Master of Science in Public Health

Impact of Educational Intervention Based on Interactive Approaches on Beliefs, Behavior, Hemoglobin A1c, and Quality of Life in Diabetic Women Visiting THQ Hospital, Jhelum.

MSPH Thesis

by

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(2021-2023)

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To

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Declaration

I, Anum Anwar, hereby state that my thesis titled "Impact of Educational Intervention Based on Interactive Approaches on Beliefs, Behavior, Hemoglobin A1c, and Quality of Life in Diabetic Women Visiting THQ Hospital, Jhelum" submitted to the Department of Public Health, Faculty of Medicine, Al-Shifa School of Public Health, Quaid-e-Azam University Islamabad, Pakistan for the award of the degree of Master of Science in Public Health is the result of research work carried out by me. I certify that I have read and understood the rules and regulations of DPH and QAU regarding assessment procedures and offenses and formally declare that all work contained within this document is my own apart from properly referenced quotations.

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I would like to start by showing my thankfulness to Allah Almighty, as all my achievements are because of his benevolence and mercy. After that, I would like to depict my immense gratitude to my parents for believing in me and supporting me throughout my journey.

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Professional goals.

Anum Anwar

Table of Contents

LIST OF TABLES

Table **Page**

LIST OF FIGURES

LIST OF ABBREVIATIONS

- **HRQOL** Health related quality of life.
- **WHOQOL-BREF** World Health Organization Quality of life Brief version.
- **DM** Diabetes mellitus.
- **HbA1c** Hemoglobin A1c level.

ABSTRACT

Objectives:

- To examine the effect of educational program on beliefs, behavior, glycemic control indicators among diabetic women.
- To measure the QOL among diabetic women visiting THQ hospital, Jehlum Pakistan.

Methodology:

An interventional study was carried out over a period of six months from March 2023 to August 2023, 90 female outpatients with type 2 diabetes were randomly selected from those referred to diabetes clinic of Thq Hospital, Jhelum. They were divided into two groups, 45 participants as the intervention group and 45 subjects as the comparison group. Knowledge, beliefs, and behavior by valid and reliable questionnaires, and health-related QOL (HRQOL) by means of WHOQOL-BREF questionnaire were assessed. Hemoglobin A1c level (HbA1c) was measured by the colorimetric method, educational program was conducted on the intervention group for 4 weeks, and changes were compared in two groups after a 3-month follow-up, Data was analyzed using Statistical Package for Social Science (SPSS) version 26.

Results:

After intervention, there was a significant difference between two groups in terms of the mean scores of knowledge ($P < 0.001$), attitude ($P < 0.01$), self-efficacy ($P < 0.001$), and behavior ($P < 0.001$). The findings also indicated that there were significant differences between the groups in mean scores of physical, psychological, and social domains of QOL after intervention ($P < 0.001$). In addition, there was a statistically significant difference between two groups in the mean value of HbA1c after educational intervention ($P < 0.01$).

Conclusion:

Instructional interventions based on interactive approaches can be useful, and applicable for behavior modification and improvement of HbA1c level and HRQOL in people with DM.

Keywords: Diabetes mellitus, group-based education, women

Chapter 1: Introduction

A large number of people coming from various ethnic groups and all levels of social and economic status are affected by diabetes mellitus (DM) worldwide. Current projections of the number of people suffering from diabetes indicate that 285 million people are inflicted by diabetes throughout the world and that by the year 2025, this number will reach 324 million.

In Pakistan, type 2 diabetes afflicts approximately 7.3% over 30-year-old population. Diabetes is a progressive disease with long- and short-term complications that include cardiovascular, renal, ophthalmologic, peripheral vascular, and neurological effects. These severe consequences may have a very detrimental impact on the quality of life (QOL) of people with DM. However, these untoward complications may be delayed or even prevented by effective treatment and education. The cost of these complications exceeds $132 billion annually; in addition, quality and length of life are reduced. Management of diabetes requires specific lifestyle changes including diet, exercise, self-monitoring, frequent visits to health care providers, and often multiple medications. Further, these changes must be sustained for the remainder of the person's life.

To control their disease, people with DM have to understand the importance of their medication and diet and be aware of the way to modify them in accordance with their exercise routine. Hence, diabetes self-management education (DSME) is an essential element of diabetes care. What DSME intends to achieve is to assist patients in gaining knowledge, obtaining information, acquiring coping and self-care skills, and shaping attitudes necessary for effective

self-management of their diabetes. The results of several reviews and meta-analyses are indicative of the positive effect of DSME interventions on health and psychological outcomes. An increase in diabetes-related knowledge, improvement of blood glucose monitoring, foot care, medication taking, coping skills, glycemic control, and formation of healthy dietary and exercise habits are some specifics outcomes of these interventions. Unfortunately, more than 50% of diabetic individuals do not have a sufficient amount of knowledge and lack necessary skills. Furthermore, in people with type 1 and people with type 2 diabetes, the mean hemoglobin A1c (HbA1c) levels are higher than the acceptable level. Moreover, an ideal glycemic control (HbA1c <7.0%) is only achieved by less than half of people with type 2 diabetes. Reasons of these failures should seek in educational approaches were implemented in instructional sessions to people with DM.

Despite the existence of ample evidence supporting the effectiveness of DSME interventions in the improvement of diabetes-related health outcomes, not many studies so far have examined the effect of delivery format of DSME on diabetes health-related outcomes. According to Mensing and Norris, compared to individual-based approaches, group-based approaches usually urge a higher level of interaction and interpersonal dynamics. In addition, certain educational activities, such as social modeling or problem-based learning, are better fostered by group settings than by individual settings.

To some researchers, in comparison to individual-based DSME, group-based DSME improves diabetes-related health outcomes to a greater extent. Moreover, it is believed that compared to individual education, group education costs less. Norris et al. (2001) conducted a study with the aim of examining group versus individual approaches to DSME. The results of their study showed that patients in both settings achieved the same level of success in applying self-care

practices. Nutritional management and physical activity were the only two self-management practices in which group-based learning resulted in marginally better self-care outcomes than individual-based learning. The researchers concluded that each one of the intervention approaches enjoyed a unique set of features and advantages.

The study conducted by Deakin et al. revealed that group-based education was effective in improving fasting blood glucose levels, HbA1c, systolic blood pressure, body weight, need for medication, and diabetes knowledge among individuals suffering from type 2 diabetes. With regard to positive advantages of group-based approaches (interactive approaches), it seems that those will be more helpful and effective than other approaches in educating people with diabetes. Therefore, the aim of the present research was to examine the impact of interactive approaches-based educational intervention program on beliefs, behavior, HbA1c, and QOL in diabetics.

