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The Effect of an Educational Program on the Quality of Life of Patients with Vitiligo

[1]Ward Moustafa Ahmed, [2]Mai Ashraf Hosni, [3]Baghdad Hussien Mahmoud, [4]Zienab Hussien Ali

[1]Director at technical nursing school of fayoum

[2]Lecturer of Dermatology and STDs Faculty of Medicine, Fayoum University

[3]Assistant Professor of Medical Surgical Nursing Faculty of Nursing, Helwan University

[4]Professor of Medical Surgical Nursing, Faculty of Nursing, Helwan University

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Abstract: **Quality of life is regarded as a primary aim in vitiligo management, approaching quality of life of patients through an educational program is fundamental and active involvement of patients in their management is an essential component to the overall improvement of their quality of life. The aim: This study aimed to evaluate the effect of an educational program on quality of life for patients with Vitiligo. Design: Aquasi- experimental research design was utilized. Setting: the study was conducted at the Dermatology Outpatient clinic in Fayoum University Hospitals. Samples: A purposive sample of 50 adult patients from both genders diagnosed with Vitiligo Tools: Three tools were utilized for data collection Tool (I): Structured interview questionnaire, Tool (II) Knowledge assessment questionnaire and Tool (III): assessment questionnaire on quality of life for patients' with vitiligo. Results: 40% of studied patient aged from 30-40 years. There were high statistically significant differences of patients' knowledge and quality of life domains as physical, Nutritional, psychological, spiritual-assessment and social domains with P value (0.001) in comparison to preprogram implementation. There were high statistically significant positive correlations between quality of life and knowledge scores during immediate post and follow up phases (P= 0.001). Conclusions: There was an improvement of patients' level of knowledge regarding care of their disease which leads to improvement of patients' quality of life. Recommendations: The developed educational programme should be implemented on a wider scale and evaluated for further improvement.**

Keywords: **Educational program, Quality of life and Vitiligo.**

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1. INTRODUCTION

The skin is the largest organ of the human body, accounting for 15 % of the total body weight. It forms a natural barrier between the body and the outside world, protects against injuries and provides the first line of defence to external chemical, physical and microbial threats. The skin also has important homeostatic functions such as reducing water loss and contributing to thermoregulation of the body. Its integrity is accomplished by a complex supra structural network of proteins that attach the outermost epidermal layer to the underlying dermis. Any manifestation in skin It creates cosmetic problem and disturbs a patient's personal, physical, familial, and social life **(Piñón-Hofbauer,et al.,2024)**

Melanin serves as the pigment for skin color, hair follicles and mucous membranes that primary determines skin, hair, and eye color. Vitiligo is characterized by the appearance of white spots on the skin and is a chronic pigmentation disorder that occurs as a result of the absence of melanocytes and the impaired functioning of melanocytes in the human skin.. Throughout the years, several theories have emerged to explain its causes, including the immune system theory, nerve fluid theory, and melanin self-destruct theory. Unfortunately, there is currently no known cure for this condition **(Saleh,etal., 2020 & AL-smadi etal., 2023)** Managing vitiligo necessitates long-term care and adherence to specific lifestyle patterns **(Bergqvist & Ezzedine., 2021)**

Clinically, vitiligo can manifest in three distinct forms: segmental, non-segmental, and mixed/unclassified. Non-segmental vitiligo (NSV) is the most common type, accounting for 80–90% of all cases. NSV presents as chronic depigmented white patches on the skin and hair follicles that are often bilateral, symmetric, and tend to enlarge and spread over time **(Luo, et al., 2020)**. There are many subtypes encompasses at NSV, including focal, mucosal, generalized, universal, and mixed forms. Focal presents as a single patch, no segmental distribution, stable for two years or more, potentially indicating generalized vitiligo. Mucosal vitiligo multiple mucosal sites like oral cavity, buccal mucosa, and vagina. Acrofacial vitiligo predominantly involves patches on face, extremities, fingers, and periorbital regions **(AL-smadi, et al., 2023).**

Vitiligo symptoms can be categorized into local, systemic, and combined manifestations. While this condition can occur at any age, it typically emerges between 10 and 30 years old. The initial skin lesions of vitiligo present as depigmented circles or irregular shapes of varying sizes. Occasionally, these patches may exhibit erythematous boundaries, accompanied by pruritus, pain, and inflammation along the advancing edge. In some cases, vitiligo patients may experience associated eye and inner ear disorders. Furthermore, individuals with vitiligo frequently develop autoimmune thyroid disease and other autoimmune conditions. The presence of systemic diseases, such as diabetes, pernicious anemia, hypothyroidism, hyperthyroidism, and liver diseases, may also coincide with vitiligo **(Murshidi, et al., 2023)**

Patients' knowledge about their illness is based on information received from different sources, including their physician, nurses, family, friends, as well as existing social and cultural notions about health and illness. The resulting beliefs can be flawed or inaccurate. These beliefs have a direct impact on the ability of patients to cope with the condition and to comply with the treatment **(Taylor et al., 2024).** a study from Iran showed that the knowledge of 80 vitiligo patients regarding the causes and course of their disease was limited. It is important to understand the beliefs vitiligo patients 'hold regarding their illness. To our knowledge, there have been very few studies worldwide regarding vitiligo patients' beliefs about their condition. Moreover, there has been no such study performed in Arab vitiligo patients**(Elsayed Amin, et al., 2024).**

Quality of life (QOL) is a broad concept that incorporates all aspects of life and has been used in a variety of disciplines such as: geography, philosophy, medical sciences, social sciences, health promotion, and advertising. The World Health Organization (WHO) defined quality of life as "an individual's perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns. It is a broad ranging concept affected in a complex way by the person's physical health, psychological state, personal beliefs, social relationships and their relationship to salient features of their environment **(Yadav & Gupta, 2021)**.

