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RESEARCH ARTICLE

DIABETES HEALTH BELIEF OF TYPE 2 ADULT DIABETIC PATIENTS ATTENDING CHRONIC FOLLOW UP UNITS OF DESSIE REFERRAL HOSPITAL, NORTHEAST ETHIOPIA

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ABSTRACT

Background: Diabetes health belief scale was developed to measure attitudes about diabetes self care which could help to explain compliance with prescribed medical regimens. The degree to which patients follow advice as self-care behaviours is determined by health belief of diabetes.

Objective: To assess diabetes health beliefs of type 2 adult diabetic patients attending chronic follow up units of Dessie referral hospital.

Method: Cross-sectional study design was conducted from May 1 to 30, 2018 in Dessie referral hospital diabetic chronic follow up units. Systematic random sampling was a method to select a total of 278 type 2 diabetic patients by using patient registration book as a sampling frame. Data was collected by interview. Epidata 3.1 and SPSS version 23 software were applied for data entry and analysis respectively. Tables and graphs were used to present descriptive analysis. A bivariate logistic regression analysis was done to see the crude association between independent and outcome variables. After that multiple logistic regression model was done by selecting only variables with P-value <0.2 in bivariate analysis. Significant statically association were considered based on adjusted odd ratio included in 95% confidence interval at P-value less than 0.05.

Results: Among respondents 43.5% had low aggregate diabetes health belief and the rest 56.5% had high diabetes health belief. From those variables which were entered to multivariate analysis model marital status, attended a diabetic education, perceived susceptibility, perceived severity, perceived benefit and perceived barrier were found to be significantly statistical associated with aggregate diabetes health belief.

Conclusion and recommendations: Diabetes health beliefs of patients were not adequate so that there is a need to improve diabetes health beliefs of patients. Attention should be given towards diabetes health belief by Dessie referral hospital administrators, health care professionals, diabetic associations and researchers.

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INTRODUCTION

Majority of diabetic patients had poor adherence to self care practices (Berhe et al., 2012; Feleke et al., 2013; Saadia et al., 2010; Chali et al., 2018; Abate et al., 2018). Patients' awareness about diabetes was also low (Naheed, 2010; Upadhyay et al., 2008; El-Khawaga et al., 2015). Hispanic adults believed that diabetes is a serious illness and they could identify many of the symptoms of diabetes but negative attitudes toward insulin were common. They have a fairly cohesive explanatory model of diabetes.

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Health care workers can use information as a starting point to discuss each individual patient's explanatory model of illness, clarify misconceptions and develop an individualized plan of care for type 2 diabetes patients (Hatcher et al., 2007). Type 2 diabetes long-term consequences lead to human suffering and economic costs; however, much of the morbidity associated with long-term micro vascular and neuropathic complications can be substantially minimized by interventions that achieve glucose levels close to normal range (Nathan, 2009). Studies have tried to categorize and measure the beliefs about illness that influence patients' adherence to treatment recommendations in diabetes. The degree to which patients follow advice as various self-care behaviours is determined by their health beliefs of diabetes (Harvey et al., 2009).

According to the HBM, people with diabetes will adhere to treatment plans if they are concerned about their health and believe that, they are susceptible to problems, diabetes could have serious consequences and following medical recommendations will reduce threats, and benefits outweigh the costs of not adhering (Chapman *et al.*, 1995). The theoretical framework illustrates the complex relationship between motivation, health behavior and health outcome. Study result shows the presence of strong link between perceived barriers to health behaviours' and self-management of the diabetic disease process. There were direct relationship within the health belief model of benefits and barriers to adherence to the desired health behavior of regular aerobic exercise (Koch, 2002). A Case control study done in Iran among 120 Type 2 diabetic patients in 2014 to assess effectiveness of self-management promotion educational program among diabetic patients showed that, significant improvements in average response for susceptibility, severity, benefit and self-management among intervention group. Additionally, after intervention, average response of the barrier to self-management was decreased among intervention group (Jalilian *et al.*, 2014). In 2014 study was conducted in Nigeria indicated that, perceived severity and perceived benefits had significant positive relationship with diabetes management (Adejoh, 2014).

A cross sectional study done in Harari, Eastern Ethiopia on 222 respondents indicated large proportion of the respondents had moderate perceived susceptibility 174 (78.4%) and severity 112 (50.5%). More than two third of the respondents 149 (67.1%) had less perceived barrier to self-care practice. Diabetic patients with high perceived severity of the disease were more likely to have good self care practice so that perceived severity of the disease is helpful for the likely hood adherence of self care. High perceived barriers was also one of the obstacles for patients with diabetes self care adherence practice. To increase the self care behavior, diabetes education should focus on severity of diabetes disease and how to overcome barriers for self care practice (Ayele *et al.*, 2012). In Ethiopia, there is limited information about diabetes health belief of type two diabetes mellitus patients. That is why this study was tried to assess the diabetes health beliefs of type two diabetes patients on chronic follow up units of Dessie referral hospital, Northeast Ethiopia.