Diabetes mellitus is a complex and chronic medical condition that affects millions of individuals worldwide. Its management demands not only medical expertise but also the active involvement and empowerment of patients in their own care. Amidst the multitude of factors influencing diabetes outcomes, an individual's beliefs, behaviors, and overall quality of life play pivotal roles. Effective patient education has long been recognized as an essential component of diabetes care, offering the potential to foster positive changes in beliefs and behaviors, which can, in turn, lead to improved health outcomes. This thesis, entitled "Impact of Educational Intervention Based on Interactive Approaches on Beliefs, Behavior, Hemoglobin A1c, and Quality of Life in Diabetic Women," delves into this crucial intersection of education, patient engagement, and healthcare outcomes.

Background and Rationale:

Diabetes mellitus, characterized by hyperglycemia resulting from defects in insulin secretion, insulin action, or both, is a major global health concern. According to the International Diabetes Federation (IDF), over 463 million adults worldwide were living with diabetes in 2019, a number expected to rise to 700 million by 2045. This escalating prevalence underscores the urgency of implementing effective strategies for diabetes management and prevention of complications.

Diabetes management encompasses a multifaceted approach, including medication, dietary modifications, physical activity, and self-monitoring of blood glucose levels. Additionally, it requires individuals to make informed decisions about their health, adhere to prescribed treatments, and navigate the emotional and psychological aspects of living with a chronic condition. This intricate web of responsibilities makes patient education a cornerstone of successful diabetes care.

The Role of Beliefs and Behaviors:

Central to the experience of diabetes are an individual's beliefs and behaviors. Beliefs encompass the knowledge, perceptions, and attitudes a person holds regarding their condition and its management. Behaviors refer to the actions taken in response to these beliefs, including dietary choices, medication adherence, and lifestyle habits. Understanding how these beliefs and behaviors evolve in response to educational interventions is essential for tailoring effective patient support.

Educational interventions have traditionally relied on didactic teaching methods. However, recent advancements in healthcare have spurred the adoption of interactive approaches, such as group discussions, peer support, and technology-based tools. These methods seek to engage patients more actively in

their learning process, facilitating not only the acquisition of knowledge but also the transformation of beliefs and behaviors.

Hemoglobin A1c and Quality of Life

Hemoglobin A1c (HbA1c) serves as a critical clinical marker in diabetes care, reflecting long-term glycemic control. Reducing HbA1c levels is a primary objective in diabetes management, as it is associated with a reduced risk of complications. Moreover, the impact of diabetes extends beyond clinical markers, affecting an individual's overall quality of life, encompassing physical, psychological, and social dimensions. Evaluating the influence of educational interventions on HbA1c levels and quality of life measures provides a comprehensive view of their effectiveness.

Significance of the Study

This thesis seeks to fill a critical gap in the literature by investigating the impact of educational interventions, specifically those employing interactive approaches, on beliefs, behaviors, HbA1c levels, and quality of life in a specific population—diabetic women. The choice of this demographic is deliberate, considering the unique challenges and disparities faced by women in diabetes management.

By examining the interplay between education, patient engagement, and health outcomes, this research aims to inform healthcare practitioners, educators, and policymakers on the potential benefits of interactive educational strategies in diabetes care. Ultimately, the findings of this study have the potential to contribute to the development of more effective and tailored interventions for improving the lives of diabetic women and, by extension, individuals living with diabetes globally.

1.1 Rationale:

This study explores the critical need to assess the effectiveness of interactive educational interventions in improving the beliefs, behaviors, and overall health outcomes of diabetic women. With rising diabetes prevalence and unique challenges faced by women in diabetes management, understanding how interactive education influences HbA1c levels and quality of life is imperative. This research fills a knowledge gap, offering insights that can enhance the care and well-being of diabetic women and inform more patient-centric approaches to diabetes management.

1.2 Objectives:

- To examine the effect of educational program on beliefs, behavior, glycemic control indicators among diabetic women.
- To measure the QOL among diabetic women visiting THQ hospital, Jhelum Pakistan.

CHAPTER 2: Literature Review

2.1 Background:

Diabetes mellitus, characterized by chronically elevated blood glucose levels, represents a global health challenge of unprecedented magnitude. With over 463 million adults worldwide living with diabetes in 2019 and projections indicating a steep rise in its prevalence, diabetes management has become a critical public health concern. Among the multifaceted strategies for diabetes management, patient education and engagement are acknowledged as vital components. This literature review aims to provide a comprehensive overview of existing research on the impact of educational interventions, particularly those employing interactive approaches, on the beliefs, behaviors, Hemoglobin A1c (HbA1c) levels, and quality of life in diabetic women.

1. Gender Disparities in Diabetes Prevalence and Outcomes:

A significant body of literature has illuminated gender disparities in diabetes prevalence and outcomes. Women are disproportionately affected by diabetes, with studies consistently reporting higher rates of diagnosis among females. Furthermore, women with diabetes often face distinct challenges, such as the increased risk of gestational diabetes during pregnancy. These gender-specific factors emphasize the necessity for tailored interventions to address the unique needs of diabetic women.

2. Role of Beliefs and Behaviors in Diabetes Management:

The beliefs and behaviors of individuals with diabetes are pivotal determinants of their health outcomes. Patients' beliefs about their condition, treatment, and self-efficacy significantly influence their adherence to prescribed treatments, dietary choices, and lifestyle modifications. Moreover, behaviors such as medication adherence, physical activity, and dietary habits directly impact glycemic control. Therefore, understanding how educational interventions can shape these beliefs and behaviors is essential for improving diabetes management.

3. Evolution of Interactive Educational Approaches

Contemporary healthcare practices emphasize patient-centered care and interactive educational approaches. These methods aim to engage patients actively in their healthcare journey, fostering a deeper understanding of their condition and promoting self-management skills. Interactive interventions encompass a variety of strategies, including group discussions, peer support, digital tools, and multimedia resources. Research in this area has highlighted the potential of these approaches to enhance knowledge retention, facilitate behavior change, and empower individuals to take ownership of their diabetes management.