Nurses play a great role in caring of vitiligo patient. So, improving patient knowledge and practice is a vital including, patient education about the disease, nutrition and clinical diet; and regarding practices as physical and activity management, exercises that increase immunity and improve patient quality of life and prevent complications like pruritus (itching) **(Potter et al., 2021).**

Significance of the study

Misconceptions about vitiligo seem to be higher than previous reports. This may be due to the visualized based questionnaires instead of asking from the word 'vitiligo' directly. Therefore, educational knowledge about disease recognition, causes and mode of transmission should be encouraged for public **(Ebrahim, et al., 2023).**

Vitiligo represents a global health concern, with estimated prevalence rates ranging from 0.1% to 8% of population, with approximately 100 million affected worldwide. In regions like the United States and Europe, the prevalence is 1%. However, in Egypt, the incidence of vitiligo is notably, ranging from 1.25% to 6% of total population. It's noteworthy that vitiligo manifests before age of 20 in 50% of patients, affecting both sexes equally **(Abd-El Mohsen & Mohamed, 2020; Khatab et al.,2021).**

Furthermore, vitiligo frequently exerts a significantly negative impact on social, psychological, physical of patients' lives vitiligo patients experience feelings of embarrassment, leading to low self-esteem, social isolation and stigmatization. Consequently, patients may exhibit poor adherence to medical care, and occupational discrimination. and harboring misconceptions about contagion Therefore, nurses assume a crucial role in assessing, planning, and implementing tailored care for each vitiligo patient. Future research should focus on developing standardized rating tools to aid nurses in assessing the personal impact of vitiligo on patients' lives **(Khatab, et al.,2021).** As no studies on vitiligo have been conducted in fayoum City, there is a need for a study to assess vitiligo patients and its associated factors in this area.

Nurses have a significant impact on the care and support provided to individuals with vitiligo. So improving patient's knowledge and practice is a vital. Improving health care provided for patients with vitiligo had become a priority objective of achieving a high degree of patient satisfaction through greater awareness among the patients, increasing demand for better care, keener competition, more health care regulation, improving patient and disease outcomes and preventing complications **(Murshidi et al., 2023).** So the aim of this study was evaluate the effect of an educational program on quality of life of patients with vitiligo.

Aim of the study

The study aimed to evaluate the effect of an educational program on the quality of life of patients with vitiligo through the following objectives:-

Assess quality of life needs for patient's with vitiligo.

1- Design an Educational Program for patient's with vitiligo based on their assessment needs.

2- Implement the designated educational program for patients with vitiligo.

3- Evaluate the effect of the provided program on the studied patient's quality of life.

Research Questions

Research Question 1: What is the effect of the provided educational program on the patient's with vitiligo on their social status.

Research Question 2: What is the effect of the provided educational program on the patient's with vitiligo on their psychological status.

Research Question 3: What is the effect of the provided educational program on the patient's with vitiligo on their physical status.

Research Question 4: What is the effect of the provided educational program on the patient's with vitiligo on their nutritional status.

Research Hypothesis

To fulfill the aim of the study the following research hypothesis will be studied:

H: Quality of life of Patients with vitiligo will be improved after the implementation of educational Program than before as measured by tool II.

2. SUBJECTS AND METHODS

The subjects and methods for this study was portrayed according to the four main designs as follows:

I- Technical designs.

II- Operational designs.

III- Administrative designs.

IV- Statistical designs.

I- Technical designs:

The technical designs for the present study included the following: research design, setting, subjects and tools for data collection.

I-1 Research design*:* A quasi –experimental research design with one group (Pre/Post-test) approach was utilized to conduct this study.

I-2 Setting:

The present study conducted at the Dermatology Outpatient clinic in Fayoum University Hospitals. It receives patients from all areas of Fayoum governorate The Dermatology Outpatient clinic consists of 3 sections; the first sections consists of physician office, the second sections is an examination room and dermal cauterization, the third sections consists of ultraviolet light therapy

I-3 Subjects:

purposive sample of 50 adult patients from both genders clinically diagnosed with vitiligo. The patients were selected according to following criteria:

Inclusion criteria

- Diagnosed as vitiligo patients. –

- Patients willing to participate in the study

Exclusion criteria

- Patients with depigmentation caused by chemicals, burns or other diseases

- Children (<18years).

Sample size: the were include (50) patients clinically diagnosed with vitiligo.

I-4 Tools for data collection:

Two tools were used to collect the data according to the following:

Tool I: **Vitiligo Patientes' assessment questionnaire:**

This tool were adapted from ***Oguz et al.,(2016)***. Consists of the following two parts that were fuifilled by the researcher, **its includes**:

Part I: Patient personal Characteristics

This part were include personal characteristics of patient as; age, gender, educational level, occupation, marital status, residence, economical status and duration of diagnosis of the disease.

