Medication Adherence Among Diabetic Patients in Developing Countries: Review of Studies

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ABSTRACT

This paper reviewed studies on the adherence to medication among patients with diabetes mellitus (DM) in developing countries. A comprehensive literature search yielded 62 relevant studies. These focused on the extent and predictors of non-adherence to medication across different conditions and factors. Estimated rates of non-adherence to medication ranged from 4% to 88%. This review confirmed the non-adherence to be a problem among patients with chronic diseases and examined our understanding of the reasons and variables affecting patients' adherence to their medication in developing countries. However, the studies employed a wide range of methods, some with limitations. Further work to determine the prevalence and causes of patients' non-adherence to medication in developing countries is needed in order to recommend the best interventions to improve adherence.

INTRODUCTION

Diabetes mellitus (DM) is one of the oldest diseases known to man. It is defined as a metabolic disorder caused by different factors characterised by a chronic high level of blood sugar, with disturbances to carbohydrate, fat and protein metabolism resulting from defects in insulin secretion or action, or both. It is a complex chronic disease requiring continuous medical care with multi-functional risk reduction (Ali, Alemu *et al.*, 2017).

The management of DM consists of lifestyle and dietary changes and pharmacotherapy. For patients with Type 1 DM, insulin remains the mainstay of treatment, while different groups of oral hypoglycaemic agents (OHAs) and insulin are used in treating patients with Type 2 DM. Studies have shown that adequate glycaemic control will slow down or prevent the development of microvascular and macro vascular complications in both types of DM (Olorunfemi and Ojewole, 2019).

Adherence to medications can be influenced by several factors, such as lack of information on the complex regimen, concomitant disease, perception of benefits, side effects, long-duration medication costs and emotional wellbeing (Sapkota, Jo-anne *et al.*, 2015).

Personality and cultural factors may influence adherence compliance rates. Institutional factors such as the availability of medications at hospital pharmacies, prescription patterns and accessibility also affect adherence (Sapkota, Jo-anne *et al.*, 2015).

Methodology

The review identified around 13 articles with high-to-moderate adherence by patients to medications, while others showed different percentages of non-adherence due to several factors, including education, cost, side

A review of the literature was conducted to find research articles that have affected the infect of interventions on adherence to antidiabetic medication in developing countries. The research was conducted on the Pub Med and Google Scholar databases.

Each database was searched using the following terms: medication adherence (concept 1), diabetic (Type 1 and 2) patients (concept 2) developing countries (concept 3), and factors in non-adherence (concept 4).

The research strategy was limited to articles published between 2000 and 2018. The references of all studies included in in this review were hand-searched and met all the inclusion criteria.

Results

- Study selection:
The literature review identified 500 citations, of which 62 met the criteria of the review and only 57 were selected based on the term selected.

- Study characteristics:
The majority of articles reviewed were conducted in Nigeria (9 No.), Ethiopia (8 No.) and Brazil (5 No.) and various other developing countries. The majority of study designs (around 30 articles) were cross-sectional; several others were retrospective and there were other random types of study design.

Several scales were used to measure medication adherence, the most widely used being the Morisky scale (MMSA-8) (13 articles), while others measured adherence percentages using various other scales.

effects, some beliefs about medicines, the numbers of drugs, age, patient income, medication availability, knowledge and quality of life.

COUNTRY	STUDY DESCRIPTION	SAMPLE SIZE	SCALE	PERCENTAGE ADHERENCE	FACTORS
Ethiopia (Ali, Alemu et al., 2017)	Cross-sectional	146	MMSA-8	54%	Satisfaction Medication availability Education
Bangladesh (Saleh, Mumu et al., 2014)	Cross-sectional	500	EQ-5D	80%	Age Gender Education
Tanzania (Rwegerera, 2014)	Cross-sectional	215	Recall of skipped day	60%	High cost Side effects Disappearance of symptoms
Ethiopia (Mossie, Berhe et al., 2017)	Cross-sectional	264	MMSA-8	72%	Anxiety Physical illness Depression
Nigeria (Olorunfemi and Ojewole, 2019)	Not specified	180	MMSA-8	5.6%	Negative beliefs
Malaysia (Aziz, Hatah et al., 2018)	Cross-sectional	97	MEMS	63.8%	Cost
Nigeria (Fadare, Olamoyegun et al., 2015)	Cross-sectional	129	MMSA-8	40.6%	Cost
Brazil (Jannuzzi, Rodrigues et al., 2014)	Cross-sectional qualitative	17	TPB theoretical framework	53%	Behavioural beliefs
Brazil (Obreli-Neto, Guidoni et al., 2011)	RCT	200	Morisky–Green test	49.5%	Pharmaceutical care programme
Ethiopia (Wabe, Angamo et al., 2011)	Cross-sectional	384	Adherence and self-management monitoring tool	49%	Side effects Lack of finance
Ethiopia (Gelaw, Mohammed et al., 2014)	Cross-sectional	270	Self questionnaire	72%	Forgetfulness High cost Feeling better
Tanzania (Kamuhabwa and Charles, 2014)	Cross-sectional	469	MMAS-8	17.5%	Age Sex
Egypt (Shams and Barakat, 2010)	Descriptive	226	MTA	38.9%	Knowledge Beliefs
Nigeria (Ajibola and Timothy, 2018)	Cross-sectional	110	MMAS-8	Low	Cost Income
Jorden (Qteishat and Ghananim, 2016)	Cross-sectional	200	Self-report	59%	Education