4. Clinical Significance of HbA1c and Quality of Life

Hemoglobin A1c (HbA1c) serves as a critical clinical marker in diabetes care, reflecting long-term glycemic control. Reducing elevated HbA1c levels is a primary objective in diabetes management, as it is associated with a lower risk of complications. Additionally, diabetes significantly impacts an individual's quality of life, encompassing physical health, emotional well-being, and social

interactions. Evaluating the influence of educational interventions on both clinical markers like HbA1c and quality of life measures provides a holistic understanding of their impact on the well-being of individuals with diabetes.

This literature review has synthesized key findings from existing research on diabetes prevalence among women, the significance of beliefs and behaviors in diabetes management, the evolution of interactive educational approaches, and the clinical and quality of life implications of diabetes. It underscores the pressing need to investigate how interactive educational interventions can positively impact these facets of diabetes care among women. By synthesizing and building upon existing knowledge, the thesis aims to contribute to an improved understanding of effective strategies for enhancing the beliefs, behaviors, HbA1c levels, and overall quality of life of diabetic women, thereby advancing patient-centered approaches to diabetes management and ultimately improving health outcomes for this population.

2.2 Conceptual Framework:

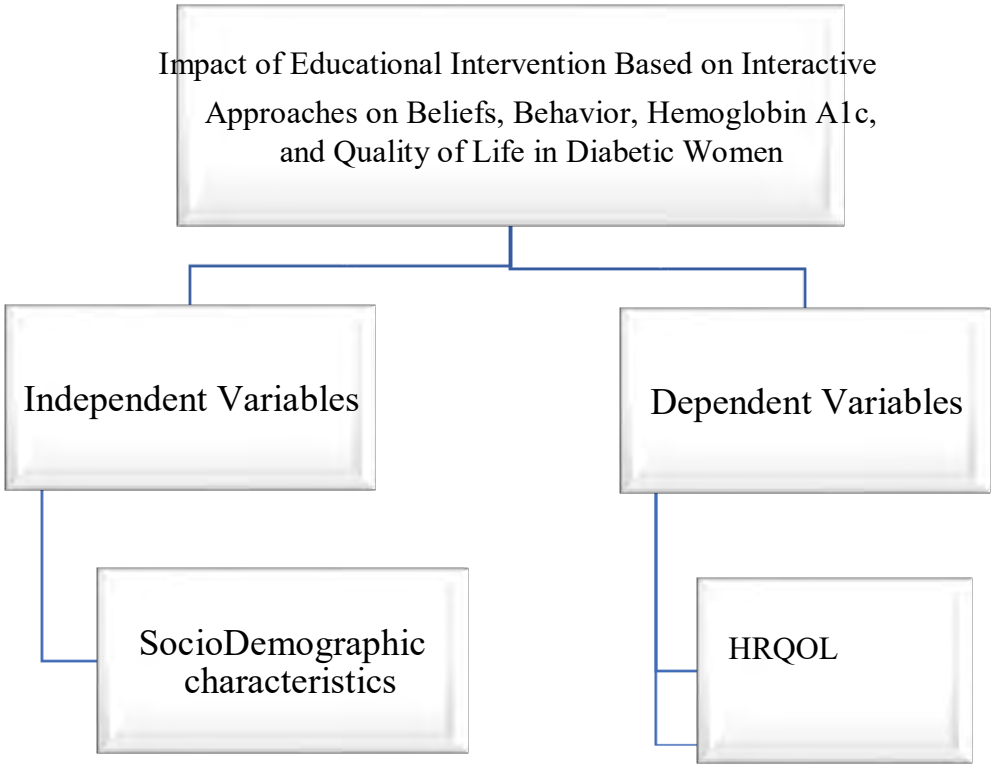

Figure 2: Conceptual Framework

2.3 Hypothesis:

2.3.1 Null hypothesis:

There is no significant Impact of Educational Intervention Based on Interactive Approaches on Beliefs, Behavior, Hemoglobin A1c, and Quality of Life in Diabetic Women Visiting THQ Hospital, Jhelum.

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2.3.2 Alternate hypothesis:

There is a significant difference between Impact of Educational Intervention Based on Interactive Approaches on Beliefs, Behavior, Hemoglobin A1c, and Quality of Life in Diabetic Women Visiting THQ Hospital, Jhelum.

2.4 Operational definitions:

2.4.1 Health-Related Quality of Life (HRQoL):

HRQoL is a multidimensional concept that quantifies an individual's overall well-being and functional status in relation to their health condition. It encompasses physical, emotional, mental, and social aspects of life and is typically assessed through standardized questionnaires or scales that measure a person's perceived health status, the impact of health on daily functioning, and their overall satisfaction with life in the context of their health. Higher scores indicate better HRQoL, while lower scores may signify poorer perceived health and well-being.

2.4.2 Type 2 Diabetes Mellitus (T2DM):

Type 2 Diabetes Mellitus (T2DM) is a chronic metabolic disorder characterized by persistent hyperglycemia (elevated blood glucose levels) resulting from a combination of insulin resistance, where the body's cells do not effectively respond to insulin, and relative insulin deficiency, where the pancreas does not produce enough insulin to maintain normal blood sugar levels. T2DM typically develops in adulthood, although it can occur in younger individuals, and is often associated with lifestyle factors such as obesity, physical inactivity, and poor dietary choices. Diagnosis is based on clinical criteria, including fasting blood glucose levels, oral glucose tolerance tests, or HbA1c measurements. The management of T2DM typically involves lifestyle modifications, oral medications, and, in some cases, insulin therapy, with the goal of achieving and maintaining glycemic control to prevent complications such as cardiovascular disease, neuropathy, and kidney damage

2.4.3 HbA1c (Hemoglobin A1c):

Operational Definition: HbA1c, also known as glycated hemoglobin, is a clinical marker used to assess long-term average blood glucose levels in individuals with diabetes mellitus. It is expressed as a percentage of hemoglobin that has become glycated due to exposure to elevated blood glucose over a span of approximately 2 to 3 months. HbA1c levels provide insights into an individual's glycemic control and the effectiveness of diabetes management. Lower HbA1c values generally indicate better blood sugar control and a reduced risk of diabetes-related complications.

2.4.4 Beliefs on Diabetes Mellitus:

Operational Definition: Beliefs on diabetes mellitus refer to an individual's cognitive constructs, attitudes, and convictions about their diabetes condition, its causes, management, and potential outcomes. These beliefs encompass both factual knowledge and subjective perceptions, including notions about the controllability of diabetes, self-efficacy in managing the condition, and perceived consequences of diabetes on one's life. Operationalizing beliefs often involves assessing them through structured questionnaires or interviews to gain insights into how individuals view and interpret their diabetes, which can influence their behaviors and treatment adherence.