Part II: Patients knowledge questionnaire about vitiligo:

Patient's knowledge about vitiligo. It were include definition of vitiligo, melanocytes, types of vitiligo, causes, classifications, clinical manifestations, diagnosis, knowledge related to treatment of vitiligo it consists of 9 items, knowledge related to healthy eating consists of 9 items knowledge related to psychological and social problems consists of 7 items.

Scoring system: Patient knowledge assessment questionnaire consist of 34 questions, the correct answer was scored 2 point, incomplete correct 1 point and incorrect 0 point, and satisfactory level was detected based on statistical analysis as following:

Satisfactory knowledge level ≥ 70%

Unsatisfactory knowledge level < 70%

Tool (II): -Pre/Post assessment questionnaire on quality of life for patients' with vitiligo:

This tool identified a way of living or the manner in which people conduct their day to day activates. This tool were adapted from Saleh et al., (2020) & Khatab, & Elshnawie, (2021) to assess and evaluated the quality of life of patient with vitiligo. It was included assessment of the following parts:

Part 1: to assess patient practice regarding physical activity (14).

Part 2: to assess patient practice regarding dietary pattern (16).

Part 3: to assess patient practice regarding follow up with physician (14).

Part 4: to assess patient practice regarding psychological aspects (23).

Part 5: to assess patient practice regarding spiritual aspects (11)

Part 6: to assess patient practice regarding Social support (25).

Scoring system: Evaluated the quality of life of patient with vitiligo consist of 103 questions, the correct answer was scored 2 point, incomplete correct 1 point and incorrect 0 point, and satisfactory level was detected based on statistical analysis as following:

Satisfactory knowledge level ≥ 70%

Unsatisfactory knowledge level < 70%

II- Operational design:

The operational design include Preparatory phase, content Validity and Reliability, pilot study and fieldwork

- **Preparatory phase*:***

It included reviewing of past, current, national and international related literature and theoretical knowledge of various aspects of the study using books, articles, internet, periodicals and magazines to develop tools for data collection.

Validity:

It was done for used tools to evaluate each item on the tool as to its degree of representation of the variable to be tested, as well as the tool over all appropriateness for use in examining the variable within the proposed study population. The content validity of the tools was done by a panel of 5 experts in medical surgical nursing, who reviewed the content of the tools for comprehensiveness, accuracy, clarity, relevance and applicability. Suggestions were given and modifications were done. Tool validity: Content validity as a qualitative form of validity that evaluates whether the expressions contained in the measuring instrument represent the phenomenon intended to be measured.

Reliability:

Reliability of instrument is " the extent to which the instrument yields consistent, reproducible estimates of what is assumed to be an underlying true score" The degree to which an instrument measures the same way each time it used under the same condition with the same subjects. Reliability of the tool was tested to determine the extent to which the questionnaire items are related to each other. Reliability of the questionnaire was assessed using Cronbach's alpha reliability coefficient. The reliability was scaled as follows: <0-0.25 weak reliability, 0.25-0.75 moderate reliability, 0.75-<1strong reliability and 1 is optimum. The reliability for this questionnaire was 0.**8**2.

Construct	**Cronbach's Alpha**	**P value**
Knowledge Assessment Questionnaire	0.802	<0.001*
vitiligo Disease Quality of Life	0.765	<0.001*

Ethical considerations:

An ethical approval to conduct the proposed study was obtained from the Scientific Research, Ethical committee of the faculty of Nursing, Helwan university

The study facilitation letter to conduct the study was received from the postgraduate studies department of the faculty of Nursing at Helwan university and sent to the director of Fayoum university Hospital.

An official permission was obtained from the administrative authority of the selected setting for the current study

Participation in the study was voluntary, studied patients were given complete full information about the study and their role before signing the informed consent.

The ethical considerations will include explaining the purpose and nature of the study, stating the possibility to withdraw at any time, confidentiality of data assured by the researcher by using codes to identify participants instead of names or any other identifiers.

Pilot study:

A Pilot study was carried out with 10% (not less than 10 patients(of the sample under study to test the applicability, clarity and efficiency of the tools, then the tools modified according to the results of the pilot study. Modifications included: rephrasing and rearrangement of some questions. After modification, the final form of the tools were developed. Patients who shared in pilot study are excluded from the study sample.

Field work:

Once the necessary approvals allowed to proceed with the proposed study, data collection was started and continued until the assigned number of study sample were completed (from the beginning of February 2024 to the end of September 2024). The study was implemented through the following four phases of the nursing process :

- Assessment phase
- Design phase
- Implementation phase
- Evaluation phase

1) Assessment phase:

- It was the program initial step, where data were gathered from patients and from their current medical reports as baseline measures for their knowledge and patient's quality of life. Using study tools, I, II, III. Which included socio demographic data, assessment for patient's knowledge and assessment for patient's quality of life.

- During this phase, the researcher visited to dermatological outpatient clinic and contacts with nurses, physician and clarify the aim of the study to obtain their best possible cooperation. The researcher visited the selected setting regularly, three days per week. The patient who met study criteria was included in the study after explaining the nature and purpose of the study and obtaining their consent.