METHODS AND MATERIALS

Study design, area and period: Institution based, cross sectional study design was done in Dessie referral hospital, from May 1 - 30, 2018. Dessie referral hospital found in Dessie town, Amhara regional state, Northeast Ethiopia, 401km away from Addis Ababa, the capital of Ethiopia and 480 km from Bahirdar, capital of Amhara regional state. This hospital gives many services for patients coming from all woredas and zones of Eastern Amhara and Afar regional state.

Study subjects: Patients who diagnosed with type two adult diabetes and made follow up for at least three months in Dessie referral hospital chronic follow up units were included but critical ill and hearing impairment patients were excluded from the study.

Sample size determination: The sample size calculated by assuming one of the variables of diabetic health beliefs which is proportion of self-care practice to be 56% in previous study

in Tikur Anbessa specialized referral hospital with 5% marginal error, 95% confidence interval (Berhe *et al.*, 2012). Based on this assumption, the sample size for the study was 379. Since the study population is less than 10,000 we used population correction formula, we get 253. Then by adding 10% for non response rate the final sample size was 278 type 2 adult diabetic patients.

Sampling technique and procedure: A systematic random sampling technique was used to select patients where K calculated by total population (N) divided by total sample size (n). Using the K value the participants selected by using patient registration book as a sampling frame and the first study subjects was selected by lottery method.

Data collection tools and procedure: Data was collected by using an interviewer administered questionnaire. The diabetic health belief was assessed by adapting 16 items questionnaire, as developed by given on perceived susceptibility, perceived severity, perceived benefits, and perceived barriers to measure the beliefs of diabetic patients about their diabetes which had proven to be reliable in similar study in Nigeria (Adejoh, 2014; Given *et al.*, 1983). The English version questionnaire translated in to Amharic by individuals who have good ability of the two languages then translated back to English by different person to ensure consistency. Training was given for data collectors and supervisor. Prior to the actual data collection, the questionnaire was pre-tested by 10% of the sample size on type 2 diabetic patients in Borumeda hospital. Findings of the pre-test incorporated to clarify the tool before the actual data collection.

Operational definitions

- High and low perceived susceptibility to diabetes complications: those type 2 DM patients who scores \geq and $<$ the mean of perceived susceptibility questionnaire based on Likert scale respectively.
- High and low perceive severity of diabetes and its complications: those type 2 DM patients who scores \geq and $<$ the mean of perceived severity questionnaire based on Likert scale respectively.
- High and low perceived benefit to self-care practice: those type 2 DM patients who scores \geq and $<$ the mean of perceived benefit questionnaire based on Likert scale respectively.
- High and low barrier to self-care practice: those type 2 DM patients who scores \geq and $<$ the mean of perceived barrier questionnaire based on Likert scale respectively.
- High and low aggregate diabetes health belief: those type 2 DM patients who scores \geq and $<$ the overall mean of perceived susceptibility, severity, benefit and barrier questionnaire based on Likert scale respectively.

Statistical analysis

Data was entered in to epidata and export to SPSS Version 23 for analysis. Descriptive statistics was used to determine mean and frequency of dependent and independent variables. Binary logistic regression was done to see the crude significant relation of each independent variables and dependent variable. Independent variables found p-value less than 0.2 in bivariate analysis fitted to multivariate logistic regressions analysis to control the effect of confounding.

Finally significant factors were identified based on AOR with 95% confidence level at P-value less than 0.05.

Ethical consideration: Ethical clearance was obtained from Wollo University, college of medicine and health sciences research review committee. Official letter was written to Dessie referral hospital. Written consent was obtained from all study participants after information is provided about the purpose of the study, non-invasiveness of the data collection procedure and confidentiality of the information. Respondents allowed to refuse or discontinue participation at any time they want if that is their choice.

RESULTS

Diabetes health belief: Diabetic health belief was assessed by using 16 questions with four questions each assessing the perceived susceptibility to diabetes complications, perceived severity, perceived benefit and barrier to self-care practice. The response rate was 269(96.76%) of the total 278 participants. Among those respondents 117(43.5%) had low aggregate diabetes health belief and 152(56.5%) of them had high diabetes health belief. The overall mean (\pm SD) score of aggregate diabetes health belief was 57.64(\pm 7.680) and the minimum and maximum score were 22 and 73 respectively with a maximum possible score of 80 and minimum of 16.

