Effect of Prostatic Cancer Educational Program on Patients' Health Outcomes

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Abstract

Background: Prostate cancer (PC) is the commonest cause of cancer-related death in men globally. So, patients need accessible and adequate health education regarding preventive and diagnostic strategies to appraise their knowledge, practice and perception as an outcome. **Aim:** To evaluate the effect of prostatic cancer educational program on patients' health outcomes. **Method:** A quasi-experimental design was used to complete the study on 60 patients as a purposive sample chosen by simple random sampling technique. **Tools: I)** Structured interview questionnaire including patients' personal data, Clinical data, and knowledge, **II)** Prostatic cancer preventive practices questionnaire (PCPPQ), **III)** Prostatic cancer perception questionnaire. **Setting:** The study was carried out in the urology departments at Suez-Canal and Ain shams University Hospitals, Egypt. **Results:** here is a statistically significant difference related to knowledge practices, and perception levels of the studied patients regarding prostate cancer pre-, immediate post and post-one month of implementing the educational program. **Conclusion:** The educational program has significant effect on improving patients' with PC outcomes. **Recommendations:** Identify and address common barriers to prostate cancer screening, such as financial issues, lack of health insurance misconception.

Keywords: Educational Program, Health Outcomes, Prostatic Cancer

Introduction:

Prostate cancer (PC) specifically affects the anatomical area responsible for sexual function. Owing to the location of the prostate gland and the delicate nature of the treatment, men with prostate cancer often face a host of difficulties, which can affect psychological conditions and increase stress and anxiety (**Abd-Almonaem et al., 2021**). Worldwide, Prostate Cancer, accounted for 1,800,000 newly diagnosed cases globally in 2020, to be the most often diagnosed cancer and being the sixth most prevalent cause of cancer-related deaths in men (**Wang et al., 2022**). North Africa has a lot of PC, with an annual incidence of more than 200 cases per 100,000 persons, to be the second most frequent malignancy in men, after liver cancer (**Rawla, (2019**). Prostate cancer is the second largest cause of death in Egypt, with an annual incidence of 25/100,000, to be the fifth type in Egypt and represents 11% of male tumors (**WHO, 2022**).

The exact cause of prostate cancer is not easy to determine. Major risk factors that are believed to affect one's chance of developing prostate cancer includes increasing age, positive family history, and race. Other risk factors such as, diet, obesity, smoking may have some connection to the pathogenesis of the disease (**American Cancer Society, 2020**). The early detection of the disease in early stages can be an effective measure to reduce the mortality rate in asymptomatic men and provides an opportunity to create an effective and inexpensive therapeutic method for people (**Centers for Disease Control and Prevention, 2020**).

The risks of PC highlight the importance of preventive practices, as lack of awareness,

preventive strategies, negative beliefs, and increased life expectancy contribute to 57% of all new cancer cases around the world (**Lortet-Tieulent et al., 2020**). Financial difficulties, a lack of health insurance, poor health-seeking behaviors, and a lack of resources, expertise, or cultural familiarity are all identifiable obstacles to the early detection and screening of PC. The use of health and preventive services is severely hampered by these obstacles, as well as a fear of cancer screening procedures and a lack of knowledge about health prevention (**Persaud et al., 2021**).

Perception can be described as the capacity to see, hear, or become conscious of something within the senses and the method in which something is seen, understood or explained. Perception is a process that happens everywhere (**Cherry, 2024**). lifestyle modifications including stopping smoking, exercising, and managing weight can reduce the chance of prostate cancer. Early prostate cancer screening and the use of other signs may help avoid over diagnosis (**Ferlay et al., 2018**).

Nurses play an important role in the health care team, having knowledge and assessing patients, gathering data about personal and family history, and using evidence-based guidelines. Regular assessment of patient needs, provision of information and support in the form of educational program, symptom control, and screening for prostate cancer can decrease morbidity and mortality associated (**Kamberi & Jaho, 2020**).

