Background & Objective: Quality of life has been affected by numerous psychosocial factors. Thus, for diabetic patients, it was necessary to identify the underlying factors, keeping in view the cultural norms. The objective of the current study was to validate the cultural norms of DSQOL (Diabetes-Specific Quality of Life Scale) through translation into “Urdu” language.

Methodology: A correlational research design was used in the study. Initially, the forward and backward translation method was followed to translate DSQOL. Afterward, the final Urdu translated version (20 items) was tested on a representative sample of 200 diabetic patients to establish its psychometric properties.

Results: Internal consistency and correlational matrix of original, Urdu, and English scales yielded reliable results. In the main study, 200 male and female diabetic patients with an age range of 30-70 years and an average of (M±SD; 45±8.25) participated. The reliability analysis showed a significant alpha coefficient for five subscales; “Social relations (α=.80), Physical complaints (α=.90), Worries about the future (α=.88), Daily hassles (α=.88), and Emotional worries (α=.87)”. The item analysis of Urdu version confirmed the item total correlation of all subscales except three items. Further, CFA confirmed the factor structure of the newly translated Urdu version of DSQOL through AMOS (Analysis of Moment Structure), and the model yielded acceptable model fit indices (CFI=.90; NFI=.90). The Final Urdu version of DSQOL had 20 items.

Conclusion: The Urdu version of DSQOL is a valid and reliable measure for assessing the diabetics-specific quality of life. This translated tool overcame the cultural barrier with respect to language and norms.

Keywords: Diabetes Specific Quality of Life (D-QOL), Diabetes, Quality of Life.
on psychological parameters is of key importance by considering the impact of such protracted disease and its treatment on individuals' physical, social, and mental well-being[9].

However, the causation of dysfunctionality does not depend only on certain medical conditions but also individual's attitude towards his/her self-care [3], and the role of social support (e.g., the quality of family relationships, peer groups, and the relationship with healthcare personnel). Because these factors are highly associated with treatment adherence which helps in managing it [3]. The long-term impact of all chronic diseases and their treatments on the patient's quality of life (QOL) and normal living standards is a major concern for the patients, their families, and physicians as well. This is particularly relevant in the case of patients suffering from diabetes because the bio-psychosocio/cultural burden of diabetes negatively affects patients' self-care behaviors, relationships, management of disease, its therapeutic adherence, and consequently, the Quality of Life (QOL) [10,11].

However, despite the clear understanding of the scientific and clinical community about the importance of giving voice to diabetic patients regarding their specific health-related QOL, especially within cultural boundaries, there is no clear agreement about the operational definition of such measures used, especially in collectivistic countries like Pakistan[9]. So, the objective needs a deeper comprehension of such measures to develop better suggestions and eligibility criteria to orient clinical practitioners and researchers in the development of the most reliable and specific measurement tool according to the culture and language-specific population. In the current clinical practice, it would directed to develop cultural adaptive tools to measure the level of patients' perceived diabetic-related quality of life. The prevalence rate of diabetes in Pakistan is 17%, especially Type II, due to a rich carbohydrate diet. Moreover, the rate is expected to rise by about 30% in 2030, highlighting the current demand to control the vulnerabilities of this problem [13].

The Diabetes Specific Quality of Life Scale (DSQOL) was first developed in English version and administered to determine the quality of diabetic patients under care in the diabetic care unit in Germany [13]. The majority of Pakistani patients are not well versed in the English language, as Urdu is the national language of Pakistan. The original scale was very lengthy and time-consuming. Half of the items were repeated, which may cause the fatigue effect. Hence, the present study was conducted to develop an Urdu short version of (DSQOL) to develop a better understanding of diabetics' quality of life and to reduce the fatigue effect among Pakistani patients.

### METHODOLOGY

It was quantitative research in which a correlational research design was used. The ethical approval was obtained from the institutional ethical review committee (Reference no GCU. IRB/334. An in-person data collection model was used to approach diabetic patients from clinics and residential areas of Lahore and Fort Abbas. Moreover, these patients were also seeking treatment from private and government hospitals. A purposive sampling technique was used to collect the data from the respective population. The final sample was calculated by multiplying the "(n=10)" number of participants by item numbers. It consisted of 200 diabetic patients with an age range of 30-70 years comprising males (n=90) and (n=110) females.

