risk of developing depression due to increased complications and health care expenditures (Khuwaja et al., 2010; Tovilla-Zarate et al., 2012), whereas another study by Tsai and his colleagues in COPD patients found that the depression was higher within one year after diagnosis (Tsai et al., 2013).

Number of chronic illness was also found to have no association with the depression. This was inconsistent with other studies where they found that the prevalence of depression increased with increasing number of chronic illness (Boing et al., 2012; Gunn et al., 2012). The inconsistency in the result can be explained by the fact that there were not many variations in number of illnesses in the current study. The maximum frequency of patients had one illness (78.3%), two illnesses (20.8%) and three illnesses (0.8%). Since the frequency of number of illness is less, there is less complication and better health outcomes, variance in depression might not have been predicted.

Conclusion and Implication for nursing practice

A surprisingly high prevalence of depression in chronic medical illness in Bhutanese population is found in this study. Patients who are younger than forty years, females, patients with low level of physical activity and with low social support were more likely to have depression. Therefore nurses and related health care providers could utilize these findings to develop an intervention to promote social support and physical activity in persons with chronic medical illness focusing on females and young adults. Consequently, minimizing depression among these persons could be effectively achieved.

Limitations and recommendation for future research

The sample was Bhutanese persons with five chronic medical illnesses (Hypertension, Diabetes, Cardiovascular disease, Chronic Obstructive Pulmonary Disease and Arthritis) and who could read and write English. Therefore, findings of the study might be limited for generalization. Moreover, increasing size of the sample is recommended to enhance more representative of the Bhutanese population. Further study and clinical consultation need to confirm the diagnosis with comparable standardized measures for depression.

An authorship declaration

YT was responsible for proposal development and data collection under supervision of NC. YT wrote the first draft of the manuscript. All authors contributed, edited and approved the final manuscript.

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Disclosure statement

The authors declare no competing interests.

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