

Development and validation of psychosocial problems scale for type 2 diabetes (PPSTD)

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Abstract

Objective: To develop and validate the Psychosocial Problems Scale for type 2 diabetics.

Methods: The study was conducted at Lahore from November 2017 to July 2018 in three phases. The first phase related to item generation in which endorsements was taken from experts. In the second phase, a pilot study was conducted and in the third phase, psychometric properties were established. In the third phase, the scale was administered on a sample of diabetics aged 30-60 years. Exploratory factor analysis was used to establish construct validity of the scale. Correlation was carried out to establish concurrent validity of the scale with Depression Anxiety and Stress Scale and Psychosocial Problems Scale for type 2 diabetics.

Results: The mean age of 395 subjects was 47.19 ± 8.76 years. Three factors that emerged from factor analysis were social/occupational, sexual life satisfaction and psychological. Significant positive correlation ($p < 0.001$) was found with both the scales. To establish the discriminant validity, correlation was computed and significant negative correlation ($p < 0.01$) was found between Satisfaction with Life Scale and Psychosocial Problems Scale for type 2 diabetics ($p < 0.05$).

Conclusion: The psychosocial problem scale for type 2 diabetics was found to be a valid and reliable tool to identify psychosocial problems of patients with type 2 diabetes.

Keywords: Type 2 diabetes, Sexual satisfaction, Depression, Anxiety, Social problems. (JPMA 70: 964; 2020)

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Introduction

World Health Organisation¹ defines diabetes as "a chronic disease caused by inherited or acquired deficiency in production of insulin by the pancreas, or by the ineffectiveness of the insulin produced." There are two principal forms of diabetes. In type I diabetes (formerly known as insulin-dependent) the individual is completely dependent on insulin because in this type the pancreas fails to produce the insulin which is essential for survival. Type I is most often seen in children and adolescents, but now it is observed in later stage of life too.

Patients with type 2 diabetes mellitus (T2DM) are not completely dependent on insulin for survival. In T2DM, the pancreas produces insulin, but the body is unable to properly utilise that insulin. The most common type of diabetes is T2DM and it is most often observed in adults, but now it is being identified in children as well.²

In Pakistan, the prevalence of T2DM is 11.77% (11.20% in males and 9.19% in females). The mean prevalence of T2DM in males and females is 16.2% and 11.70% in Sindh, 12.14% and 9.83% in Punjab, 13.3% and 8.9% in

Balochistan and 9.2% and 11.60% in Khyber Pakhtunkhwa (KP). In urban areas, the prevalence is 14.81% and 10.34% in rural areas of Pakistan. Statistics indicated that incidence of T2DM is higher in males than females and less common in rural areas compared to urban areas.³

Diagnosis of any disease brings with itself a number of psychosocial problems. The term 'psychosocial' involves both psychological and social aspects of one's life. When we talk about psychosocial problems of a disease, it refers to the influence of an illness on social and psychological functioning of the affected person. Similarly, the common psychosocial problems associated with the diagnosis of diabetes include fear, crying, anger, and feelings of impotence or being out of control,⁴ relative's negative attitude, difficulty in following the treatment regimen especially at workplace, worrying about inability to fulfil their familial responsibilities etc. All such problems are also experienced by T2DM patients in Pakistan.^{5,6}

A qualitative study was conducted to explore the experiences of older Singaporean Chinese women with T2DM. It was observed that participants experienced frequent urination, lethargy, sleep deprivation, anxiety, helplessness, loss of motivation and hope, fear of needles, cost of reagent strips and a lack of empathy from healthcare providers. It was discovered that some patients liked to hide their disease from their friends

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because they thought that disclosing their disease would affect their relationship.⁷ Male and female patients with diabetes both experienced sexual problems⁶⁻⁹ but in general these problems increase with age.¹⁰ It has been observed that psychosocial factors have an impact on sexual functioning.¹¹

Literature indicates that the prevalence of diabetes is very high worldwide. Likewise, the rate of diabetes is increasing in Pakistan as well^{12,13} which is very alarming. Diabetes affects patients at multiple levels, including social, physical and psychological. There is no indigenous scale to identify the psychosocial problems of T2DM patients. The current study was planned to develop a scale which can identify the diabetic's psychosocial problems.

Subjects and Methods

The study was conducted at Lahore from November 2017 to July 2018 in three phases. The objective of the first phase was to generate items for the proposed Psychosocial Problems Scale for type 2 diabetics (PPSTD). It lasted from November, 2017, to January, 2018. For item generation, literature was reviewed and semi-structured interviews were conducted. Interviews were conducted in Urdu language. The face validity and content validity of the proforma was established. Items were derived from four sources. i.e., previous literature both local and foreign, and semi-structured interviews from 4 T2DM patients, 3 clinical psychologists and 3 diabetologists. Finally, a list of 83 items was generated.

