Review Article

Medication Adherence and Concordance among Diabetes Patient: A Mini Review

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Abstract: Diabetes mellitus places an immense burden on the individuals living with the condition, their families and the overall health care system despite the advances in the treatment of diabetes mellitus over the years. Thus, this review aimed to search the literatures on the adherence and concordance of diabetes patient's tolerance in taking their medication. Five articles were selected for this min review. Finding showed that the factors influence on the non-adherence and concordance towards medication among diabetes patients are high expenses of medication, age factor, belief in traditional medication and dietary modification. It is important for the nurses and other health care providers to remind the patient and always assess their understanding as both sides have come to a shared agreement about therapeutic goals.
Keywords: Diabetes Mellitus, Medication Adherence, Medication Concordance

INTRODUCTION

Nowadays, diabetes is a major public health problem that has already approaching epidemic proportions globally. The National Health and Morbidity Survey (NHMS) 2011, reported that diabetes prevalence figures of 15.2% and 20.8% for adults above the age of 18 and 30 years in Malaysia. Even though diabetes mellitus is recognized as a major chronic illness, the adherence to antidiabetic medicines has often been found to be unsatisfactory among patient with Type 2 Diabetes Mellitus (T2DM).

This review aimed to identify the literatures on the adherence and concordance of diabetes patient's tolerance in taking medication. So, these are the general terms that will be highlighted in this review. The first one is adherence that is defined as the extent to which a person's behaviour in terms of taking medications, following diets, or executing lifestyle changes coincides with medical or health advice (Nur Sufiza Ahmad *et al.,* 2014). Therefore, medication adherence is an important key that determine the therapeutic success and the effectiveness of the treatment in patients with diabetes mellitus. Medication compliance can be defined as taking the correct medicine in the correct dose at the correct time by a patient as prescribed by the physician while non-adherence is defined as the act of not following the recommendations for prescribed treatments indicating patient's ineffectiveness and unable to follow the instruction (Gangwar *et al.,* 2013). Hence, the non-adherence to lifestyle modification among diabetic patients will develop the short-term risks and the long-term complications as well as the declines in quality of life. Non-adherence to medications is a pervasive medical problem that is common among patients with chronic disease generally and particularly in T2DM. Indeed, poor adherence to medication is a huge obstacle in therapeutic control of diabetes.

Another term is concordance which being used to refer the level of relationship between patient and clinician regarding the nature of the illness and the need of treatment or in other words, a consultation process between a health care professional and a patient. Most of the articles aimed to assess patient's adherence to medication and also to identify factors that are associated with the non-adherence to medication among patient with Type 2 diabetes mellitus. Therefore, throughout the searching of all previous literatures, the major factors influence the medication adherence can be identified.

METHOD

The literatures were search through Google Scholar, Science Direct and Pro Quest Health and Medical online Database. Five articles were selected for this mini review. Search strategy with search mode 'find all my search terms' within the full text of the articles including patents while limiting the result for full text and peer reviewed without putting any specific publication. The range of published date that has been included in this review were from 2013 to 2018 and limit to just for English language only. The journal subset being set for all and accepting from both sex of male and female. The searching keywords were type 2 diabetes mellitus, medication adherence, and medication concordance. In addition, Boolean logic (AND) is used to combine the search terms.

FINDINGS

A study was carried out in Alimosho General Hospital of Nigeria, 240 diabetic patients at medical clinic found that half of the studied participants (51.32%) viewed their medications to be unaffordable. There was a significant relationship between patient age, gender and adherence to medication with p value of less than 0.05. In Hulu Langat, Selangor, Malaysia, a cross-sectional survey was done within a 6-month period in seven Ministry of Health Primary Health Clinics. Medication adherence was measured by using the Medication Compliance Questionnaire that consists of a total of seven questions. A total of 557 patients were recruited in their study. Patients who were included in the study were identified through a systematic random sampling of every fifth T2DM patient who attended the clinic based on their scheduled appointments as well as inclusion and exclusion criteria. Approximately 53% of patients in the study population were non-adherent. Variables associated with non-adherence were age, odds ratio 0.967 (95% confidence interval [CI]: 0.948–0.986); medication knowledge, odds ratio 0.965 (95% CI: 0.946–0.984); and comorbidities, odds ratio 1.781 (95% CI: 1.064–2.981).