Significance of the study:

Prostate cancer is the most common cancer in men in 112 countries, accounting for 15% of all male cancers (**James et al., 2024**). According to a recent Lancet Commission, the number of new prostate cancer cases annually is projected to rise from 1.4 million in 2020 to 2.9 million by 2040, driven by demographic changes and increased life expectancy (**James et al., 2024**). Prostate cancer has a good survival rate when compared to other cancers, but because despair, suicide, and psychological anguish are so common and can last for a long time after diagnosis. This emphasizes the need for efficient treatments that lessen the psychological effects of prostate cancer from the time of diagnosis to long-term survival (**Crump et al., 2023**).

In Egypt, according to the Global Cancer Observatory **(GLOBOCAN), (2020)** age-standardized incidence rate is (13.9) per 100,000 and the estimated prevalent cases (in the last 5 years) and deaths for all ages are (10,532) cases and (2227) deaths respectively. In Egypt, by 2040 the estimated number of incident cases and death of prostate cancer will be expected to rise to (9607) cases and (4978) deaths respectively. Also, the worldwide prostate cancer burden is expected to grow to almost (2,426, 825) million new cases and (739, 861) deaths by 2040 simply due to the growth and the aging of the population (**Culp et al., 2020**).

Educational programs can significantly enhance patients' understanding of prostate cancer, its risk factors, symptoms, and the importance of early detection. This increased knowledge can lead to better health-seeking behaviors and timely medical consultations. By educating patients about preventive measures, such programs can encourage lifestyle changes and regular screenings, which are crucial for early detection and prevention of prostate cancer. So, patients who are well-informed about their condition are more likely to adhere to treatment plans, follow medical advice, leading to improved health outcomes, potentially higher survival rates, and overall cost savings in the health-care system.

Education empowers patients by giving them the knowledge and tools to take control of their health. This can improve their quality of life, reduce anxiety related to the disease, and enhance their overall well-being. The educational programs can be tailored to reach under-served populations who may have limited access to health-care information. This can help reduce health disparities and ensure that all patients have the opportunity to benefit from early detection and treatment. By focusing on these areas, the study can provide valuable insights into how educational interventions can be optimized to improve patient outcomes and contribute to the overall fight against prostate cancer.

Operational definition

Health outcomes: in this study refer to patients' knowledge, practice and perception with prostatic cancer.

Study Aim:

The aim of the present research study is to evaluate the effect of prostatic cancer educational program on patients' health outcomes through the following objectives: -

1. Assess knowledge, behavioral change practices and perceptions' levels for patient with prostate cancer.

2. Develop and implement a prostate cancer educational program.

3. Monitor the effect of the application of the prostate cancer educational program on patients' health outcome.

Research hypothesis:

Implementing a comprehensive educational program for patients with prostatic cancer will significantly improve their health outcomes, as evidenced by increased knowledge about the disease, enhanced adherence to preventive behavioral practices, and improve perception toward the disease management.

Methods

Research design:

A quasi-experimental design (pre-test/ post-test) was utilized to accomplish the aim of the present study. A quasi-experimental design is a research method that allows for the establishment of a relationship between dependent and independent variables, resembling a cause and-effect relationship **(Thomas, 2022).**

Study setting:

The current study was carried out at the urology departments at Suez-Canal University Hospitals and Ain shams University Hospitals. They are two of the largest educational hospitals and they are well equipped with advanced technology and manpower needed for patients' care.

Study subjects:

A purposive sample of patients with prostatic cancer with the following inclusion criteria: Adult men aged from 30 to 60 years old, able to communicate effectively, voluntary participate in the study, and free from cognitive and psychiatric impairment.the sample was chosen using simple random method. One group is involved to be the control for itself at the pre-test phase, then become the experimental at the post-test phase. Based on power analysis using SPSS program version 32, with level of significance=0.05 and power=95%, the sample size calculate by the next formula using Steven and Thompson equation

$$n = \frac{N \times p\,(1-p)}{[(N-1) \times (d^2 \div Z^2) + (p\,(1-p))]}$$

As N= Population (70), Z= confidence level 95% (1.96), P= probability (50%), and d= margin of error (0.05). So, sample size (n) = 60 **(Thompson, 2012)**.