2.4.5 Behaviors of Diabetic Patients:

Behaviors of diabetic patients refer to the observable actions, lifestyle choices, and self-care practices exhibited by individuals diagnosed with diabetes mellitus in managing their condition. These behaviors encompass a spectrum of actions, including but not limited to medication adherence, dietary choices, physical activity, self-monitoring of blood glucose levels, attendance at medical appointments, and engagement in health-promoting activities. The assessment of diabetic patient behaviors typically involves objective observations, self-reported data, or clinical records to evaluate the extent to which individuals are actively involved in self-management tasks and following prescribed treatment plans. Understanding and monitoring these behaviors are essential for assessing the effectiveness of diabetes management strategies and promoting improved health outcomes

CHAPTER 3: Methodology

3.1 Study Design:

A quasi experimental study was carried out to assess the Impact of Educational Intervention Based on Interactive Approaches on Beliefs, Behavior, Hemoglobin A1c, and Quality of Life in Diabetic Women visiting NCD Clinic of THQ Hospital, Jhelum.

3.2 Study Duration:

This study was carried out during a period of six months after the approval of the Institutional Review Board i.e from March to August 2023.

3.3 Study Setting:

NCD Clinic of THQ Hospital Sohawa ,Jhelum was selected for the study. Usiing stratified probability sampling technique. The study was conducted in this area. It is geographically situated on GT ROAD, JHELUM (Figure 1).

Figure 1: Map of Sohawa, Jhelum

3.4 Sample Selection:

3.4.1 Inclusion Criteria:

- Women with age above 18 years.
- Women who gave consent to participate in the study.
- Women with type 2 diabetes.
- Women who haven't taken any proper educational session.

3.4.2 Exclusion Criteria:

- Women with type 1 Diabetes.
- Women with Co Morbidities.
- Women with Gestational Diabetes.

3.5 Sample Size Calculation:

Sample size was calculated using Open Epi software. Calculated sample size was 240 as per previous study by Alireza D et al, 2021

3.6 Sampling Strategy:

By using stratified random sampling we distributed women into two equal groups one was interventional group and other was comparison group. Data was collected from the women with type 2 diabetes mellitus visiting NCD Department of THQ Sohawa, Jhelum.

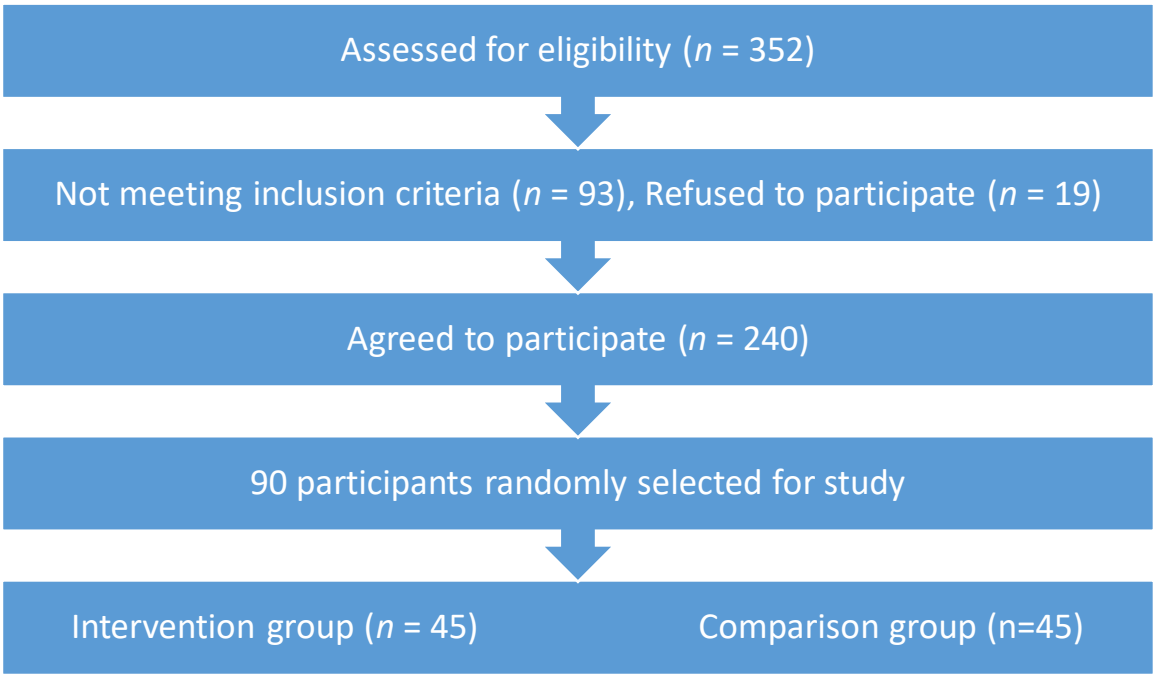

Figure: 5 Sampling Strategy

3.7 Data Collection Instrument:

Data was collected by using a validated and interview-based questionnaire. The WHOQOL-BREF is a 26-item instrument consisting of four domains: physical health (7 items), psychological health (6 items), social relationships (3 items), and environmental health (8 items); it also contains QOL and general health items. Each individual item of the WHOQOL-BREF is scored from 1 to 5 on a response scale, which is stipulated as a five-point ordinal scale.

3.8 Content of the Questionnaire:

The questionnaire contained four main domains:

1) First part include questions about physical health which contain (7 items).
2) Second part include psychological health which contain (6 items).
3) Third part include social relationships which contain (3 items).
4) Fourth part include environmental health which contain (8 items).
5) It also contains QOL and general health items.

3.9 Study Variables:

3.9.1 Outcome Variable:

The major construct of the questionnaire was to assess the Impact of Educational Intervention Based on Interactive Approaches on Beliefs, Behavior, Hemoglobin A1c, and Quality of Life in Diabetic Women

3.9.2 Independent Variables:

The Performa included socio-demographic variables such as age of women, level of education, occupation, ethnicity, marital status, monthly household income, number of children, social relationships.