- The researcher used personal interviews to collect data from patients, after introduced herself, and explained the purpose and nature of the research. Each patient was interviewed individually in order to collect the baseline patient’s data using tool I, II. Before the patients received ultraviolet A light, (UVA) or ultraviolet B light (UVB) the standard hospital care by the responsible nurse the researcher starts to use tool (I) and tool (II. for study groups as follows:

- **Tool I: part 1:** was utilized to assess patients’ Socio demographic characteristics, were obtained through patients interview.

- **Tool II: part 2:** to assess Patients' Knowledge regarding definition of vitiligo, melanocytes, types of vitiligo, causes, classifications, clinical manifestations, treatment of vitiligo, healthy eating, psychological and social problems.

- **Tool II:** to assess Patients' quality of life regarding physical activity, dietary pattern, follow up with physician, psychological aspects, spiritual aspects and Social support.

II- Planning and design phase:

- This phase included analysis of the pre-test findings; where goals and outcomes are formulated that directly impact patient care. The researcher plan intervention, design the educational section's content according to the patient's needs. Detected needs, requirements and deficiencies were translated into the aim and objectives of the educational program sections in the form of guidelines booklet.

- The researcher develops an instructional colored booklet to be given for each patient in the study group in the implementation phase. It was formulated in simple, easily readable Arabic words, completed with photos and illustrations in order to improve patient's knowledge and quality of life.

III- Implementation phase:

Based on the results obtained from the interviewing and observational sheets, as well as literature review, the self-care program was developed by the researcher. It was implemented immediately after the pre-test**.**

The designed nursing program was implemented through 7 sessions (2 theoretical & 5 practical) as following:

Each subject of the study group received a copy from the booklet which facilitated the process of education and helped reminding the subjects about important information at home.

Theoretical part divided into 2 sessions:

First Session (Theoretical session)

Time: 30- 45 minutes

Objectives: During this session the researcher introduces herself and explain the aim and nature of the study for the patient. After patient agreement to participate in the study, Session was aimed to empower patient with knowledge regarding purpose of the educational program & information about anatomy and physiology of the skin, definition of vitiligo, melanocyte and melanin, how vitiligo transmission & the development of vitiligo**.**

Second Session (Theoretical session)

Time: 30- 45 minutes

At the beginning of the session the researcher started by reviewed the summary of the previous session then start the session by clarifying its aim and objectives.

Objectives: session was aimed to empower patient with knowledge regarding types of vitiligo, causes of vitiligo, signs & symptoms of vitiligo, diagnosis & treatment of vitiligo and complications that may occur.

Practical part divided into 5 sessions:

First session (practical session)

Time: 30- 45 minutes

Objectives: Session was aimed to empower patient with practices regarding hand washing,

The researcher used teaching methods and aids like discussion, videos, pictures, and booklet.

Second session (practical session)

Time: 30- 45 minutes

- At the beginning of the session the researcher started by reviewed the summary of the previous session then start the session by clarifying its aim and objectives.

Objectives: Session was aimed to empower patient with practices regarding how to use sun block and instruction for healthy physical status.

The researcher used teaching methods and aids like discussion, videos, pictures, and booklet.

Third session (practical session)

Time: 30- 45 minutes

- At the beginning of the session the researcher started by reviewed the summary of the previous session then start the session by clarifying its aim and objectives.

Objectives: - Session was aimed to empower patient with practices regarding perform warm compresses for dry eye and prepare healthy breakfast and instruction for healthy dietary guidelines.

The researcher used teaching methods and aids like discussion using video, demonstration, poster and booklet.

Four Session (Practical session)

Time: 30- 45 minutes

- At the beginning of the session the researcher started by reviewed the summary of the previous session then start the session by clarifying its aim and objectives.

Objectives: Session was aimed to empower patient with practices regarding deep breathing exercise, straight body posture for strong self confidence, steps for strong self confidence and importance to perform communication with others.

The researcher used teaching methods and aids like, Arabic hand out, videos, pictures, group discussion and booklet.

Fifth Session (Practical session)

Time: 30- 45 minutes

- At the beginning of the session the researcher started by reviewed the summary of the previous session then start the session by clarifying its aim and objectives

Objectives: Session was aimed to empower patient with practices regarding straight body posture for strong self confidence, steps for strong self confidence and perform communication with others.

The researcher used teaching methods and aids like, Arabic hand out, videos, pictures, group discussion and booklet.

- The researcher started teaching lectures from 9 am to 1 pm 3 days/ week
- At the beginning of each session, discussions about the previously explained topics to patients were done by the researcher to determine their knowledge level as well as misremembered and vague points. Then, a summary of the last session was given to help the patients to restore their memories.
- During each session, the researcher applied the teaching strategies for patients using simple, brief, and comprehensible words. At the end of each session, every patient received a short summary of important points. Furthermore, an instructional booklet and video was provided to patients in the study group to attract their attention and motivate them.
- The researcher used different teaching methods as lectures followed by discussion, demonstration, and re-demonstration, also the researcher used different media for teaching included pictures, videos, and handouts.
- Each patient received frequent telephone calls (two calls a week) post-nursing program finish that extended for 3 months to assure patients adherence to the treatment plan. Moreover, regular meeting at outpatient clinic was held to discuss patients' difficulties that developed at home.
- The researcher and patients meeting them during follow-up visits in outpatient clinics to finish data collection during the follow-up period.