Pakistan (Mumtaz, Haider *et al.*, 2016)	Cross-sectional	300	14-SCI	Low	Meal planning Doctor visit
Iran (Ahmadipour, Farajzadegan *et al.*, 2010)	RCT	87	Clinical scoring	96.7%	Forgetfulness
Malaysia (Nasir, Ariffin *et al.*, 2018)	Cross-sectional	197	Single item self-report	62.9%	Education Number of drugs
Malaysia (Appalasamy, Tha *et al.*, 2018)	Cross-sectional	62	PDSMS, MUSE, MMAS-8	Validation study	N/P
Malaysia (Al-Qazaz, Hassali *et al.*, 2011)	Qualitative	12	Open question	Low	Knowledge
Nigeria (Yusuff, Obe *et al.*, 2008)	Cross-sectional	200	ASMMT	41%	S/E Cost
Uganda (Bagonza, Rutebemberwa *et al.*, 2015)	Cross-sectional	521	Self-report	83.3%	Education Dosage form Availability
Palestine (Sweileh, Sa'ed *et al.*, 2014)	Cross-sectional	405	MMSA-8	57.3%	Disease-related knowledge Beliefs Chronic treatment
Nigeria (Fadare, Olamoyegun *et al.* 2015)	Cross-sectional	129	MMSA-8	59.4%	Income Sex Education Age
Ghana (Bruce, Acheampong *et al.*, 2015)	Cross-sectional	200	MMSA-8	385%	Gender Age Education Occupation Mode of payments Income
Nigeria (Awodele and Osuolale, 2015)	Cross-sectional	240	Self-report	86.8%	Age Gender
Egypt (Mahfouz and Awadalla, 2011)	Cross-sectional	206	Adherence questionnaire	41.7%	Age Gender Occupation Education DM duration
Zambia (Musenge, Michelo *et al.*, 2016)	Cross-sectional	198	WHO STEPS	50%	Comorbidity Overall health level Number of drugs Complexity of drug regimen
Brazil (Gusmai, Novato *et al.*, 2015)	Systematic review	6 studies	Questioner	Low	QOL
Ethiopia (Bonger, Shiferaw *et al.*, 2018)	Cross-sectional	419	Self-questionnaire	24.1%	Education

Pakistan (Iqbal, ul Haq *et al.*, 2017)	Cross-sectional	300	DAI-10	55.6%	QOL
Brazil (Gomes-Villas Boas, Foss *et al.*, 2012)	Cross-sectional	162	QAAD	95.7%	Social demographic
Ethiopia (Habte, Kebede *et al.*, 2017)	Qualitative study	39	Open question	Low	Education
Libya (Ashur, Shah *et al.*, 2015)	Cross-sectional	523	MMSA-8	63.9%	Education Sex Medication
Jamaica (Bolarinwa, Ameen *et al.*, 2016)	Prospective cohort	104	Clinical scoring	66%	Gender DM types
Colombia (Alayón and Mosquera-Vásquez, 2008)	Descriptive	131	Self-report	Low	N/P
India (Basu, Garg *et al.* 2018)	Cross-sectional	375	Open ended questions	82.4%	Education Gender
China (Wu and Liu 2016)	Cross-sectional	103	MMSA-8	45.4%	Patient beliefs
Ethiopia (Kassahun, Gesesew *et al.* 2016)	Cross-sectional	325	MMAS-8	37.2%	DM duration BMI
Ethiopia (Abebe, Berhane *et al.* 2015)	Cross-sectional	407	MMSA-8	54.8%	Age Sex DM duration DM types

Discussion

Due to the increasing number of complications resulting from patients not adhering to antidiabetic medications and an increasing rate of mortality, several studies were conducted to identified the percentage of patients adhering and not adhering, describing the factors that were affecting that adherence, and finding solutions for them in order to enhance the diabetic patients' wellbeing. Many countries showed several articles, the majority being from Nigeria, Ethiopia, Brazil, Malaysia and Egypt (Sapkota, Jo-anne *et al.*, 2015).

Only few of the articles we reviewed showed good adherence by patients to their antidiabetic medications using the Morisky scale (Kamuhabwa and Charles, 2014). Other showed non-adherence and others were not specified. Around 12 articles reviewed reported high-to-moderate adherence, ranging from 50% to 83%. Other articles in which patients showed low-to-poor adherence identified many reasons why people could not adhere to their regimens and suffered from complications; these factors included the high cost of antidiabetic drugs and their availability (Ajibola and Timothy, 2018).

Some could not adhere because of poor education and knowledge (Gelaw, Mohammed *et al.*, 2014). Poor quality of life was also reported, in addition to low income and employment (Fadare, Olamoyegun *et al.*, 2015). Gender and age were also mentioned in the literature, showing that young people and females adhered better to regimens (Shams and Barakat, 2010).

Other factors reported were beliefs about the disease, regimen and drugs (Shams and Barakat 2010), and medication availability and satisfaction (Ali, Alemu *et al.*, 2017).

Conclusion

The results we found showed that the majority of developing countries exhibit low adherence to medication among diabetic patients. This is due to several factors, the most common being the cost of medication, quality of life, the availability of medicine and the low income and education of patients. This requires fast resolution to overcome these obstacles in order to enhance patient wellbeing and reduce the overall complications of diabetes.

Recommendations

1 – More studies on medication adherence.
2 – Long-duration studies to evaluate factors.
3 – More effective interaction between patients and doctors in order to increase patient adherence to diabetic medication.
4 – Further research to identify why interaction between patients and doctors is low.

5 – Further explanations of the disease and its complications and of antidiabetic drugs.
6 – More research in developing countries.

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