Self-care practice and its predictors among adult diabetic patients on follow-up at public health care diabetic referral clinics, Debre Markos, Ethiopia

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ABSTRACT

Diabetes Mellitus is a known metabolic disorder and an emerging public health problem in developing countries. The study aimed to assess patients’ self-care practice and its predictors among adult diabetic patients on follow-up at public health care diabetic referral clinics in Debre Markos Town.

A cross-sectional study was conducted from November to January 2021/2022, on diabetic patients who were on follow-up. After ethical clearance was obtained from the ethical review board of Debre Markos University, data were collected and checked for its completeness, then coded, and entered using EPI data version 4.4.2, and analyzed using SPSS version 22. Finally descriptive statistics were presented using tables, graphs, and texts. In addition all independent variables with \( P \leq 0.2 \) in the bi-variable logistic regression analysis were analyzed by multivariable logistic regression with 95 % CI at 5 % margin of error and a \( p \)-value < 0.05 was declared as statistical significance.

Out of the total 239 respondents 48.5 % of the study participants had good diabetes self-care practices. Diabetic patients who had college and above level of education were 1.41 times (AOR: 1.41, 95 % CI 0.54–3.65) more likely to have good self-care practice than those who were under diploma level of education. The odds of good diabetic self-care practice were 1.36 times (AOR: 1.36, 95 % CI 1.41–3.43) higher among respondents who were governmentally employed than those who are not employed. Study participants who were rural residents were 29 % (AOR: 0.71, 95 % CI 0.40–2.23) less likely to practice self-care habits than those urban residents of DM. Participants who were on the follow-up for less than one year were 47 % (AOR: 0.57, 95 % CI 0.12–2.46) less likely to have self-care practice than those patients who had been on follow-up for more than ten years.

In this study the overall level of self-care practice among diabetic patients was low as compared to the previous study findings, so diabetic patients require intervention with an integrated approach through treatment as well as health education which will increase the health and well-being of the patients.

In the present study employment, level of education, residency, and length of diabetic treatment were strongly associated with self-care practice of diabetes mellitus.

1. Introduction

Diabetes mellitus (DM) is a metabolic disorder, non-communicable disease (Asmelash et al., 2019; Guariguata et al., 2011), and the most challenging public health problem of the twenty-first century (Guariguata et al., 2011; Shaw et al., 2010) which results in significant disability and premature death (Alaofe et al., 2021; Asdaq, 2018).

Currently, DM affects >366 million people in the world (Guariguata et al., 2011), 15.9 million people in Sub-Saharan Africa (Brussels, 2013), and Ethiopia is not free from the burden since accounts 1.9–6.5 % in the general population (Abebe et al., 2014; Alqurashi et al., 2011; Aynalem et al., 2016). Diabetes mellitus costs 3.3 billion dollars worldwide in the health care system (Guariguata et al., 2011). Even though diabetes-related complications can be prevented with

Abbreviations: CI, Confidence Interval; DM, Diabetes Mellitus; SPSS, Statistical Product and Service Solution.
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early detection, and aggressive glycemic control, most type2 DM patients have long asymptomatic periods and patients come up with complications at the time of diagnosis (Powers et al., 2015; Belsti et al., 2020; Nathan et al., 2009). Although self-care practice requires identification of type of DM, several studies show that most patients who are on diabetic follow-up have no idea what type of DM they have (Asmelash et al., 2019; Guariguata et al., 2011). Glycemic control is one of the challenges among diabetic patients due to limited self-care practice which greatly affected standard care in developing countries (Tanjia et al., 2016; Amente et al., 2014). Despite the patient living with the disease for >10 years only some of them knew the pathophysiology and some of them still believed that diabetes is among curable diseases (Kassahun and Mekonen, 2017).

In addition to good healthcare professional involvement and national policy, the self-care practice of DM patients plays a crucial role in obtaining a good healthy life (Nathan et al., 2009; Kassa et al., 2021), in managing macro- and micro-vascular complications (Nathan et al., 2009). Lifestyle modification, including regular exercise, healthy diet, and weight loss has paramount importance in the prevention and management of diabetes mellitus (Alaof et al., 2021; Pourkazemi et al., 2020), and this study shows the gap in self-care practice and associated factors among diabetic patients on follow-up.