The inclusion criteria were confirmed through the doctor's diagnosis and prescription given to participants. It included patients who had diabetes and were seeking treatment. Diabetic patients having visual, auditory, and physical impairments were excluded. Moreover, those who were not taking treatment and in the age range below 30 and above 70 were also excluded from the study. The demographic variables that were used in this study were gender, age, marital status, education, and duration of the disease.

Diabetes-Specific-Quality of Life Scale (DSQOL) was developed to assess the Quality of Life of individuals with diabetes by distinguishing them from different treatment and dietary regimes. The scale was composed of 77 items, including 3 subscales: individual treatment goals (10-items); treatment success (10-items); diabetes-related distress (57-items) with five Likert scale answer formats. Diabetes-related distress of DSQOL had 8-subscales such as social relations, leisure time, daily hassles, physical complaints, emotional worries, worries about the future, diet restriction, and problems related to low blood sugar [13].

Diabetes-Specific-Quality of Life Scale Urdu Short Version Urdu short version of DSQOL was an assessment tool used to measure the diabetic's specific quality of life of Urdu-speaking participants with age ranges from 30-70 years. This construct comprised of 20-items including five factors social relations (4-items), physical complaints (4-items), daily hassles (4-items), emotional worries (4-items), and worries about the future (4-items), with a five Likert scale answer format.

**Procedure:**

#### Stage 1: Translation

Stage 1 was carried out in five steps: Forward translation, the best Urdu-translated questionnaire was selected by using the committee approach; backward translation, the selection of the best English questionnaire by using the committee approach; and Cross-language validation of DSQOL.

**Step 1: Translation of (DSQOL) into the Urdu language.** For the urdu translation of DSQOL 3 PhD bilinguals of university professors were approached. Translators were requested to use such words in translation that can be easily understood in Pakistani culture. For each item, three options for Urdu translation were presented.

**Step 2: Selection the best Urdu-translated version of (DSQOL) by using the committee approach.** The three PhD professors of Psychology from the psychology department of GC University Lahore were approached for the selection of
the best Urdu translation. The final draft was accomplished with the best Urdu translation for each item.

**Step 3: Backward translation of (DSQOL) into English.** Urdu translation was selected and further given to three English bilingual teachers of the English Department from GC University Lahore. One of them was PhD, and the rest of the two were M.Phil. English. All three faculty members were requested to translate DSQOL (Urdu version) into English.

**Step 4: Selection of the best English translation version of (DSQOL) by using the committee approach.** Three Professors of Psychology were approached again. They selected the back translation that was very close to the original version of DSQOL (Diabetes specific quality of life scale). Moreover, 6 overlapping items were also excluded due to the same meaning, such as diabetes has controlled my life and relationships, restricted my diet, and the thought of being diabetic bothers.

**Step 5: Cross-language validation of (DSQOL).** In cross-language validation (n=20) participants, including (n=5) males and (n=15) females, were approached. These diabetic patients were highly qualified and had proper command of both languages of Urdu and English.

**Stage II: Validation Study**

The final translated version of the DSQOL was administered to the target population. Participants were selected by keeping under consideration their ability to understand the Urdu language. Following demographics of the research sample (n=200), age, gender, education, marital status, and duration of disease were confirmed by measuring the frequency percentage. Moreover, descriptive, reliability analysis, Item analysis, and confirmatory factor analysis were conducted to confirm the factor structure of the newly adapted and translated DSQOL Urdu short version.

This research followed research ethics ERC/IRB No. GCU/ IIB/334. First of all, the author's permission for scales was taken via email. After that, informed consent was taken of the targeted population which highlighted the purpose of the study and assured them that participation in this study would not cause any harm or damage. Further, the participants have been given the right to withdraw from the research at any time. Moreover, it ensured that their personal information would be kept confidential and would be utilized solely for research purposes.