About 121(45%) of participants reported low perceived susceptibility diabetes complications. Among the total number of respondents to perceived severity and its related complications 120(44.6%) had low perceived severity. Perceived benefit and barrier to self-care practice 84(31.2%) and 137(50.9%) were low respectively (See figure 1)

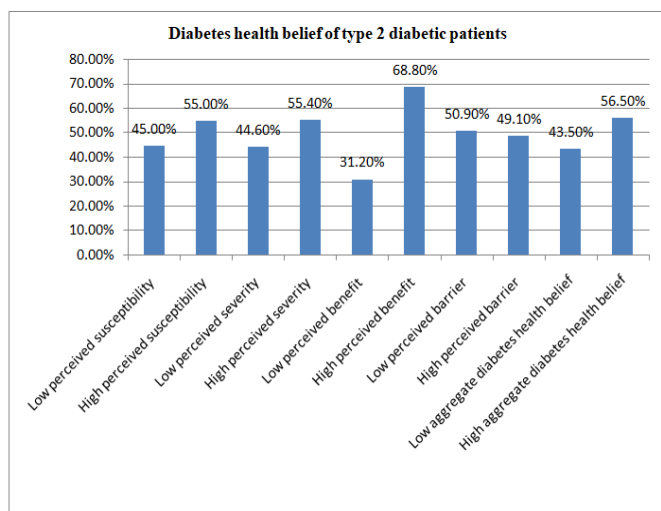


Figure 1. Diabetes health belief of type 2 diabetic patients attending chronic follow-up units of Dessie referral hospital, Northeast Ethiopia

Factors associated with aggregate diabetes health belief of the participants: Variables with p-value less than 0.2 in bivariate logistic analysis were entered to multivariate analysis. Among those variables which were entered to multivariate analysis marital status, attended a diabetic education, perceived susceptibility, perceived severity, perceived benefit and perceived barrier were found to be associated with aggregate diabetes health belief of the participants. Aggregate diabetes

health belief of the participants were better among respondents who had widowed (AOR=3.887, 95%ci=1.004-15.043, p=0.049) as compared to those who were married. Respondents who attend diabetic education sometimes were less likely had high aggregate diabetes health belief (AOR= 0.382, 95% CI=0.175-0.834, P=0.016) as compared to those who were never follow diabetic education.

Participants who had high perceived susceptibility, perceived severity, perceived benefit and perceived barrier were more likely had high aggregate diabetes health belief ((AOR= 13.052, 95%CI=5.438-31.328, P=0.000), (AOR= 17.505, 95%CI=7.718-39.700, P=0.000), (AOR= 8.029, 95%CI=3.125-20.626, P=0.000) and (AOR= 15.024, 95%CI=5.808-38.862, P=0.000)) as compared to those who had low each component of health beliefs (See table 2)

DISCUSSION

The study examined diabetic health belief and its associated factors. The Aggregate diabetes health belief in this study was 43.5% low and 56.5% high. This in line with a study conducted in Nigeria which reported that 43.4% low and 56.6% high aggregate diabetes health belief (Adejoh, 2014). The possible explanation might be presence of similarities between the two study subjects. In the current study among respondents who had high perceived susceptibility to diabetes complications, high perceived severity, high perceived benefit and high barrier to self-care practice were 55%, 55.4%, 68.8% and 49.1% respectively.

A study done in Nigeria on diabetes knowledge, health belief and diabetes management showed that high perceived susceptibility to diabetes complications 47.4%, high perceived severity 46.1%, high perceived benefit 43.4% and high barrier to self-care 53.9% (Adejoh, 2014). There was difference between the two studies especially with regard to perceived benefit. This difference might be due to in our study setting health professionals may devote less time to discuss about diabetes perceived benefit of self care as compared to Nigeria study. A study done in Harari on self care behavior among patients with diabetes: the health belief model perspective revealed that perceived susceptibility to diabetes complications moderate 78.4% and high 17.6%, perceived severity of diabetes and its complications moderate 50.5% and high 40.1%, perceived benefits of self care moderate 44.2% and high 55.9% and perceived barriers to self care moderate 32.9% and high 0.0% (Ayele *et al.*, 2012). The difference between current and Harari study might be due to the presence of category variation that means in present study we have two (low and high) but in Harari three categories by saying less, moderate and high for each component of diabetes health belief.

The findings of the current study revealed that marital status, attended a diabetic education, perceived susceptibility, perceived severity, perceived benefit and perceived barrier were found to be significantly statistical associated with aggregate diabetes health belief of the participants in multivariate logistic regression model analysis. The possible reason might be increased exposure of peoples for attending diabetic educations would have better diabetic health belief. All component of diabetic health belief associated with overall diabetes health beliefs.