2. Objectives

2.1. General objective

To assess self-care practice and its predictors among adult diabetic patients on follow-up at public health care diabetic referral clinics, Debre Marksos Town, Debre Marksos, Ethiopia, 2021/2022. Cross-Sectional Study.

2.2. Specific objectives

To determine the level of self-care practice among diabetic patients.
To identify predicting factors on self-care practice of diabetic patients.

3. Methods

A cross-sectional study was conducted at public health care diabetic Referral clinics in Debre Marksos Town from November to January 2021/2022 on diabetic patients who were on follow-up. Debre Marksos town has four governmental health care diabetic Referral clinics. Diabetic patients who were present at those diabetic clinics during the study period were included in this study except for those individuals who refused to participate and the individuals who were health professionals.

After Ethical clearance was obtained from Debre Marksos University ethical review board, the study was conducted following the Helsinki declaration. Written informed consent was obtained from each patient and data were collected with a pre-tested questionnaire. Later data were checked for its completeness, then coded, and entered using EPI data version 4.4.2, and analyzed using SPSS version 22. Descriptive statistics and a p-value estimated to identify the factors associated with the outcome variable and all variables with P<0.2 in the bi-variable logistic regression were included in the multivariable logistic regression analysis.

Multi-collinearity was checked to see the linear correlation among the independent variables by using the standard error. Variables with a standard error of >2 were dropped from the multivariable logistic regression analysis.

The association between the outcome variable and independent variables was assessed with bi-variable and multivariable logistic regression and all variables with P≤0.2 in the bi-variable logistic regression were included in the multivariable logistic regression analysis.

Finally adjusted odds ratio with 95% CI at a 5% margin of error was estimated to identify the factors associated with the outcome variable and a p-value <0.05 was declared statistical significant.

This study is registered with researchregistry7866 and reported in line with STROCSS 2021 (Mathew et al., 2021).

3.1. Operational definition

Self-care practice-related questioners have 10 inquiries with “Yes”, or “No” responses. A score of “1” was given for “Yes”, and “0” for “No”. Then, a score greater or equal to the mean response was considered good self-care practice, while the remaining was perceived as a poor level of practice.

4. Results

4.1. Socio-demographic characteristics

In this study, 239 participants with a response rate of 100% were included. Of all respondents, 120 (50.4%) were female and 124 (52.1%) were urban inhabitants. Most of the respondents (108 (45.4%)) were aged 31–50 years. The majority of (192 (80%)) of the study subjects were Orthodox Christians. Out of the total respondents, 160 (66.7%) were married, 75 (31.3%) were haven’t formal education, and 69 (28.7%) had a monthly income below 1000 Ethiopian birr (Table 1).

4.2. Health profile of study subjects

In this study, most patients on follow-up were diagnosed within a year 71 (29.6%). Among the diabetic patients, 133 (56.2%) of them do not know what type of DM they have and 59 (24.6%) of the study subjects have additional comorbidities. On the other hand majority of patients were on a treatment modality of oral hypoglycemic agents 132 (55.3%) followed by subcutaneous injectable medications of insulin 96 (40.17%) as shown in (Table 2).

4.3. Self-care practice of study subjects regarding diabetes mellitus

Among diabetic patients, blood pressure checkups were around 62.1%

| Variable            | Frequency | Percentage (%) |
|---------------------|-----------|----------------|
| Age                 | <18       | 21             | 8.8              |
|                     | 18-30     | 87             | 36.3             |
|                     | 31-50     | 108            | 45.4             |
|                     | >50       | 23             | 9.6              |
| Sex                 | Male      | 119            | 49.6             |
|                     | Female    | 120            | 50.4             |
| Religion            | Orthodox  | 192            | 80               |
|                     | Protestant| 39             | 16.3             |
|                     | Muslim    | 8              | 3.7              |
| Marital status      | Married   | 160            | 66.7             |
|                     | Single    | 62             | 25.8             |
|                     | Divorced  | 10             | 4.2              |
|                     | Widowed   | 7              | 3.3              |
| Residence           | Rural     | 115            | 47.9             |
|                     | Urban     | 124            | 52.1             |
| Educational status  | No formal education | 75 | 31.3 |
|                     | Primary education | 46 | 19.2 |
|                     | Secondary school | 40 | 16.7 |
|                     | Collage and above | 78 | 32.8 |
| Occupational status | No occupation | 39 | 16.3 |
|                     | Farmer    | 37             | 15.4             |
|                     | Merchant  | 52             | 21.7             |
|                     | Government employed | 111 | 46.6 |
| Monthly income      | <1000     | 69             | 28.7             |
|                     | 1000-2999 | 58             | 24.2             |
|                     | 3000-5999 | 53             | 22.5             |
|                     | 6000-9000 | 50             | 20.8             |
|                     | >9000     | 9              | 3.8              |
weight reduction. On the other hand only 17.1 % of participants had an
Ethiopia 2021/22( %) were trying to manage their diet and only 32.9 % of them were trying
were 54.6 %, and 72.1 % respectively. Majority of respondents 221(92.5 - - - - - - - - - -
Table 3 ).