3.10 Data Collection:

Data was collected using a validated and interview-based questionnaire. The WHOQOL-BREF tool was adapted for this study. WHOQOL-BREF is a tool designed to assess the Impact of Educational Intervention Based on Interactive Approaches on Beliefs, Behavior, Hemoglobin A1c, and Quality of Life in Diabetic Women. It includes questions that ask the importance of physical health, psychological health, social relationships and environmental health. Women visiting NCD Clinic of THQ Sohawa, Jhelum were approached for data collection. Consent was taken orally from all the participants and only those participants were selected who agreed to take part in the research process and fulfill the inclusion criteria. After taking informed consent, the participants were interviewed and their responses were recorded by the researcher on the proforma.

3.11 Data Analysis:

To analyze the data, we applied descriptive statistics such as frequencies, percentages for qualitative variables. With regard to the normal distribution of data, the independent t-test and dependent t-test were utilized to compare the means of two independent groups and two related groups. SPSS software version 26 was utilized for data analysis. $P < 0.05$ was considered as significant in all tests.

3.12 Ethical Considerations:

Before starting formal data collection, approval from Institutional Review Board (IRB) of Al-Shifa School of Public Health Rawalpindi, Pakistan was taken (Annexure-I). Permission letter from the Head of Department of AlShifa School of Public Health was obtained. Individuals were explained the purpose of the research and oral consent was taken from each participant (Annexure-3). Participants were assured for the confidentiality of their data. Data collected from the respondents was kept anonymous and was not shared with anyone. Data was entered in SPSS anonymously.

Chapter IV: Results

4.1 Descriptive Results

Table 1 shows the frequency of characteristics and mean ± standard deviation of study main variables in two groups before education. There is no significant difference between the two groups in all of the variables.

More women found in age group of (44-56) , 21(46.7) were in intervention group and 20(44.4) were in comparison group. Illiteracy was found more in women and illiteracy rate was 21(46.7) in intervention group and 23(51.1) in comparison group. Overall Monthly income was weak with 22(48.9) in intervention group and 23(51.1) was found in comparison group.

Table 1: Distribution of study variables in two groups

Variables	Intervention group (n=45)	Comparison group(n=45)
Age group (years) (n, %)		
18-30	0 (0)	1 (2.2)
31-43	10 (22.2)	11 (24.4)
44-56	21 (46.7)	20 (44.4)
>56	14 (31.1)	13 (28.9)
Education (n, %)		
Illiterate	21 (46.7)	23 (51.1)
Primary	11 (24.4)	10 (22.2)
Secondary	6 (13.3)	6 (13.3)
Tertiary	5 (11.1)	4 (8.9)
University	2 (4.4)	2 (4.4)
Monthly income (n, %)		
Weak	22 (48.9)	23 (51.1)
Fairly moderate	13 (28.9)	12 (26.7)

Moderate	5 (11.1)	6 (13.3)
Good	5 (11.1)	4 (8.9)
Information source (n, %)		
Health personnel	34 (75.5)	32 (71.1)
Others	11 (24.4)	13 (28.9)
Visit interval by physician (n, %)		
≤2 months	26 (57.8)	24 (53.3)
>2 months	19 (42.2)	21 (46.7)
Treatment routes (n, %)		
Insulin	8 (17.8)	9 (20)
Oral drugs	30 (66.7)	31 (68.9)
Both insulin and oral drugs	5 (11.1)	4 (8.9)
None	2 (4.4)	1 (2.2)
Health beliefs (mean±SD)		
Attitude	64.5±15.3	65±15.7
Self-efficacy	40.4±5	42.5±4.6
Self-care behavior	2.4±5	2.5±0.91
HbA1c (mean±SD)	9.42±1.91	9.75±1.95
HRQOL (mean±SD)		
Physical health	45.71±15.72	45.55±17.95
Psychological health	49.55±12.1	51.48±13.7
Social health	55.2±17	57.6±18
Environment	54.4±7.03	56.6±6.33
Overall HRQOL	50.7±18.4	52.8±18.3

Duration of diabetes (years)	8.12±6.21	7.98±5.56
Body mass index	28.7±4.5	29.01±4.7
Knowledge	7.28±3.45	7.1±2.9

4.2 Inferential Results:

Table 2 indicates the status of the mean scores of the studied psychosocial variables in the two groups before and 3 months after education. After education, the intervention group had statistically significant increase in the mean score of knowledge ($P < 0.001$), attitude ($P < 0.001$), self-efficacy ($P < 0.001$), and behavior ($P < 0.001$).

Table 2: Comparison of the mean±standard deviation scores of variable of knowledge, beliefs, and behavior in participants before and after education in two study groups

Variable	Intervention group (*n*=45)			Comparison group (*n*=45)			*P* value of between groups[b]
	Before education	3 months after education	*P*[a]	Before education	3 months after education	*P*[a]	
Knowledge	7.28±3.45	11.24±2.18	<0.001*	7.1±2.9	6.9±2.8	0.76	<0.001*
Belief							
Attitude	64.5±15.3	120.5±14.1	<0.001*	65±15.7	66±16.3	0.185	<0.001*
Self-efficacy	40.4±5	68.6±3.4	<0.001*	42.5±4.6	43. ±5.7	0.115	<0.001*
Behavior	2.4±0.63	4.3±0.56	<0.001*	2.5±0.91	2.4±0.9	0.531	<0.001*

Independent *t*- and paired *t*-tests were used for comparing means, *P<0.01 is significant (two-tailed). [a]P value of within groups, [b]P value of between groups

Table 3 shows effects of educational intervention on the other study variables in the two groups before and 3 months after education. After educational program, the intervention group had statistically significant increase in the mean score of physical health ($P < 0.001$), psychological health ($P < 0.001$), social health ($P < 0.001$), and total HRQOL ($P < 0.001$). Although mean of environment score improved from 54.4 to 56.8, the paired t-test was not statistically significant. Furthermore, intervention group had statistically significant reduction in the mean of HbA1c from 9.42 to 7.81 ($P < 0.001$). Patients in the control group showed no significant changes in the outcomes measured ($P > 0.05$).