V- Evaluation phase:

- Evaluation phase aimed to reassess patients after implementation of nursing program to identify progress in term of differences in patients' level of response from baseline. The study patients were evaluated 3 times by study tools as following :
- The first evaluation (pretest) was done at the First visit in outpatient dermatological clinic using tool I II, III.
- The second evaluation (posttest) was done after 3weaks from implementation of the intervention-using tool II, III.
- Follow up was done three months after implementation of the intervention-using tool II & III.

Administrative design

An official permission was obtained from the director of fayoum University Hospital, in which the study was conducted. A letter was issued to them from the faculty of Nursing; Helwan University explains the aim of the study for obtaining the permission for data collection.

Statistical design & analysis

The data were collected and coded to facilitate data manipulation and double entered into Microsoft Access, then analyzed, and presented in the form of frequencies and percentages or mean± SD, in the form of tables, figures, and diagrams as required and suitable statistical tests were used to test the significance of the results obtained.

Qualitative data were presented as frequencies (n) and percentages (%). Chi-square test were used to examine the relation between qualitative variables.

Numerical data were presented as mean and standard deviation (SD) and range values. Spearman's correlation coefficient was used to determine correlations between different variables.

The significance level was set at P ≤ 0.05. Statistical analysis was performed with "IBM-SPSS" Statistics Version 26 for Windows.

3. RESULTS

Table (1): Numbers/ Percentage distribution demographic and socioeconomic characteristics of Patients

	N	%
Age		
20- <30	14	28
30- <40	20	40
40- <50	11	22
50 or more	5	10
Mean±SD	31.4±5.26	
Gender		
Male	16	32
Female	34	68
Residence		
Rural	28	56
Urban	22	44
Marital status		
Single	8	16
Married	31	62
Divorced	5	10
Widowed	6	12
Level of education		
Illiterate	17	34
Secondary	24	48
University	9	18
Occupation		
Officer	8	16
Hand work	12	24
Housewife	27	54
Retired	3	6
Economical status		
Less than enough	31	62
Enough	19	38
More than enough	0	0
State of the house		
Have pure water	50	100
Have electricity	50	100
Have sewage	42	84
Duration of diagnosis of the disease		
Less than 5 years	25	50
From 5 to 10 years	18	36
More than 10 years	7	14
Does anyone in the family suffer from vitiligo		
Yes	18	36
No	32	64

Table (1) shows that Numbers/ Percentage distribution demographic and socioeconomic characteristics of Patients, it illustrate (40%) of Patients regarding their age falls between 30 and 40 years, the mean age of them was 31.4 years. As regards to gender 68% of patients were females. Also 56% of them reside in rural areas. Moreover, 62% of Patients are married. In relation to the educational level of the Patients, it was found that 48% have attained a secondary education, while 34% are illiterate. In terms of occupation54% of Patients housewives. In relation to Economical status, 62% of patients report having less than enough resources. All participants have access to clean water and electricity, but 84% have sewage systems in their homes. Regarding the duration of diagnosis, 50% have lived with the disease for less than five years. Additionally, 36% of participants report having a family history of vitiligo, underscoring the potential genetic or familial predisposition to the condition.

Table (2): Total Knowledge regarding Meaning of Vitiligo, Treatment, Healthy Eating, Physical habits, psychological and social problems: Pre, Post-Intervention, and Follow up Results

Items of knowledge	**Pre**				**Post**				**Follow up**				**Chi-square**			
	Satisfactory		Unsatisfactory		Satisfactory		Unsatisfactory		Satisfactory		Unsatisfactory		P_1		P_2	
	N	%	N	%	N	%	N	%	N	%	N	%	X^2	P-value	X^2	P-value
Meaning of vitiligo	12	24	38	76	41	82	9	18	39	78	11	22	33.762	<0.001*	0.250	0.617
Treatment of vitiligo	15	30	35	70	46	92	4	8	43	86	7	14	40.395	<0.001*	0.919	0.338
Healthy eating habits	17	34	33	66	42	84	8	16	42	84	8	16	25.837	<0.001*	0.000	1.000
Physical habits, psychological and social problems	19	38	31	62	43	86	7	14	42	84	8	16	24.448	<0.001*	0.078	0.779
Select the wright answer	18	36	32	64	45	90	5	10	40	80	10	20	33.277	<0.001*	1.961	0.161

Table (2) summarizes participants' total knowledge regarding Meaning Vitiligo, treatment, healthy eating habits, physical habits, and psychological/social problems—before, after, and follow up intervention. Substantial improvements were observed in each category post-intervention, with a marked increase in satisfactory knowledge levels. For instance, satisfactory knowledge of vitiligo increased from 24% pre-intervention to 82% immediately post-intervention, and retention remained high at 78% in the follow-up. In the category of treatment knowledge, satisfactory understanding increased dramatically from 30% pre-intervention to 92% post-intervention, with retention at 86%% in the follow-up. Awareness of healthy eating habits improved significantly, with satisfactory responses rising from 34% to 84% after the intervention, and retention maintained at 84%. Similarly, knowledge of physical habits, psychological, and social problems increased from 38% to 86% post-intervention, with minor variations in retention (84%).

The Chi-square (X^2) values indicate significant improvements across all categories ($P < 0.001$), confirming the effectiveness of the intervention in increasing knowledge. Post-test P-values suggest stable knowledge retention, with no significant decline in understanding.