Tools of data collection:

The data needed for this research study was collected through using the following tools:

Tool (I): Structured interview questionnaire: that was developed by researchers based on the review of recent and related literature **(Yeboah-Asiamah et al., 2017; Jocham& Miller 2019)** and divide into three parts:

1st part: Personal data: including data about age, gender, marital status, education level and occupation, place of residence and family history of PC.

2nd part: Clinical data: It was adapted from **(Jack, 2017)** and include questions about, chronic diseases (hypertension, diabetes, respiratory diseases, and kidney diseases), date of disease onset, stages of the disease, age at the onset of illness and type of treatment the patient received.

Part III: Prostatic cancer knowledge (PCK): It was adapted from **(Mohamed et al., 2021)** and consist of ten closed ended questions

related to prostate cancer definition, causes, signs, symptoms, risk factors and treatment.

Scoring system:

The questions were scored on a 3-point Likert scale of "agree", "don't know" and "don't agree". The scale was scored as agree 1, don't know 0 and don't agree 0 for the positive statements, and "don't agree" 1, "don't know" 0 and "agree" 0 for the negative statements. The maximum score is 10. Patients who had a score of 6 and above are classified as having high knowledge and those with scores of less than 6 were considered to have low knowledge **(Mohamed et al., 2021).**

Tool (II): Prostatic cancer preventive practices questionnaire (PCPPQ): It was developed by the researchers based on relevant English literature **(Rock et al., 2020; Brookman-May et al., 2019 & Vasconcelos et al., 2019)** to assess respondents' preventive practices regarding prostatic cancer. It consisted of 12 items and assessed how often the respondents practiced certain preventive behaviors (diet, health-professional help-seeking, and lifestyle modifications including smoking cessation/prevention, exercise and physical activity, sleep, stress control, and weight reduction) in day-to-day activities.

Scoring

Participants were given a 4-point Likert scale ranging from never (1) to always (4), to evaluate their responses. A higher total score reflects better preventive practices.

Tool (III): Prostatic cancer perception questionnaire: It was adapted from **(Yeboah-Asiamah et al., 2017).** Perceptions about PC was assessed using 13 items on causes, risk factors, severity and treatment. The items were scored on a 3-point Likert scale of "agree", "don't know" and "disagree".

Scoring system:

The scale was scored as "agree" 1, "don't know" 0 and "don't agree" 0 for the positive statements, and "disagree" 1, "don't know" 0 and "agree" 0 for the negative statements. Scores were totaled per respondent; the maximum score is 13. Consequently, a score of 7 and above was classified as good perception and scores less than 7 were classified as poor perception **(Yeboah-Asiamah et al., 2017).**

Tools validity:

All of the research tools was translated into Arabic by the researchers and a language expert before being presented to a bilingual group of experts in medical surgical nursing field (2 professors and 3 assistant professors) at the faculty of nursing in Suez-Canal and Helwan University for testing face and content validity. Minor adjustments were made, and the tools were deemed valid from their perspective.

Tools reliability:

The Cronbach's alpha coefficient reliability test showed good internal consistency of the tool, Prostatic cancer knowledge questionnaire (PCKQ) with scoring 0.90, Prostatic cancer preventive practices questionnaire (PCPPQ) 0.79, and Prostatic cancer perception questionnaire scoring 0.86.

Pilot study:

A pilot study was carried out before starting data collection on 10% of the studied patients (6 patients) to evaluate the clarity, feasibility, and applicability of the tools as well as well as estimate the time needed to fill out. The pilot was excluded from the study as the tools of data collection modified. I taking place in April, 2024.