Each participant took 10-15 minutes on average to complete the questionnaire. The duration of the whole study was estimated around 6 months, from January 2018-June 2018.

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**RESULTS**

The result section is comprised of two phases. In phase I, psychometric properties and inter-scale correlation were found. Moreover, phase II comprised the main study, in which factor analysis yielded satisfactory factor loadings for 20-items of the newly translated Urdu version of DSQOL.

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**Phase I: Translation**

**Table-I: Psychometric properties of diabetes specific quality of life scale original, Urdu, and English (n=20).**

<table>
<thead>
<tr>
<th>Scale</th>
<th>k</th>
<th>M±SD</th>
<th>α</th>
</tr>
</thead>
<tbody>
<tr>
<td>Original DSQOL</td>
<td>57</td>
<td>199.1±32.86</td>
<td>.93</td>
</tr>
<tr>
<td>Urdu DSQOL</td>
<td>57</td>
<td>194.7±39.28</td>
<td>.95</td>
</tr>
<tr>
<td>English DSQOL</td>
<td>51</td>
<td>195.1±39.23</td>
<td>.95</td>
</tr>
</tbody>
</table>

Note: α=Cronbach Alpha, k=total items, M±SD=Mean±Standard Deviation

Table-I indicates the internal consistency of all the scales. It was estimated by using the Cronbach Alpha Co-efficient. The estimates of internal consistency reliability of the original version of DSQOL were considerably high (α=.93), the reliability of the Urdu version of DSQOL was slightly higher than the original version (α=.95), and the reliability of the backward translated English version of DSQOL was also higher than the original version of DSQOL (α=.95).

**Table-II: Correlation matrix among diabetes-specific quality of life scale (n=20).**

<table>
<thead>
<tr>
<th>Variables</th>
<th>I</th>
<th>II</th>
<th>III</th>
</tr>
</thead>
<tbody>
<tr>
<td>I DSQOL Original</td>
<td>-</td>
<td>97**</td>
<td>.98</td>
</tr>
<tr>
<td>II DSQOL Urdu</td>
<td>-</td>
<td>-</td>
<td>.97**</td>
</tr>
<tr>
<td>III DSQOL English</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

Note: **p<.01, Diabetes-specific quality of life scale original version (DSQOL-O), Diabetes-specific quality of life scale Urdu translation (DSQOL-U), and Diabetes-specific quality of life scale English translation (DSQOL-E).

Table-II indicated that there is a significant, positive correlation between diabetes-specific quality of life scale (O) and diabetes-specific quality of life scale (U). (r=.97, p<.01), and positive, significant correlation between diabetes-specific quality of life scale (O) and diabetes-specific quality of life scale (E). (r=.98, p<.01). Results also suggest that there is a positive, significant correlation between diabetes-specific quality of life scale (U) and diabetes-specific quality of life scale (E). (r=.97, p<.01). These results support the concurrent validity of the Urdu translation of diabetes-specific quality of life scale.

**Phase II: Validation Study**

The main study comprised descriptive, reliability, and confirmatory factor analysis of (N=200).

The above table-III shows the frequency distribution of demographic variables. The results indicated an increased number of participants in the age range of 40-50 years, whereas a greater number of females participated as compared to males.

Table-IV indicates the estimation of reliability. The researcher set the standard value (α=.75). The results indicated that the Cronbach Alpha Co-efficient of five subscales comprised of 40 items was significant. These were "Social relations (α=.80), Physical complaints (α=.90), Worries about the
future (α=.88), Daily hassles (α=.88), and Emotional worries (α=.87). But the values of the following three subscales "Diet Restriction (α=.64), Leisure time (α=.44), and Low blood sugar (α=.67) consisted of 11-items were non-significant as the Cronbach alpha values were below the standard value of .75. So, these subscales were excluded.

Table III: Demographic characteristics of study participants (N=200).