In the second phase, which lasted from January to February, 2018, empirical validation was targeted through construct and content validity for which endorsements were taken from two clinical psychologists and one diabetologist. After taking endorsements, frequencies were computed and on that basis, 38 items were deleted because they were showing more than 20% endorsement on "No" response format. Finally, 45 items were retained for pilot study which was conducted on 15 men and 15 women aged 30-60 years. They were asked to note if they encountered any difficulty in filling the questionnaire related to its content and construct. The participants reported that they faced difficulty in answering items 15 and 27. The items were re-evaluated with the help of the supervisor and the two items were rephrased. All the items were retained for the final phase which was about establishing psychometric properties.

The third phase lasted from March to July, 2018, and comprised a questionnaire that was administered on a sample of married T2DM patients of either gender aged 30-60 years from Lahore city of Pakistan. According to

Kline,¹⁴ the number of participants should be at least 100 for factor analysis. Adequate sample size guidelines provided by Comrey and Lee¹⁵ is 100=poor, 200=fair, 300=good, 500=very good, 1,000 or more=excellent. Thus, the sample size was appropriate for factor analysis. The sample was selected through purposive sampling technique and cross-sectional research design was used. Pre-diabetics, patients with type I diabetes and with gestational diabetes were excluded.

There were three instruments used in the study. The PPSTD was developed in Urdu language and had 45 items. Five-point Likert scale was used ranging from 0 to 4. After collecting data, factorial validity and psychometric properties of the scale were determined.

The Depression, Anxiety and Stress scale (DASS) was developed in 1995¹⁶ and has 42 items with three equal subscales. DASS is a four-point scale ranging from 0 "did not apply to me at all" to 3 "applied to me very much or most of the time". To establish the relationship between two questionnaires i.e, DASS and PPSTD, bivariate correlation was computed.

The third instrument was the Satisfaction With Life Scale (SWLS)¹⁷ which was used along with PPSTD to find out the discriminant validity of the scale. SWLS is a short 5-item instrument designed to measure global cognitive judgment of satisfaction with one's life. It has a 7-point rating scale that ranges from 1 "strongly disagree" to 7 "strongly agree."

First of all, permission was taken from the Diabetic's Institute of Pakistan (DIP) and the Jinnah Hospital, Lahore, and informed consent was obtained from the participants. Instructions were given to the participants about PPSTD. They were instructed to read the items carefully and select only one option from the given response format which is the best according to them. They were also instructed not to skip any item. All the data was taken anonymously and the participants were assured of confidentiality. After collecting data, factorial validity and psychometric properties of the scale were determined.

To establish the convergent validity, a sample of married diabetics of either gender aged 31-60 years was selected using purposive sampling technique. To establish the discriminant validity, a separate sample of married diabetics of either gender aged 35-60 years was selected.

Result

Of the 395 T2DM patients, 202(%) were men, and 193(%) were women. The overall mean age was 47.19 ± 8.76 years. Exploratory factor analysis with varimax rotation was used

Table-1: Factor loadings for explanatory factor analysis with varimax rotation of psychosocial problems scale for type 2 diabetes (N=395).

Item No.	F1	F2	F3
1	.58	.15	.20
2	.00	.31	.56
3	.53	.15	.09
4	.64	.07	.00
5	.32	-.01	.41
6	.44	.30	.34
7	.15	.06	.70
8	.47	.12	.56
9	.54	.07	.55
10	.33	.03	.40
11	.31	.41	.45
12	.18	.29	.57
13	.08	.18	.78
14	.63	.10	.01
15	.29	.24	.31
16	.45	-.05	.51
Item No.	F1	F2	F3
17	.30	.10	.53
18	.05	.09	.40
19	.75	.31	.07
20	-.00	.38	.74
21	.55	.17	-.25
22	.77	.31	.08
23	.17	.25	.77
24	.28	.22	.64
25	.75	.24	.18
26	.77	.16	-.00
27	.73	.24	.17
28	.50	.42	.15
29	.67	.21	.07
30	.55	.38	-.02
31	.39	.55	.14
32	.47	.56	.12
33	.20	.71	.05
34	.61	.09	.17
35	.65	.33	.09
Item No.	F1	F2	F3
36	.60	.32	.05
37	.78	.30	.03
38	.67	.42	.03
39	.39	.59	.18
40	.25	-.32	.19
41	.01	.79	.07
42	.22	.70	.06
43	.61	.07	.12
44	.43	.37	-.07
45	.43	.32	-.10
Eigen Value	17.28	3.14	2.38
% of Variance	38.41	6.99	5.30
Cumulative Variance	38.41	45.41	50.71

Note: Factor loadings > .30 have been boldfaced.

Table-2: Cronbach Alpha of the Three Factors and Factor Total of PPSTD (N=395).

	No. of Items	Alpha Coefficient
F1 - Social/ Occupational	22	.94
F2 - Sexual	7	.83
F3 - Psychological	16	.89
FT - Total	45	.96

PPSTD: Psychosocial Problems Scale for type 2 diabetics.

Table-3: Mean, Standard Deviation and Correlation between psychosocial problems scale for type 2 diabetes and its social/occupational, sexual and psychological factors (N=395).