Another prospective cross-sectional pilot study was conducted for 12 weeks by using Morisky 8-Item Self-Report from type 2 diabetes who are regularly visiting to a particular community ambulatory care pharmacy at Kanpur, Uttar Pradesh. They had recruited 103 patients randomly and found that 91.67% of participants' HBA1C level was in abnormal range.

A study done by Sweilah., *et al.,* (2014), using cross-sectional study to evaluate the association between beliefs about medicines, diabetes-related knowledge, demographic and clinical factors with medication adherence among Palestinians with type 2 diabetes mellitus. This study was carried out at Al-Makhfia governmental diabetes primary healthcare clinic in Nablus, Palestine. The Beliefs about Medicines Questionnaire (BMQ) was used to assess beliefs. The

Morisky Medication Adherence Scale (MMSA-8©) was used to assess medication adherence. The Michigan diabetes knowledge test (MDKT) was used to assess diabetes related knowledge. Approximately 42.7% of the study sample were considered non-adherent (MMAS-8© score of < 6). Multivariate analysis showed that the following variables were significantly associated with non-adherence: disease-related knowledge, beliefs about necessity of anti-diabetic medications, concerns about adverse consequences of anti-diabetic medications and beliefs that medicines in general are essentially harmful. Diabetic patients with high knowledge score and those with strong beliefs in the necessity of their anti-diabetic medications were less likely to be non-adherent ([O.R = 0.87, 95% CI of 0.78 – 0.97] and [O.R = 0.93, 95% of 0.88 – 0.99] respectively). However, diabetic patients with high concerns about adverse consequences of anti-diabetic medications and those with high belief that all medicines are harmful were more likely to be non-adherent ([O.R = 1.09; 95% C.I of 1.04 – 1.16] and [O.R = 1.09, 95% C.I of 1.02 – 1.16] respectively).

An analytical cross-sectional study design was adopted, and 500 type 2 diabetic patients were selected conveniently from an outpatient department (OPD) setting at Bangladesh Institute of Health Sciences (BIHS) hospital. Patients' self-care practices were assessed via interviewer-administered questionnaires. Health related quality of life (HRQoL) was assessed by an adapted and validated Bangla version of the EQ-5D (EuroQol Group, 2009) questionnaire which has five domains- mobility, self-care, usual activities, pain/discomfort and anxiety/depression and two levels on each dimension. The significant association was found between non-adherence to foot care and problem with mobility, self-care and usual activities (p < 0.05). The significant association was also found between non-adherence to exercise and poor mobility, self- care, usual activities, pain and anxiety (p < 0.05). Non-adherence to diet was associated with poor mobility (p < 0.05). In multivariable linear regression non-adherence to foot care (p = 0.0001), exercise (p = 0.0001), and smoking (p = 0.047) showed significant association with EQ-5D index after adjusting co-variates.

Most of the articles included in this mini review using cross-sectional study design, which are quick, easy, and not costly, but the result cannot be taken as representative of the population. Three articles were selected their participants randomly means that all members of a population have an equal and independent chance of being selected while the other two articles are using convenience sampling which may have bias and the sample not represent for diabetic patient population.

DISCUSSION

The major factors that influenced patient type 2 diabetes in each study throughout the five articles will be discussed in this section. The study at Hospital Igando, Lagos, Nigeria about medication adherence in Type 2 diabetic patients, the factors that influenced the non-adherence towards medication are due to high expenses in medication, age, high belief in traditional medication (herbal) and dietary modification. The study that been done in Malaysia at Primary Health Clinic regarding Medication adherence in patient type 2 Diabetic mellitus also found out the causes why the patient did not adherence to medication are due to age, medication knowledge and Type 2 diabetic mellitus with comorbidities.