<table>
<thead>
<tr>
<th>Categories</th>
<th>n(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td></td>
</tr>
<tr>
<td>30-40 years</td>
<td>80(40.0)</td>
</tr>
<tr>
<td>40-50 years</td>
<td>85(42.5)</td>
</tr>
<tr>
<td>50-60 years</td>
<td>20(10.0)</td>
</tr>
<tr>
<td>60-70 years</td>
<td>15(7.5)</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>90(45.0)</td>
</tr>
<tr>
<td>Female</td>
<td>110(55.0)</td>
</tr>
<tr>
<td>Marital Status</td>
<td></td>
</tr>
<tr>
<td>Married</td>
<td>195(97.5)</td>
</tr>
<tr>
<td>Unmarried</td>
<td>5(2.5)</td>
</tr>
<tr>
<td>Education</td>
<td></td>
</tr>
<tr>
<td>Literate</td>
<td>180(90.0)</td>
</tr>
<tr>
<td>Illiterate</td>
<td>20(10.0)</td>
</tr>
<tr>
<td>Duration of Disease</td>
<td></td>
</tr>
<tr>
<td>1-10 years</td>
<td>157(78.5)</td>
</tr>
<tr>
<td>11-20 years</td>
<td>39(19.5)</td>
</tr>
<tr>
<td>21-30 years</td>
<td>4(2.0)</td>
</tr>
</tbody>
</table>

Figure-I: Confirmatory Factor Analysis (CFA) showing the final Factor Structure of (DSQOL) Urdu version.

The study aimed to translate and validate the Urdu short version of the Diabetes Specific Quality of Life Scale (DSQOL). The Urdu DSQOL was carried out on 200 diabetic patients. Translation and cross-validation led to the best Urdu DSQOL version. Item-total correlation revealed issues in three items (diet restrictions, social relations, and low blood sugar). Reliability analysis indicated significant Cronbach alpha values for five subscales (social relations, daily hassles, physical complaints, worries about the future, emotional worries), but not for certain items in subscales like diet restrictions, leisure time flexibility, and low blood sugar problems. Confirmatory factor analysis (CFA) initially showed poor fit, but after adjustments, a statistically well-fitted model was achieved. The final version included 20 items across 5 subscales.

In the subscale "social relations," items highlighted challenges like others finding diabetes unattractive, restricted relationships due to diabetes, social perceptions. In the "emotional worries" subscale, items indicated feeling upset, worried due to diabetes-related issues[14,15,16,17,18]. The "physical complaints" subscale items pointed to pain, skin problems, fatigue, and dry mouth. The "worries about the future" subscale items reflected concerns about health, lifespan, diabetes complications, and low sugar problems. The "daily hassles" subscale items addressed difficulties in traveling, carrying medicine, and dissatisfaction with treatment time. These five domains of the Urdu DSQOL were validated as the factor loadings of these items were (.40)[19, 20, 21, 22].

LIMITATIONS: The translated Urdu short version of the Diabetes Specific Quality of Life Scale (DSQOL) has been validated on a sample of patients residing in Lahore.
Researchers and clinicians may extend this work to validate its psychometric properties by collecting data from other provinces of Pakistan or may translate this scale into their specific regional languages as well.

**CONCLUSION**

Several measures of diabetic-specific quality of life exist in the scientific literature that are culturally specific in terms of norms and language. In Pakistan, the majority of the people have Urdu as their first language. Therefore, the Western measures were not easy to understand. Moreover, the underlying factors of quality of life vary in cultures due to the nature of the family system and approach to culture. Thus, in Pakistan, collectivistic culture helped the patients to combat such chronic illnesses. The administration of Western tools is much more difficult due to language and cultural barriers. Thus, it would direct the researcher to identify the risk factors within the cultural context and help them to discriminate between individuals on various dietary regimens and medical treatments.

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Authors Contribution:

Laraib Javaid: Did data collection, translation, manuscript writing, analysis and final results writing.
Nasreen Akhtar: Conceived, designed, and did statistical analysis & manuscript writing.
Ifat Batool: Substantial contributions to the conception and design of the work.
Muhammad Zohaib Khan: Drafting the work and reviewing it critically for important intellectual content.

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