Fig (1): Total Knowledge Improvement in Vitiligo: Pre, Post-Intervention, and Follow up Analysis

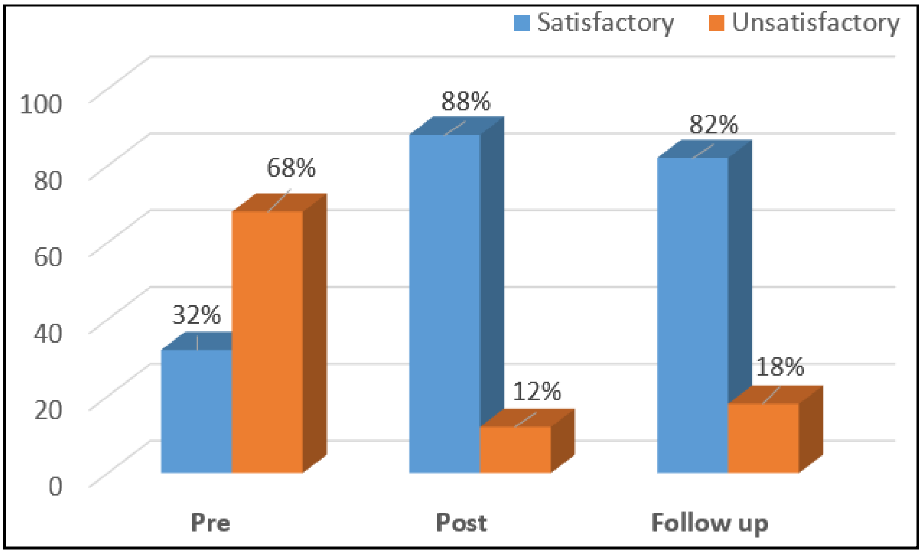

Fig. 1 show that a statistical significant improvement in participants' knowledge Regarding vitiligo knowledge after implementation an educational intervention.

Table (3): Quality of Life (QOL) Indicators: Pre, Post-Intervention, and Follow up Changes in Physical, Social, and Psychological Domains

Items of QOL	Pre						Post						Follow up						Chi-square			
	High		Moderate		Low		High		Moderate		Low		High		Moderate		Low		P_1		P_2	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	X^2	P-value	X^2	P-value
Physical status	7	14	24	48	19	38	38	76	10	20	2	4	36	72	7	14	7	14	40.882	<0.001*	3.361	0.186
Nutritional health	16	32	20	40	14	28	36	72	8	16	6	12	32	64	7	14	11	22	16.035	<0.001*	1.773	0.412
Follow-up with physician	13	26	25	50	12	24	39	78	9	18	2	4	37	74	8	16	5	10	27.672	<0.001*	1.397	0.497
Psychological	8	16	21	42	21	42	34	68	11	22	5	10	30	60	6	12	14	28	29.066	<0.001*	5.987	0.052
spiritual-assessment	12	24	19	38	19	38	37	74	6	12	7	14	31	62	12	24	7	14	25.054	<0.001*	2.529	0.282
Social	9	18	17	34	24	48	36	72	9	18	5	10	35	70	10	20	5	10	31.110	<0.001*	0.067	0.967

Table 3 illustrates significant improvements in several dimensions of quality of life (QOL) following the intervention. The most notable change occurred in the domain of physical behaviors, where the percentage of individuals experiencing high physical functioning increased dramatically from 14% pre-intervention to 76% post-intervention ($P < 0.001$). Psychological well-being showed significant improvement as well, moving from 16% of individuals reporting high levels of psychological functioning pre-intervention to 68% post-intervention ($P < 0.001$). Moreover, spiritual-assessment and social aspects also showed positive trends, particularly with social improving from 18% to 72% ($P < 0.001$).

Fig 2: Total Quality of Life (QOL) Improvement Pre, Post-Intervention, and Follow up Outcomes