Table 2
Health profile of study subjects, to determine self-care practice, and its predictive factors among diabetic patients at public health care, diabetic referral clinics, Debre Markos Town, Debre Markos, Ethiopia 2021/2022(N = 239).

| Variables                                      | Frequency | Percentage |
|------------------------------------------------|-----------|------------|
| Length of diabetes mellitus therapy?           |           |            |
| < 1 year                                       | 71        | 29.6       |
| 1-5 year                                       | 67        | 27.9       |
| 5-10 years                                     | 40        | 16.7       |
| > 10 years                                     | 61        | 25.8       |
| Do you have any other medically proven comorbidity? |           |            |
| No                                             | 180       | 74.4       |
| Yes                                            | 48        | 20         |
| Do you have a family history of diabetes mellitus? |           |            |
| No                                             | 124       | 51.7       |
| Don’t know                                     | 67        | 28.3       |
| Do you know your diagnosis of the type of diabetes mellitus? |           |            |
| Type1                                          | 40        | 16.3       |
| Type2                                          | 66        | 27.4       |
| Don’t know                                     | 133       | 56.3       |
| What medication do you use as a treatment for diabetes mellitus? |           |            |
| Injectable                                      | 96        | 40.1       |
| Tablet                                         | 132       | 55.3       |
| Mixed                                          | 11        | 4.6        |

%, while urine examinations and blood glucose check-ups every month were 54.6 %, and 72.1 % respectively. Majority of respondents 221(92.5 %) were trying to manage their diet and only 32.9 % of them were trying weight reduction. On the other hand only 17.1 % of participants had an eye examination within a year as shown in (Table 3). Among insulin users, 83.7 % control the cold chain of the drug by using either refrigerator or locally available cold sandy soil in the pit (Table 3).

Generally, 48.5 % (95 %, CI = 43.6–59.2 %) of respondents had good self-care practice regarding self-care prevention and management of diabetes mellitus with a practice mean score of 5.8 ± 1.65 as shown in (Fig. 1).

4.4. Factors affecting self-care practice on diabetes mellitus

Diabetic patients who had college and above level of education were

Table 3
Self-care practice on diabetic complications among diabetic patients at public health care diabetic referral clinics, Debre Markos Town, Debre Markos, Ethiopia 2021/22(N = 239).

| Variable                                      | Frequency | Percentage (%) |
|-----------------------------------------------|-----------|----------------|
| Do you check your blood pressure every month? | Yes       | 62.1           |
|                                               | No        | 37.9           |
| Would you check urine analysis every month?   | Yes       | 54.6           |
|                                               | No        | 45.4           |
| Would you check your blood glucose every month? | Yes     | 72.1           |
|                                               | No        | 27.9           |
| Would you check your eye every year in the nearby hospital? | Yes | 17.1 |
|                                               | No        | 82.9           |
| Would you modify dietary after the diagnosis? | Yes       | 92.5           |
|                                               | No        | 7.5            |
| Have you tried weight reduction or gain after the diagnosis? | Yes  | 32.9 |
|                                               | No        | 67.1           |
| If you are on insulin user did you store drugs in a Refrigerator or Pit with sand soil? | Yes  | 83.7 |
|                                               | No        | 16.3           |
| Have you performed deliberate physical exercise? | Yes  | 47.3 |
|                                               | No        | 56.7           |

1.41 times (AOR: 1.41, 95 % CI 0.54, 3.65) more likely to have good self-care practice than those who were under diploma level of education. The odds of good diabetic self-care practice were 1.36 times (AOR: 1.36, 95 % CI 1.41, 3.43) higher among respondents who were governmentally employed than those who are not employed. Study participants who were rural residents were 29 % (AOR: 0.71, 95 % CI 0.40, 2.23) less likely to practice self-care habits than those urban residents of DM. Respondents who were on the follow-up for less than one year were 47 % (AOR: 0.57, 95 % CI 0.12, 2.46) less likely to have self-care practice than those patients who had been on follow-up for more than ten years (Table 4).