Table 1. Factors associated with aggregate diabetes health belief of type 2 diabetic patients attending chronic follow-up units of Dessie referral hospital, Northeast Ethiopia

Variables	Response	Aggregate diabetes health belief		COR(95% C.I)	AOR(95% C.I)	P-value
		Low	High			
		N (%)	N (%)			
Age	<40	28(58.3%)	20(41.7%)	1		
	40-49	31(41.9%)	43(58.1%)	1.942(0.930-4.056)	1.935(0.525-7.132)	0.321
	50-59	24(44.4%)	30(55.6%)	1.750(0.798-3.840)	2.178(0.579-8.195)	0.250
	60-69	22(37.9%)	36(62.1%)	2.291(1.049-5.005)	2.549(0.632-10.280)	0.188
	≥70	12(34.3%)	23(65.7%)	2.683(1.087-6.623)	2.202(0.412-11.768)	0.356
Marital status	Married	91(45.0%)	111(55.0%)	1		
	Single	9(47.4%)	10(52.6%)	0.911(0.355-2.337)	1.847(0.212-16.113)	0.579
	Widowed	10(32.3%)	21(67.7%)	1.722(0.772-3.841)	3.887(1.004-15.043)	0.049*
	Divorced	7(41.2%)	10(58.8%)	1.171(0.429-3.199)	2.206(0.331-14.685)	0.413
Educational level	No formal education	30(41.1%)	43(58.9%)	1		
	Can read and write	37(52.9%)	33(47.1%)	0.622(.321-1.206)	0.596(.200-1.774)	0.352
	Primary school	17(41.5%)	24(58.5%)	0.985(.453-2.142)	0.982(.260-3.709)	0.979
	Secondary school	5(22.7%)	17(77.3%)	2.372(.789-7.131)	1.900(.394-9.175)	0.424
	College/ university	7(33.3%)	14(66.7%)	1.395(.503-3.870)	4.283(.696-26.360)	0.117
	College/ university graduate	21(50.0%)	21(50.0%)	0.698(.325-1.497)	1.969(.598-6.489)	0.265
Current treatment	Insulin injection	31(45.6%)	37(54.4%)	1		
	Oral medication	67(42.4%)	91(57.6%)	1.138(0.642-2.016)	0.833(0.342-2.030)	0.688
	Both insulin injection and oral medication	9(31.0%)	20(69.0%)	1.862(0.742-4.673)	1.979(0.479-8.187)	0.346
	I don't take medication	10(71.4%)	4(28.6%)	0.335(0.096-1.174)	.223(0.033-1.490)	0.122
Attended a diabetic education	No, never	43(35.8%)	77(64.2%)	1		
	Yes, sometimes	57(50.4%)	56(49.6%)	0.549(0.325-0.927)	0.382(0.175-0.834)	0.016*
	Yes, regularly	17(47.2%)	19(52.8%)	0.624(0.294-1.326)	1.041(0.306-3.537)	0.949
Current fast blood sugure	Yes	11(32.4%)	23(67.6%)	1		
	No	106(45.1%)	129(54.9%)	0.582(.271-1.248)	0.469(0.134-1.641)	0.236
Perceived Susceptibility	Low	81(66.9%)	40(33.1%)	1		
	High	36(24.3%)	112(75.7%)	6.300(3.696-10.739)	13.052(5.438-31.328)	0.000*
Perceived Severity	Low	86(71.7%)	34(28.3%)	1		
	High	31(20.8%)	118(79.2%)	9.628(5.497-16.864)	17.505(7.718-39.700)	0.000*
Perceived Benefit	Low	58(69.0%)	26(31.0%)	1		
	High	59(31.9%)	126(68.1%)	4.764(2.731-8.310)	8.029(3.125-20.626)	0.000*
Perceived Barrier	Low	79(57.7%)	58(42.3%)	1		
	High	38(28.8%)	94(71.2%)	3.369(2.030-5.593)	15.024(5.808-38.862)	0.000*

Statistically significant at p-value <0.05

This indicates that each component had great contribution for overall aggregate value of diabetes health belief as each component is part of the whole value.

Limitations of the study

- Limitation of related literatures especially in our country to compare and discuss the findings.
- Since the study design were cross-sectional method the direction of causal relationship between variables can't always be determined.
- The findings in this study were based on quantitative method only that lacked triangulation with other methods like focus group discussion and in-depth interview.

Conclusion and Recommendation

This study showed that diabetic health belief of type 2 diabetes patients was not adequate. Therefore attention should be given for diabetic health belief by Dessie referral hospital, health care professionals and diabetic associations. Researchers should also do further study by using both qualitative and quantitative methods to address the unreached problems.

Conflicts of Interest - The authors declare that they have no competing interests.

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Authors' contributions

SG: initiated the idea, develop the proposal, recruit data collectors, data entry, statistical analysis, interpretation of the

data and writing the manuscript. AD: edit the proposal, gave constructive comments to increase quality of the study, data entry, statistical analysis and critically revised the manuscript. Both authors read and approved the final manuscript.

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