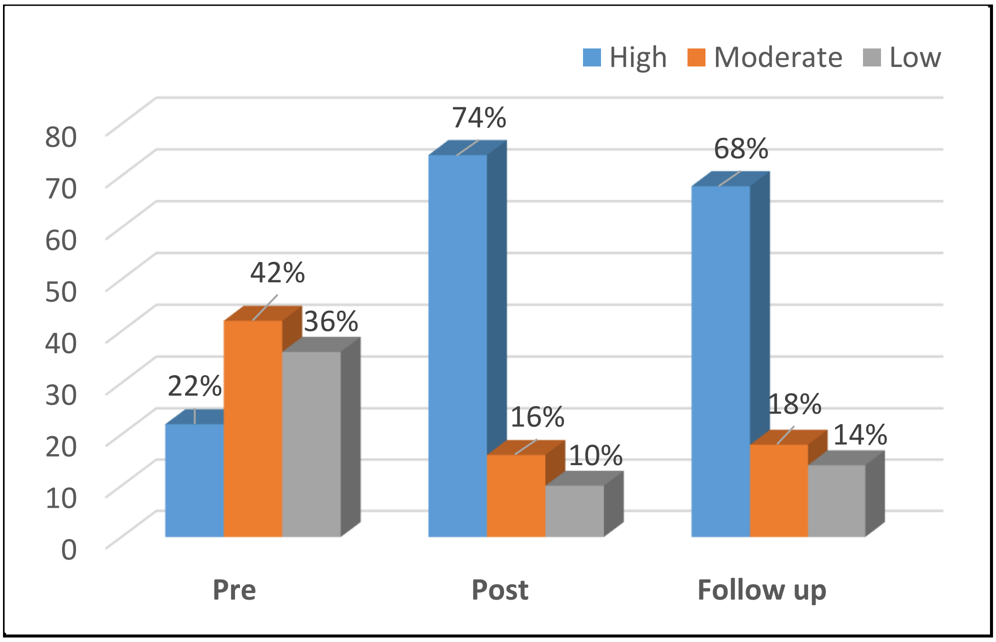

Fig 2: illustrate total Quality of Life (QOL) scores reflect significant improvements following the intervention. The percentage of participants reporting a high QOL increased substantially from 22% pre-intervention to 74% immediately post-intervention, maintaining 68% at the follow-up ($P < 0.001$). Conversely, the proportion of individuals with low QOL decreased from 36% pre-intervention to just 10% immediately post-intervention, though it rose slightly to 14% in the long term. Moderate QOL levels also saw a notable reduction, from 42% pre-intervention to 16% immediately post-intervention.

Table (4): Correlation Between various QOL domains and total Quality of Life (QOL) with Total Knowledge pre, post and follow up.

Items of QOL	**Total knowledge**					
	Pre		Post		Follow up	
	R	P-value	R	P-value	R	P-value
Physical status	0.727	<0.001*	0.372	<0.001*	0.556	<0.001*
Nutritional health	0.384	<0.001*	0.425	<0.001*	0.332	<0.001*
Follow-up with physician	0.203	0.035*	0.269	0.008*	0.230	0.004*
Psychological	0.630	<0.001*	0.375	0.002*	0.678	<0.001*
Spiritual-assessment	0.484	<0.001*	0.695	<0.001*	0.523	<0.001*
Social	0.377	<0.001*	0.234	0.003*	0.537	<0.001*
Total QOL	0.745	<0.001*	0.833	<0.001*	0.719	<0.001*

Table (4) The analysis reveals significant positive correlations between total knowledge and various QOL domains across pre-, post-, and follow-up phases. Initially, physical status ($r = 0.727$, $p < 0.001$)* and total QOL ($r = 0.745$, $p < 0.001$)* exhibited the strongest associations. Post-intervention, spiritual assessment ($r = 0.695$, $p < 0.001$)* and total QOL ($r = 0.833$, $p < 0.001$)* showed. At follow-up, psychological ($r = 0.678$, $p < 0.001$)* and total QOL ($r = 0.719$, $p < 0.00$

4. DISCUSSION

As regard to demographic characteristics among the studied sample, the study findings showed that around two thirds of study participants age ranged from thirty to forty with mean age (31.4±5.26). this results aligns with epidemiological data suggesting that vitiligo commonly appears in young to middle-aged adults, a period when individuals are more socially and professionally active. Additionally, the mean age suggests that most participants were in their early thirties, reinforcing the need for timely education and support during the peak years of social and professional development.

the current study finding was compatible with the study conducted by **(Abdou *et al.*, 2024)** who assessed “Quality of Life for Vitiligo Patients and Its Associated Factors: A Descriptive Study” they concluded that mean age of study participants was 33.67 ± 15.98.

The current study finding was disagreed with the study conducted by **(Al-Shammari *et al.*, 2021)** who study “ Quality of life in vitiligo patients in central Saudi Arabia” they found that near to two thirds of study participants their age was under thirty years.

As regards gender, findings of the present study showed that more than two thirds of study participants were female. This may be due to hormonal influences, greater autoimmune susceptibility, and increased healthcare-seeking behavior. This finding is consistent with **(Abdou *et al.*, 2024)** who concluded that more than half of study participants were female. The same as reported by **(Tabassum *et al.*, 2023)** who reported that the highest percentage of study sample were female.

Concerning Residence, the current study found that more than half of study participants were from rural areas. This may be attributed to limited access to specialized dermatological care, leading to increased participation in educational programs offering support.

The current study finding was compatible with the study conducted by The current study finding was compatible with the study conducted by **(Mohmoud *et al.*, 2023)** whose study entitled “ Psychosocial status and quality of life among vitiligo patients” found that more than two thirds of study participants resided in rural area.

Regarding to Marital status, the current study findings displayed that more than three fifth were married. The current study results were similar to the study conducted by **(Alhumam *et al.*, 2024)** entitled “ Assessment of the Quality of Life of Vitiligo Patients: A Cross-Sectional Study in the Eastern Region of Saudi Arabia.” They reported that more than two thirds of study participants were married.

Related to Level of education, the current study found that near to half of study participants had secondary school degree. This may be linked to the fact that many were from rural areas, where educational opportunities beyond secondary school are often limited. In rural communities, access to higher education institutions may be restricted due to economic constraints, fewer educational facilities, or the need for early workforce participation.

The current study finding was in agreement with the study conducted by **(Abdou *et al.*, 2024)** who concluded that the highest percentage of study sample had secondary school degree. At the same line, **(Tawfek *et al.*, 2024)** who conducted study entitled " Assessment of Awareness and Psychological Status of Vitiligo Patients in Selected Dermatological Hospitals at Minia City" they found that the highest percentage of study sample had secondary school degree. In the same line, this result in contrast with **(Asati *et al.*, 2016)** in which majority of vitiligo patients were graduate and above.