5. Discussion

Diabetes mellitus (DM) has become a global epidemic with significant disability and premature death, so the present study discloses important information on the level of self-care practice and its predictors among diabetic patients at public health care DM referral clinics on follow-up. Preventing diabetes-related morbidity and mortality requires dedicated self-care practice in the form of multiple domains, including diet selection, routine physical activity, appropriate medications, and blood glucose monitoring from the patients. Although multiple demographic and socio-economic factors can be considered as contributors self-care practice in diabetic patients, the role of clinicians in promoting self-care is vital and has to be emphasized (Shrivastava et al., 2013).

In this study, 48.5 % (95 %, CI = 43.6,59.2 %) of participants have good self-care practice, and the finding is supported by various studies (Alaofe et al., 2021; Belsti et al., 2020; Kassahun and Mekonen, 2017; Feleke et al., 2013; Rachmi et al., 2016), but this study finding was lower as compared to some studies (Asmelash et al., 2019; Belsti et al., 2020; Baral and Baral, 2021; Diriba et al., 2020). The possible explanation for this difference might be due to socio-demographic deference, literacy status; study subjects only addressed DM patients on follow-up, lack of organized diabetic education practice, and poor participation of media regarding awareness creation on the issue in the study area.

In the present study, Diabetic patients having an educational status of College and above has 1.4times more in self-care practice regarding diabetic prevention and management (AOR = 1.41, 95 % CI: 0.54–3.65) while patients from the rural area have 29 % less in self-care than urban diabetic patients (AOR = 0.71, 95 % CI: 0.40–2.230), which is supported with the several studies (Belsti et al., 2020; Amente et al., 2014; Dedefo et al., 2019). The likelyhood of having good self-care practice in diabetics patients who were on treatment for less than one year was 43 % less as compared to individuals who had been on treatment for >10 years (AOR = 0.57, 95 % CI: 0.12, 2.46) (Table 4). This finding was consistent with various studies (Kassahun and Mekonen, 2017; Asmamaw et al., 2015; Upadhyay et al., 2008). This could be explained by longer treatment having a higher chance of exposure to different reading materials like a leaflet, or manual and they have less communication barrier.

Even though gender is reported as a risk factor in various studies it contradicts with the current study finding. The possible explanation might be most of the present study participants were urban who has a good opportunity to follow television programs to know their disease and a better level of education, as supported by different literature (Kassahun and Mekonen, 2017; Feleke et al., 2013; Asmamaw et al., 2015; Adem et al., 2014).

Based on the study finding we recommend that organized diabetic education should be considered and follow-up should be as per standard. The available diabetic association needs to be strengthened with pieces of equipment and health professionals’ support. Local and national media should have to work accordingly by involving governmental and non-governmental organizations and research in different settings should be conducted by considering larger sample sizes with complementary qualitative methods.
6. Conclusion and recommendation

In this study the overall level of self-care practice among diabetic patients was low as compared to the previous study findings, so diabetic patients require intervention with an integrated approach through treatment as well as health education which will increase the health and well-being of the patients.

In the present study employment, level of education, residency, and length of diabetic treatment were strongly associated with self-care practice of diabetic patients.

7. Declarations

Ethics approval and consent to participate: Ethical approval was granted by Debre Markos University Ethical Review Board, and the study was conducted following the Helsinki declaration. Written informed consent was obtained from each study subject before data collection.

Consent for publication: Consent for publication was obtained from the study participants to publish their identifiable data in an online open-access journal.

Availability of data: data is available on the corresponding author and can be presented upon request.

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CRediT authorship contribution statement

Samuel Debas Bayable: Conceptualization, Methodology, Software, Data curation, Writing – original draft, Writing – review & editing. Abebay Misanaw: Software, Validation, Visualization. Yitayal Guadie Ashebir: Investigation, Supervision.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability

Data will be made available on request.
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