Table 3: Comparison of the mean±standard deviation scores of variable of hemoglobin A1c level and quality of life in participants before and after education in two study groups

Variable	Intervention group (*n*=45)			Comparison group (*n*=45)			*P* value of between groups[b]
	Before education	3 months after education	*P*[a]	Before education	3 months after education	*P*[a]	
HbA1c	9.42±1.91	7.81±1.26	<0.001*	9.75±1.95	10.26±1.73	0.42	<0.001*
HRQOL							
Physical health	45.71±15.72	66.58±6.51	<0.001*	45.55±17.95	44.92±17.43	0.95	<0.001*
Psychological	49.55±12.1	68.87±6.2	<0.001*	51.48±13.7	50.37±12.8	0.16	<0.001*
Social	55.2±17	70.5±7.6	<0.001*	57.6±18	56.3±16.7	0.52	<0.001*
Environment	54.4±7.03	56.8±7.3	0.123	56.6±6.33	54.1±5.9	0.12	<0.001*
Total HRQOL	50.7±18.4	64.1±11.1	<0.001*	52.8±18.3	51.1±16	0.123 0.32	0.123 <0.001*

Independent *t*- and paired *t*-tests were used for comparing means, **P*<0.01 is significant (two-tailed). [a]*P* value of within groups, [b]*P* value of between groups. HRQOL=Health-related quality of life, HbA1c=Hemoglobin A1c level

Chapter V: Discussion

Discussion:

Increases knowledge, health beliefs, behavior, and improves HbA1c and HRQOL. It seems that improvement in HbA1c and HRQOL of diabetics is dependent on behavior change and also behavior modification might be related to the change that educational intervention made in participants' knowledge, attitudes, and self-efficacy. Lack of awareness has been identified as one of the reasons why patients do not control their disease.

The type of education that can improve patient's self-care is known to be the first step in controlling diabetes. As in the current study, mean score of knowledge level in women with DM increased in intervention group after education and paired t-test confirmed the significant difference. In contrast, this variable was not changed in the comparison group at the end of the study. This finding was supported by other studies results. For instance, results of study of Hartayu et al. showed that group-based interactive approach increased knowledge level of diabetic patients in intervention group after education. They concluded interactive strategy is effective to improve diabetic patients' knowledge. Furthermore, other studies have confirmed that this instructional approach (interactive approach) is effective in improving knowledge of participants and these studies supposed increased of patients' knowledge will be more, if they involve in educational process.

Although knowledge level of diabetics plays the important role in managing and controlling their condition, but it is not sufficient. To better manage and control diabetes, other effective factors such as attitude and self-efficacy of diabetic patients should also be considered. Attitudes and self-efficacies of diabetics are more effective than knowledge in improving metabolic control.

The results showed statistically significant differences in attitude mean score of the intervention group after the educational intervention, which is consistent with previous studies. It seems that attitude also is influential on self-care activities and glycemic control. To raise intention to engage in self-care of diabetics, it is necessary that patients gain a positive attitude toward self-care behaviors. One study also proved that a relationship existed between diabetes-specific health beliefs and following a diabetes regimen and controlling glucose among older people with noninsulin-dependent DM. Self-efficacy, as another psychosocial factor, can play the main role in changing behavior, and then diabetes educators, practitioners,

and consultants should consider to this subject. This study finding indicated the mean score of self-efficacy increased after education and paired t-test confirmed it. Results of previous studies are consistent with our finding

In an experimental study and in accordance with self-efficacy theory in physical activity improvement, Allen examined the effect of education among the patients with type 2 diabetes. It was found that a significant difference existed between self-efficacy averages of the experimental and control groups before and after the intervention (8 weeks later). The findings of our study were consistent with those of Henrietta's. In Henrietta's study, it was found that there was a positive correlation between self-efficacy and diabetes activities. This indicated that individuals with higher self-efficacy performed more diabetes self-care activities.
The study conducted by Whittemore et al. confirmed that in women with type 2 diabetes, positive health outcomes may be led by their perceived self-confidence and support. Findings of Gumbs's study also showed that those women receiving DSME were significantly more likely to check their own blood sugar and feet on a regular basis, to perform moderate physical activities, and to have received foot examination, glycosylated hemoglobin measurements, and dilated eye examinations by healthcare providers over the past year. The impact of education on self-care behavior, as a final short-term objective, was also assessed in this interventional study.

The results showed that the patients' mean of performance in intervention group has improved after the intervention. Paired t-test showed that the mean of self-care behavior scores in intervention group is different, but not in the control group. It means that education using interactive training methods is effective on behavior of diabetic patients. Results of Kroese's et al. study were consistent with our findings. As he and his colleagues found that educational had a positive effect on the improvement of cognitive skills, self-care activities, and also dietary and exercise behaviors. Others have also resulted in significant improvements in diabetes outcomes. For instance, Deakin et al. concluded that in patients with type 2 DM, group-based education in self- management strategies improves clinical and lifestyle outcomes. The results indicated that a significant difference existed between HbA1c levels before and after the intervention in the experimental group and not in the control group. These findings of the study are consistent with those of other studies. Reduction of HbA1c is mainly a consequence of changes in the behavior of the intervention group members. During the 6–8 weeks of education period, the average of patients' blood glucose levels was closer to normal. In addition, the long-term risk of complications was reduced. Maintenance of HbA1c low

levels will prevent complications associated with diabetes. A 1% decrease in HbA1c causes a 21% reduction in mortality associated with diabetes, a 14% decrease in Improving the QOL for patients with diabetes in a way that they can lead as normal a life as possible is one of the main objectives of diabetes management. It is an important measure of outcome that should be examined on a routine basis in clinical trials which are concerned with evaluating patients' education. This study showed that before diabetes education, patients with diabetes had a lower overall HRQOL in all aspects. Health education led to higher scores in all dimensions except for the environment in intervention group. In case, these changes were not observed in the control group. The results of this study are consistent with those observations made by other studies which have found that diabetes education contributes to an increase in the HRQOL score. Furthermore, there is ample evidence from different interventional studies for the positive impact of educational programs on various aspects of QOL and overall well-being. The study has several strengths. First, the educational intervention was pragmatically designed for implementation in a primary care setting for patients. Second, Basic principles relating to interactive educational techniques fully considered in educational meetings. Finally, we measured long-term outcomes of education in addition to its short-term outcomes. Shortage of follow-up period y, small sample size, and losing samples within the study process were the study limitations. Therefore, increased educational follow-up periods, and using big sample size were recommended for researchers who will conduct educational studies. Myocardial infarction, and a 37% decrease in microvascular complications are demonstrated by research studies.