Concerning Occupation, the current study findings showed that more than half of study participant were housewife. The current study finding was in agreement with the study conducted by **(Alhumam *et al.*, 2024)** who found that more than half of study sample were housewives. Also, **(Mohmoud *et al.*, 2023)** concluded that around two thirds of study participants were housewives.

Regarding to economic status, the current study findings showed that more than three fifths their income was less than enough. The current study finding was compatible with the study conducted by **(Abdelrahman *et al.*, 2023)** whose study entitled " Effect of Applying Roy's Adaptation Model on Quality of Life for Patients with Vitiligo." Found that more than half of study sample their income was not enough.

Related to Duration of diagnosis of the disease, it was noticed that almost half of the study sample had the disease for less than five years. The current study findings was aligned with the study conducted by **(Saber Abd El-Nady *et al.*, 2019)** who found that more than half of the study sample had the disease for less than five years.

As regards family history of vitiligo, the current study illustrated that more than three fifths of study participants had no family history of vitiligo. This result was confirmed by the study of **(Abd-El Mohsen *et al.*, 2020)** who concluded that more than half of study sample had no family history.

Regarding Total Knowledge of vitiligo This finding is consistent with **(Abdelrahman *et al.*, 2023)** whose study entitled " Effect of Applying Roy's Adaptation Model on Quality of Life for Patients with Vitiligo" showed that there was no statistically significant difference between the study and control groups regarding knowledge items of vitiligo pre Roy's adaptation model ($p>0.05$). However, a highly statistically significant difference was noticed between both groups regarding all items of knowledge post one and three months of Roy's adaptation model implementation ($p \leq 0.001$).

These findings were supported by **(El-Gilany *et al.*, 2021)**, who conducted a study entitled" Knowledge of patients, relatives and non-relatives and their attitude towards vitiligo" shows, that the vast majority of patients and their relatives have sufficient knowledge about vitiligo post intervention.

These findings were supported by **(Keraryi *et al.*, 2022)**, who conducted a study about does the Saudi population have sufficient awareness of vitiligo and found that most of the respondents (83.7%) had an adequate knowledge level of vitiligo. The current study was in an agreement with **(Juntongjin *et al.*, 2018)**who found that the vast majority of patients have satisfactory knowledge level about vitiligo.

The current study wasn't in an agreement with **(Rachawong *et al.*, 2016)** whose study entitled " Educational video vs pamphlet: interventions to improve knowledge and attitude toward vitiligo." showed that in knowledge part, the mean difference from baseline to immediately and immediately to Day 7 after intervention had not showed statistically difference ($p=0.29$, $p=0.17$ respectively). These finding suggest that both video and pamphlet could improve the knowledge at immediately and at Day 7 equally.

Regarding Overall Quality of Life (QOL), The current study finding is in agreement with the study of **(Awad[1] *et al.*, 2024)** who found that implementing an educational program significantly enhanced patients' knowledge about vitiligo and improved their quality of life. Initially, only a small percentage of patients had satisfactory knowledge, but this increased substantially post-intervention. Similarly, quality of life scores improved notably after the educational program.

The current study finding was agree with the study of The current study finding was agree with the study of **(Chan *et al.*, 2018)** who analyzed various treatments, including educational and psychological interventions, and found that these approaches can significantly enhance patients' quality of life. The review concluded that addressing both the physical and psychological aspects of vitiligo is crucial for improving overall well-being.

The study finding was confirmed with **(Al-Shammari *et al.*, 2021)** their findings revealed that participants who engaged with the web-based intervention experienced significant improvements in their quality of life compared to those who did not receive the intervention.

Regarding correlation between total quality of life (QoL) with total knowledge, the current study findings showed that there was a significant positive correlations between total knowledge and QOL across pre-, post-, and follow-up phases. The significant positive correlation between total knowledge and quality of life (QoL) suggests that increased awareness and understanding of vitiligo contributed to better coping strategies, improved self-care, and enhanced psychological well-being. As participants gained more knowledge through the educational program, they likely experienced reduced anxiety, greater confidence in managing their condition, and improved adherence to healthy behaviors. This relationship underscores the importance of patient education in enhancing overall well-being and long-term quality of life. This result was confirmed by the study of **(El-Gilany *et al.*, 2021)** who found that there was a significant correlations between total knowledge and QOL.

5. CONCLUSION

In the light of the study findings, there was an improvement of patients’ level of knowledge regarding care of their disease which leads to improvement of patients’ quality of life.

6. RECOMMENDATIONS

Based upon findings of the current study, the following recommendations were suggested:

1) The developed of educational programme for patients with vitiligo should be implemented on a wider scale and evaluated for further improvement.

2) A family member or significant other should attend the educational programme sessions.

3) Offering booklets regarding the management of vitiligo patients for nurses to understand how to deal with vitiligo cases

4) Educational programme toward vitiligo patients should be conducted for nurses, as they are the key to improve nurses' knowledge and practice and enhance vitiligo patient care outcomes.

5) Preparing a program through media for increasing awareness of family members regarding cause of vitiligo, mode of transmission and method of prevention.

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