While in India, a study entitles Medication Concordance among Outpatient with Type 2 Diabetes also found out that missing dose, forgetfulness and expenditure on medicines are the highly observed factor for the medication compliance. Another study from Palestine regarding the influence of patient's disease knowledge and beliefs about medicines on medication adherence also discussing why patient not adherence towards medication which significantly associated with diabetes-related knowledge, beliefs about necessity of the anti-diabetic medications, concerns about adverse consequences of anti-diabetic medications, and beliefs that all medicines are essentially harmful.

Another study about the non-adherence to self-care practices, medication, and health related quality of life among patients with type 2 diabetes from the Out-Patient Department of Bangladesh Institute of Health Sciences Hospital also discussing the association between non-adherence to diet, foot care and exercise with poor mobility, self-care, usual activities, pain/discomfort and anxiety/depression. The use of medication also plays vital part in management of diabetes such as, patients forget to take their medicines, active rejection of therapy, expensive medication, large number of medicines to be taken simultaneously, lack of health improvement, side-effects and absence of signs of illness.

Hence, from this mini review, the most common factors that influence Type 2 diabetes mellitus patient's adherence towards medication are age, patient's knowledge, comorbidities and patient's belief on alternative therapy. As diabetes mellitus is a growing global health problem that can affects patients from all range of ages due to current unhealthy lifestyle. Therefore, age of the patient itself give impact towards patient's adherence in medication specifically for diabetes therapy. The Studies by Nur Sufiza Ahmad *et al.,* (2013) in Malaysia and Awodele, O., & Osuolale, J. (2015) in Nigeria showed patient's age as the variable associated with non-adherence. It can be categorized between young patient and old patient, which got different factor for their act to not compliance to medication. For younger patient, it might be due to their lack of awareness towards the disease. However, in future, younger age will got a very close exposure due to advance technology. While for older patient, memory loss become the major difficulty in following the medication regimen. Therefore, the nurses, doctors, and clinical pharmacist need to play a vital role in educating the patient about the importance of medicine on regular use in blood sugar control.

In term of level of knowledge, studies conducted by Nur Sufiza Ahmad *et al.,* (2013) in Malaysia and Sweilah., *et al.,* (2014) in Palestine have demonstrated poor understanding to be specific regarding medication knowledge among diabetic patients is associated with patient's adherence. Having poor understanding about diabetic medication knowledge putting health care professionals are in the best position to give proper information for better treatment outcome. In giving the information, it is important to know patient's level of knowledge as well as their background in order to plan the way and appropriate words they should use whether they need to simplify the words and definition, or they can use exactly the medical jargon directly. Hence, patient's complete understanding by demonstrating back to them is the main objective to achieve and gain patient's adherence towards medication.

Another factors for non-adherence is the present of comorbidities. Basically, type 2 diabetic patient who with comorbidities will have more other drugs such as anti-hypertensive drugs and lipid lowering agents which come from different pharmacological classes. According to National Diabetes Registry, Volume 1, 2009-2012, the presence of co-morbidities among patients with T2DM in the clinical audit dataset show that hypertension was the most common co-morbidity in 70.1% of audited patients in 2012 followed by dyslipidaemia in 55.1% of audited patients. Due to complex treatment regimen, it contributes toward non-adherence because of multiple medication to be taken. According to Sweilah., et al (2014), has concluded that negative beliefs about the adverse effects of medication is a powerful barrier to success in medication adherence. Therefore, it is important for the diabetic patient to express their concerns so that healthcare teams able to analyse the problem and able to minimize their concerns through proper education.

CONCLUSION

Health education and counselling play major role in medication adherence and concordance in order to improve diabetes patient's quality of life. Therefore, health care teams can improve patient's medication knowledge by giving particular attention to different age groups, medication knowledge, patients with comorbidities as well as their beliefs. After intervention through health education and counselling, the patient's clinical outcome is found to be improved significantly in most of the study. As a nurse, the need is to have strong and effective patient education can be a part of

vital contribution in encouraging patient to adherence in medication. Hence, it is importance for the healthcare workers to assess a patient's knowledge about diabetes mellitus in order to improve the level of medication adherence and consequently therapeutic outcome. To provide more complete picture and findings, a longitudinal study is suggested to be conducted. To summer up here, not compliance to medication can lead to morbidity and mortality in diabetic patients.

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