Improving the QOL for patients with diabetes in a way that they can lead as normal a life as possible is one of the main objectives of diabetes management. It is an important measure of outcome that should be examined on a routine basis in clinical trials which are concerned with evaluating patients' education. This study showed that before diabetes education, patients with diabetes had a lower overall HRQOL in all aspects. Health education led to higher scores in all dimensions except for the environment in intervention group. In case, these changes were not observed in the control group. The results of this study are consistent with those observations made by other studies which have found that diabetes education contributes to an increase in the HRQOL score. Furthermore, there is ample evidence from different interventional studies for the positive impact of educational programs on various aspects of QOL and overall well-being. The study has several strengths. First, the educational intervention was pragmatically designed for implementation in a primary care setting for patients. Second, Basic principles relating to interactive educational techniques fully

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Chapter VI: Conclusion, Strengths and Limitations

Conclusion:

Results highlighted that applying interactive and collaborative educational approaches in educating women with diabetes 2 were important, helpful, and valuable. After education, ample changes have been seen in areas of patients' health beliefs, behavior, glycemic control index, and QOL. The study suggests that practitioners, nurses, and other health care providers should consider interactive education as a core element in delivering health care to diabetic patients.

Hence, educational interventions should be designed in a way that they put the focus on individual needs of each patient, that is, a patient-centered approach is needed. In designing an educational program, factors such as the patient's priorities, feelings, expectations, and lifestyle changes following the disease should also be taken into account. In addition, patients with type 2 diabetes should receive ongoing education. The reason behind this is that over time knowledge tends to be lost and as a consequence maintaining the beneficial effects of the intervention will become more difficult.

Strengths:

- Limited research is present in Jhelum, Pakistan regarding the Impact of Educational Intervention Based on Interactive Approaches on Beliefs, Behavior, Hemoglobin A1c, and Quality of Life in Diabetic Women.
- This study may contribute to filling gaps in existing literature about Impact of Educational Intervention Based on Interactive Approaches on Beliefs, Behavior, Hemoglobin A1c, and Quality of Life in Diabetic Women.
- A validated tool was used for this study and the study was conducted using well-structured questionnaire. This minimizes potential bias and ensures that the responses are reliable indicators of the participant`s perspectives.

- This study explored a range of variables to help the researcher identify potential correlations between socio-demographic characteristics and HRQOL.

Limitations:.

- The findings may not be representative of the broader population as it was conducted in Tehsel Sohawa , Jhelum so it may be challenging to generalize the results to individuals from different social, economic and educational backgrounds.
- Due to significant regional and contextual variations in factors, findings from one population cannot always be generalized or Extrapolated to another.

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ANNEURE I

IRB letter

AL-SHIFA SCHOOL OF PUBLIC HEALTH
PAKISTAN INSTITUTE OF OPHTHALMOLOGY
AL-SHIFA TRUST, RAWALPINDI

MSPH-IRB/15-14
27st Mar, 2023

TO WHOM IT MAY CONCERN

This is to certify that **Anum Anwar** D/O **Muhammad Anwar** is a student of Master of Science in Public Health (MSPH) final semester at Al-Shifa School of Public Health, PIO, Al-Shifa Trust Rawalpindi. He/she has to conduct a research project as part of curriculum & compulsory requirement for the award of degree by the Quaid-i-Azam University, Islamabad. His/her research topic, which has already been approved by the Institutional Review Board (IRB), is **"Impact of educational intervention based on interactive approaches on Beliefs, Behaviors, Hemoglobin A1c and quality of life in diabetic women visiting the hospital Jhelum".**

Please provide his/her necessary help and support in completion of the research project. Thank you.

Sincerely,

Dr. Ayesha Babar Kawish
Head
Al-Shifa School of Public Health, PIO
Al-Shifa Trust, Rawalpindi

AL-SHIFA TRUST, JEHLUM ROAD, RAWALPINDI – PAKISTAN
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ANNEXURE II:

Gantt Chart

ACTIVITIES	March 2023	Apri L 2023	May 2023	June 2023	July 2023	August 2023
Topic Selection Literature Search						
Synopsis and IRB approval						
Data Collection						
Data Analysis						
Thesis Writeup						
Thesis submission and Thesis Defense						

ANNEXURE III

Proposed Budget

Budget item	Transport	Stationery and Internet	Printing	HbA1c Test cost
Data Collection	8,000 Rs/-	5,000 Rs/-	-	
Thesis write-up	5,000 Rs/-	5,000 Rs/-	10,000 Rs/-	
Total Expenditure	23,000 Rs/-	15,000 Rs/-	15,000 Rs/-	60,000 Rs/-
Grand Total	113,000 Rs/-			

ANNEXURE IV

Informed Consent Form

Title :

Impact of Educational Intervention Based on Interactive Approaches on Beliefs, Behavior, Hemoglobin A1c, and Quality of Life in Diabetic Women Visiting THQ Hospital, Jhelum of study.

.

Principal investigator:

Anum Anwar

MSPH student, Al-Shifa School of public health Rawalpindi.

Purpose of this study:

This study explores the critical need to assess the effectiveness of interactive educational interventions in improving the beliefs, behaviors, and overall health outcomes of diabetic women. With rising diabetes prevalence and unique challenges faced by women in diabetes management, understanding how interactive education influences HbA1c levels and quality of life is imperative. This research fills a knowledge gap, offering insights that can enhance the care and well-being of diabetic women and inform more patient-centric approaches to diabetes management.

Subject participation:

Your participation will help the researcher to assess the Impact of Educational Intervention Based on Interactive Approaches on Beliefs, Behavior, Hemoglobin A1c, and Quality of Life in Diabetic Women.

Procedure:

Data will be collected from diabetic women by using a questionnaire to collect demographic information and to assess the Impact of Educational Intervention Based on Interactive Approaches on Beliefs, Behavior, Hemoglobin A1c, and Quality of Life.

Time required:

It is anticipated that it will take approximately 15 to 20 minutes to complete the questionnaires.

Voluntary participation:

Your participation in this study is voluntary.

Right to Withdraw:

After you sign the consent form, you are still free to withdraw at any time and without giving a reason.

Confidentiality:

Data will be completely anonymous and reported in aggregate form.

Risks:

There are no significant risks associated with this study.

Benefits:

There are no direct benefits associated with participation in this study

Payment:

You will receive no payment for participating in the study.

Contact information:

If you have questions about the study, please contact the following individual:

Anum Anwar

abc@gmail.com

0324-1234567 Consent:

I have read and I understand the provided information and have had the opportunity to ask questions. I understand that my participation is voluntary and

that I am free to withdraw at any time, without giving a reason and without cost. I understand that I will be given a copy of this consent form. I voluntarily agree to take part in this study.

