Regional update

# Psychological health and menopause-specific quality of life of Malaysian women with type 2 diabetes

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## ARTICLE INFO

## ABSTRACT

Anxiety and depression are more common among females and those experiencing diabetes and menopause. Menopausal symptoms experienced by women can vary tremendously from population to population; therefore, there is a need to investigate these symptoms and associated risk factors in different communities. This study investigated the differences in psychological health and menopause-specific quality of life (MENQOL) between women with and without diabetes type 2 (T2DM) in Malaysia. Women with T2DM ($n = 320$) were matched by age range to controls without T2DM ($n = 320$). Data were collected from March 2012 to January 2013. Delusions Symptoms States Inventory (DSSI) instrument was used to identify symptoms of depression and anxiety. Women with diabetes had higher depressive (11.8% versus 8.4%) and anxiety (8.4% versus 6.6%) symptoms compared to women without diabetes. In both groups, the most common menopausal symptom was aches (muscles and joints). Women without diabetes had significantly higher scores for the sexual domain compared to women with diabetes (4.20 versus 3.21, $p = 0.001$). The odds that a postmenopausal woman with diabetes was depressed or anxious on the DSSI scale increased significantly when the MENQOL score on the physical, vasomotor, and psychosocial domains increased by one unit. Both diabetes and psychological problems have negative impact on MENQOL. Our findings support the view of screening postmenopausal women with diabetes for depressive and anxiety, to improve overall quality of life.

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## 1. Introduction

The world prevalence of diabetes is increasing rapidly; diabetes affected 382 million people worldwide in 2013 and the number is projected to rise to 592 million by 2035 (IDF, 2013). The prevalence is expected to shift to the South East Asia Region by 2025, with an estimated prevalence of 13.5% and affecting 145 million people (IDF, 2013; IDF, 2003). In Malaysia, a middle-income, developing country located in the South East Asia Region, the prevalence of diabetes has doubled over the past decade (Hasan et al., 2013a,b,c; Zanariah et al., 2010). The National Health and Morbidity Survey I (NHMS-I) conducted in 1986, reported a 6.3% prevalence of diabetes among adults aged ≥35 years; however, the prevalence rose to 8.3% in 1996 and 15.2% in 2011 (Institute for Public Health, 2011; Zanariah et al., 2010). WHO estimates a total of 2.48 million people with diabetes in Malaysia by 2030 (Zanariah et al., 2010). In other developing countries such as China, Brazil and Egypt, diabetes is more prevalent among women, regardless of age (Hu et al., 2001; Wild et al., 2004). The prevalence of diabetes worldwide is similar among men and women although it is more prevalent in women after the age of 65 years (Wild et al., 2004).

Diabetes mellitus is one of the chronic, inherited or acquired diseases where patients experience a number of co-morbidities including physical and psychological problems (Hasan et al., 2013a). Depression and anxiety are two common, co-morbid, modifiable psychological conditions associated with diabetes (Hasan et al., 2013b; Smith et al., 2013), and recent meta-analyses

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have found significant and positive associations for diabetes with both depression (Hasan et al., 2013b), and anxiety (Smith et al., 2013) although, Brown et al. (2006) found no association. Co-morbid conditions of diabetes with depression and/or anxiety intensify the burden of diabetes symptoms (Katon, 1982; Konen et al., 1996), increase complications (Kaholokula et al., 2003), increase glycaemic levels (Gary et al., 2000), increase non adherence to medications (Lin et al., 2008), and reduce quality of life (Lloyd et al., 2000). Despite the high prevalence of diabetes in the general population in Malaysia (Institute for Public Health, 2011; Zanariah et al., 2010), only a few cohort or case-control studies are available on this topic. These studies support the hypotheses that people with diabetes are more likely to have depression or anxiety symptoms than people who do not have diabetes (Kaur et al., 2013; Subramaniam et al., 2009). Some authors have also suggested that depression and anxiety symptoms are significantly higher in postmenopausal women compared to premenopausal women (Saqsoz et al., 2001).

Type 2 diabetes mellitus is one of the most common chronic diseases in women after menopause (Monterrosa-Castro et al., 2013). However, whether menopausal status independently influences or increases diabetes risk remains controversial (Kim, 2012; Monterrosa-Castro et al., 2013; Szmuilowicz et al., 2009). There is a higher prevalence of diabetes among women with a history of menstrual irregularity (Roumain et al., 1998), particularly in those with long and highly irregular menstrual cycles (Solomon et al., 2001). The increase in abdominal fat caused by depletion of ovarian function (Meyer et al., 2011), may cause disturbances in insulin sensitivity and glucose metabolism in postmenopausal women (Szmuilowicz et al., 2009). The changes in hormonal levels during the menopausal transition and after menopause can trigger fluctuations in blood glucose levels (Otsuki et al., 2007). The changes in hormonal levels may also result in weight gain (Simkin-Silverman and Wing, 2000), sleep (Australian Menopause Society, 2013), and sexual problems (Dennerstein et al., 2003).