Measures	Social factor	Sexual factor	Psychological factor	Total diabetes
Social factor	-	.673**	.816**	.972**
Sexual factor	-	-	.528**	.735**
Psychological factor	-	-	-	.911**
Total diabetes	-	-	-	-
M	37.38	12.30	38.80	88.49
SD	19.88	5.68	12.71	35.08

M: Mean; SD: Standard deviation.

to discover its main dimensions or constructs. Bartlett's test of sphericity was significant ($p < 0.01$) Kaiser-Meyer-Olkin (KMO) test was highly satisfactory at 0.91 to run a principal-component factor analysis. Scree plot graphically determined the number of factors in a scale, and five factors were revealed whose Eigen values were >1. Series of factor analysis i.e., two, three, four and five factor solutions were carried out to get a clear picture. Finally, three-factor solution was retained because it gave a clearer picture with fewest number of cross loadings.

All the 45 PPSTD items were retained and no item was discarded. The doubtful items were added into three factors which had similar characteristics. The three factors that emerged from the factor analysis were social/occupational, sexual life satisfaction and psychological. The first factor was social/occupational, which revealed the social and occupational problems of T2DM patients. This factor contained 22 items (i.e., 1, 3, 4, 6, 14, 19, 21, 22, 25, 26, 27, 28, 29, 30, 34, 35, 36, 37, 38, 43, 44, 45). The second factor was related to the sexual life satisfaction and this factor contained 7 items (i.e., 31, 32, 33, 39, 40, 41, 42). The third factor contained 16 items (i.e., 2, 5, 7, 8, 9, 10, 11, 12, 13, 15, 16, 17, 18, 20, 23, 24) and this factor was about the psychological problems of T2DM patients (Table-1).

Cronbach alpha coefficient was used to calculate internal consistency of PPSTD. The alpha reliability of the scale was significantly high at 0.96 (Table-2).

There was a significant positive correlation between psychosocial problems scale and its social/occupational, sexual life satisfaction and psychological factors (Table-3).

To establish the convergent validity, a sample of 100 subjects was raised comprising 50(50%) males and 50(50%) females with an overall mean age of 44.94 ± 8.39 years (range: 30-60 years). Most of them 84(84%) were educated. Bivariate correlation was carried out to establish concurrent validity between two scales and it was found that there was a moderately significant correlation ($r=0.568$, $p<0.001$) between the two scales.

To establish the discriminant validity, a separate sample of 100 was raised, comprising 50(50%) men and 50(50%) women. The overall mean age was 46.18 ± 8.93 years (range: 30-60 years). There was significant negative correlation ($r=-0.66$, $p<0.01$) between SWLS and PPSTD.

Discussion

The origin of diabetes can be traced back to prehistoric times. Now diabetes is becoming a deadly disease globally and the prevalence of diabetes is also increasing rapidly. Living with diabetes is very difficult and patients face many problems.¹⁸ Many scales have been developed to assess psychosocial problems of diabetics, but there is no scale in Pakistan which may measure psychological, social and sexual factors. There are scales which measure only one or two factors like problem areas in diabetes (PAID)¹⁹ and diabetes distress scale (DDS)²⁰ measure emotional burden, interpersonal distress and regimen related distress. On the other hand, index of sexual satisfaction (ISS)²¹ measures the degree of sexual satisfaction. In it social and psychological factors are missing. Moreover, these available scales are established in the Western culture. So, there was a need to develop an indigenous scale which may reflect the psychosocial problems of T2DM patients in Pakistan because people of every culture have different perceptions, expressions and experiences. The present research aimed at developing and validating an indigenous scale for psychosocial problems of type 2 diabetics. The scope of the study was quite large as different samples were taken in each validation study. During factor analysis, the three factors that emerged were social/occupational, sexual life satisfaction and psychological factors.

The social/occupational problems included items related to relatives; negative attitude, difficulty in following the treatment regimen, especially at workplace, worrying about inability to fulfil familial responsibilities etc. Similar findings were also reported earlier.²²

The sexual life satisfaction factor included items related to

lack of energy, lack of interest in sex etc. Previous research showed that sexual inactivity was highly prevalent among men (17%) and women (47%) with type 2 diabetes.^{23,24}

The psychological problems included items related to anger, denial, fear and depression, frustration etc. Previous researches also support the findings.^{4,7}

Overall factor analysis of psychosocial problems scale for patients with type 2 diabetes revealed similarities to studies conducted in the Western culture.^{25,26} Items of the scale indicated the problems experienced by patients with type 2 diabetes in Pakistani culture.

To establish the convergent validity, it was found that PPSTD correlated significantly with DASS. A positive correlation with DASS does not minimise the importance of PPSTD. The discriminant validity was ensured by obtaining the significant negative correlation between PPSTD and SWLS. Negative relationship was found significant, but threat of diabetes has also been shown to be associated with lower self-esteem, decreased happiness and reduced life satisfaction.^{27,28}

In terms of limitations, the sample only involved married patients of Lahore, and the sample size was too small and narrow to allow generalisation of the findings. It is recommended that data shall be collected from both rural and urban areas of Pakistan. To raise awareness in the general public, community workshops should also be conducted.

Conclusion

PPSTD was found to be a valid and reliable scale to identify psychosocial problems of patients with type 2 diabetes. It also had a high internal consistency.

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