Name of Participant_____

Signature of Participant _____

Date _____(DD/MM/YY)

Statement by the researcher/person taking consent:

I have accurately read out the information sheet to the potential participant, and to the best of my ability made sure that the participant understands that. I confirm that the participant was given an opportunity to ask questions about the study, and all the questions asked by the participant have been answered correctly and to the best of my ability. I confirm that the individual has not been coerced into giving consent, and the consent has been given freely and voluntarily. A copy of this Informed Consent Form (ICF) has been provided to the participant.

Name of Researcher/person taking the consent _____

Signature of Researcher /person taking the consent_ _____

Date _____(DD/MM/YY)

Annexure V:

Questionnaire

WHOQOL-BREF

Field Trial Version
December 1996

PROGRAMME ON MENTAL HEALTH
WORLD HEALTH ORGANIZATION
GENEVA

For office use only

	Equations for computing domain scores	Raw score	Transformed scores*	
			4-20	0-100
Domain 1	(6-Q3) + (6-Q4) + Q10 + Q15 + Q16 + Q17 + Q18 ☐ + ☐ + ☐ + ☐ + ☐ + ☐ + ☐	=		
Domain 2	Q5 + Q6 + Q7 + Q11 + Q19 + (6-Q26) ☐ + ☐ + ☐ + ☐ + ☐ + ☐	=		
Domain 3	Q20 + Q21 + Q22 ☐ + ☐ + ☐	=		
Domain 4	Q8 + Q9 + Q12 + Q13 + Q14 + Q23 + Q24 + Q25 ☐ + ☐ + ☐ + ☐ + ☐ + ☐ + ☐ + ☐	=		

* Please see Table 4 on page 10 of the manual, for converting raw scores to transformed scores.

I.D. number

ABOUT YOU

Before you begin we would like to ask you to answer a few general questions about yourself: by circling the correct answer or by filling in the space provided.

What is your **gender?** Male Female

What is you **date of birth?** _____ / _____ / _____
Day / Month / Year

What is the highest **education** you received?
None at all
Primary school
Secondary school
Tertiary

What is your **marital status?**
Single Separated
Married Divorced
Living as married Widowed

Are you currently **ill?** Yes No

If something is wrong with your health what do you think it is?_____illness/ problem

Instructions

This assessment asks how you feel about your quality of life, health, or other areas of your life. **Please answer all the questions.** If you are unsure about which response to give to a question, **please choose the one** that appears most appropriate. This can often be your first response.

Please keep in mind your standards, hopes, pleasures and concerns. We ask that you think about your life **in the last two weeks.** For example, thinking about the last two weeks, a question might ask:

		Not at all	Not much	Moderately	A great deal	Completely
	Do you get the kind of support from others that you need?	1	2	3	4	5

You should circle the number that best fits how much support you got from others over the last two weeks. So you would circle the number 4 if you got a great deal of support from others as follows.

		Not at all	Not much	Moderately	A great deal	Completely
	Do you get the kind of support from others that you need?	1	2	3	(4)	5

You would circle number 1 if you did not get any of the support that you needed from others in the last two weeks.

Please read each question, assess your feelings, and circle the number on the scale for each question that gives the best answer for you.

		Very poor	Poor	Neither poor nor good	Good	Very good
1(G1)	How would you rate your quality of life?	1	2	3	4	5

		Very dissatisfied	Dissatisfied	Neither satisfied nor dissatisfied	Satisfied	Very satisfied
2 (G4)	How satisfied are you with your health?	1	2	3	4	5

The following questions ask about **how much** you have experienced certain things in the last two weeks.

		Not at all	A little	A moderate amount	Very much	An extreme amount
3 (F1.4)	To what extent do you feel that physical pain prevents you from doing what you need to do?	1	2	3	4	5
4(F11.3)	How much do you need any medical treatment to function in your daily life?	1	2	3	4	5
5(F4.1)	How much do you enjoy life?	1	2	3	4	5
6(F24.2)	To what extent do you feel your life to be meaningful?	1	2	3	4	5

		Not at all	A little	A moderate amount	Very much	Extremely
7(F5.3)	How well are you able to concentrate?	1	2	3	4	5
8 (F16.1)	How safe do you feel in your daily life?	1	2	3	4	5
9 (F22.1)	How healthy is your physical environment?	1	2	3	4	5

The following questions ask about **how completely** you experience or were able to do certain things in the last two weeks.

		Not at all	A little	Moderately	Mostly	Completely
10 (F2.1)	Do you have enough energy for everyday life?	1	2	3	4	5
11 (F7.1)	Are you able to accept your bodily appearance?	1	2	3	4	5
12 (F18.1)	Have you enough money to meet your needs?	1	2	3	4	5
13 (F20.1)	How available to you is the information that you need in your day-to-day life?	1	2	3	4	5
14 (F21.1)	To what extent do you have the opportunity for leisure activities?	1	2	3	4	5

		Very poor	Poor	Neither poor nor good	Good	Very good
15 (F9.1)	How well are you able to get around?	1	2	3	4	5

The following questions ask you to say how **good or satisfied** you have felt about various aspects of your life over the last two weeks.

		Very dissatisfied	Dissatisfied	Neither satisfied nor dissatisfied	Satisfied	Very satisfied
16 (F3.3)	How satisfied are you with your sleep?	1	2	3	4	5
17 (F10.3)	How satisfied are you with your ability to perform your daily living activities?	1	2	3	4	5
18(F12.4)	How satisfied are you with your capacity for work?	1	2	3	4	5
19 (F6.3)	How satisfied are you with yourself?	1	2	3	4	5
20(F13.3)	How satisfied are you with your personal relationships?	1	2	3	4	5
21(F15.3)	How satisfied are you with your sex life?	1	2	3	4	5
22(F14.4)	How satisfied are you with the support you get from your friends?	1	2	3	4	5
23(F17.3)	How satisfied are you with the conditions of your living place?	1	2	3	4	5
24(F19.3)	How satisfied are you with your access to health services?	1	2	3	4	5
25(F23.3)	How satisfied are you with your transport?	1	2	3	4	5

The following question refers to **how often** you have felt or experienced certain things in the last two weeks.

		Never	Seldom	Quite often	Very often	Always
26 (F8.1)	How often do you have negative feelings such as blue mood, despair, anxiety, depression?	1	2	3	4	5

Did someone help you to fill out this form?.....

How long did it take to fill this form out?.....

Do you have any comments about the assessment?

.....

.....

THANK YOU FOR YOUR HELP

m\..misce\whoqol\bref