Women can experience a number of menopausal symptoms as part of a normal physiological process that often occurs in women at an average age of 50 years (Burger et al., 2002). These symptoms are often attributable to reduced hormone levels and include vasomotor, psychological, musculoskeletal or physical and urogenital or sexual symptoms (Ogbera et al., 2011). These symptoms can affect the quality of life as measured by Menopause Specific Quality of Life (MENQOL) in postmenopausal women (Williams et al., 2009). Women with diabetes generally appeared to have worse quality of life and mental well-being compared to men with diabetes; explicitly, more diabetes-related worries and less ability to cope (Unden et al., 2008). This suggests that diabetes combined with menopausal symptoms may significantly reduce quality of life.

Anxiety and depression are more common among females and those experiencing diabetes and menopause; hence women are the target population in our study (Collins et al., 2009; Grigsby et al., 2002; Khuwaja and Kadir, 2010). Menopausal symptoms experienced by women can vary tremendously from individual to individual, and population to population (Gold et al., 2000; World Health Organization, 1990, 1996); therefore, there is a need to investigate these symptoms and associated risk factors in different communities. The primary objective of this study was to determine the pattern of menopausal symptomatology in Malaysian women with and without type 2 diabetes. The specific aims of this study include the following: to determine the association between symptoms of depression and anxiety and type 2 diabetes, and MENQOL domains and type 2 diabetes using case-control data; and to compare the symptomatology of menopause in postmenopausal women with and without type 2 diabetes.

## 2. Methods

### 2.1. Study design and population

This study involved women with diabetes matched to women without type 2 diabetes in the same age range. A frequency matching technique was used to match participants on cell instead of individual basis. The frequency matching was conducted using two conditions: presence or absence of diabetes and aged 35 years or more. The frequency matching was completed in two steps. In the first step, only women aged 35 and older who attended outpatient clinics for the management of T2DM and who had a known diagnosis of T2DM were selected (cases). In the second step, cases were matched with controls; these were women aged 35 years and older, with no known diagnosis of T2DM. The control participants were healthy friends or unrelated family members (no blood relation) of women with type 2 diabetes.

Three Medication Therapy Adherence Clinics (MTACs), two hospital-based (Hospital Putrajaya and Hospital Tuanku Jaa'far Seremban) and one Health Clinic (Health Clinic, Seremban) in West Malaysia were selected as primary sampling sites. Non probability-based design was used to select the sampling sites. Recruitment was initially started in Hospital Putrajaya where the majority of the patients were of Malay origin. Therefore, to select a sample that included all three ethnic groups, sampling was extended to the Seremban region to include patients of Chinese and Indian ethnicity. Data were collected from March 2012 to January 2013.

Every second woman with diabetes on the respective patients' lists at the clinic sites was systematically invited to participate; verbal or written consent was obtained from participants who met the inclusion criteria. Out of 415 women with diabetes invited to participate in the study, 320 (77%) accepted and participated. Out of 390 women without diabetes who were invited to participate, 320 (82%) accepted and participated. Face-to-face interviews were conducted at the outpatient clinics, using study questionnaires.

### 2.2. Assessment of type 2 diabetes

Data on type 2 diabetes were collected through a self-administered questionnaire, where women were asked "Have you EVER been told by a doctor that you have diabetes (high blood sugars)?" with response options "yes" or "no." Participants were categorized as having type 2 diabetes if they had been told by a physician they had diabetes. Information was further confirmed by accessing patients' medical records. The presence of type 2 diabetes is identified in the hospital according to two criteria: A fasting plasma glucose (FPG) greater than or equal to 7.0 mmol/l, and random plasma glucose (RPG) greater than or equal to 11.1 mmol/l. Participants were not recruited if data on their blood glucose levels were missing, and women diagnosed with type 1 diabetes were excluded. The 320 women with diabetes were categorized based on the duration of type 2 diabetes: 0–5 years, 6–10 years, and >10 years.

### 2.3. Delusion symptoms states inventory (DSSI)—study instrument

The information about the presence of depression and anxiety symptoms was measured by Delusion Symptoms States Inventory: State of Anxiety and Depression (DSSI/sAD). The DSSI, a 14-item self-administered questionnaire which assesses the mood states of anxiety and depression has been validated against clinical samples with diagnosed mental illness (Bedford and Folds, 1977; Foulds and Bedford, 1975; Morey, 1985). The DSSI correlates well, and shares items with, other established symptoms scales such as the Edinburgh Postnatal Depression Scale (EPDS) and the Hospital Anxiety/Depression Scale (HADS) (Bedford and Deary, 1999;