Ethical considerations:

An official permission to conduct the proposed study was obtained from the Scientific Research Ethics Committee from the Faculty of Nursing, Helwan University and granted ethical approval for a study number (40) with date 18/3/2024. Participation in the study was voluntary and studied patients were given full information about the study and their role before signing the informed consent. The ethical considerations were included explaining the purpose and nature of the study, stating the

possibility to withdraw at any time, confidentiality of the information where it was not accessed by any other party without taking the permission of the participants. Ethics, values, culture and beliefs of the participants were respected.

Field work:

The current study was carried out in four phases including the assessment, planning, implementation, and evaluation phases. These phases were carried out from the beginning of April, 2024 to December, 2024 as follow:

A-Assessment phase

Before running the program, studied patients were interviewed individually to initiate good rapport, the data was collected by the previously mentioned tools through individually structured interviewing to collect the baseline data about prostate cancer as a pre-intervention assessment.

The researchers were available at the previously mentioned setting two days weekly at morning and afternoon shifts to collect baseline data. At the beginning, the researchers welcomed studied patients and gave a brief idea about the aim and activity of the program. Then, the researchers collected data using the different tools of data collection in urology departments.

The time required for finishing Structured interview questionnaire was around; 15-20 minutes. The time required for finishing Prostatic cancer preventive practices questionnaire (PCPPQ) was around; 10-15 minutes. The time required for finishing Prostatic cancer perception questionnaire was around; 5-10 minutes.

B- Planning phase:

The educational program was planned according to the studied patients' needs. The goal of the program was to enhance the studied patients' knowledge, practice, and perception regarding prostate cancer. The educational program was constructed in a form of printed Arabic booklet and included different topics to enhance the studied patients' knowledge, practice, and perception regarding prostate cancer prevention and management. Different instructional strategies, method of teaching, media and method of evaluation were selected to suit the patient's needs and achieve the objectives and introduce contents of the educational program.

C- Implementation phase:

This phase was initiated in April, 2024. The researchers visited previous mentioned settings in the two shifts (morning and afternoon), two days/week. During this phase, educational program was introduced to all studied patients during sessions. These sessions were done in the available hospital classrooms at Suez-Canal and Ain Shams University Hospitals. The studied patients were divided into subgroups. Each subgroup ranged between 2 and 4 patients if available. Each group received the same content and using the same teaching strategies; lecture with PowerPoint presentation, pictures, videos, discussion, handout (booklet), and brochure. The educational program included four sessions, each lasting between 30 to 45 minutes.

For the theoretical part; two sessions were included; **session one** "Basic information about prostate cancer" overview of the prostate gland, definition, risk factors and causes for developing prostate cancer, prostate cancer screening, signs and symptoms, diagnosis, grading scale for diagnosing prostate cancer, possible methods of treatment for prostate cancer and their side effects, Follow-up care and preventive measures. **Session two** "Preventive health practices for prostate cancer" which include benefits, importance of prostate cancer screening and preventive practices, and elements of preventive health practices for prostate cancer.

For the practical part; it was conducted through demonstration, redemonstration and real objects. It was introduced in two practical sessions as follow:

Session one: Skills to avoid getting ill or decreasing risk" including Activities to maintain physical fitness and health. The importance of activity and movement to prevent prostate cancer, ways to conserve physical

energy, important tips for exercising, perform activities of daily living and commitment to the practice of self-care.

Commitment to healthy habits: smoking cessation, the importance of vitamin D and sun exposure, having sex, rest and sleep, consultation, proper action in case of abnormal symptoms, and increasing knowledge and awareness to correct erroneous negative health ideas and beliefs. introduction to early detection of prostate cancer, factors for choosing screening for early detection of prostate cancer, the importance of early detection, screening options for early detection of prostate cancer (blood test to measure the level of prostate - specific antigen (PSA) concentration in the blood, perform a digital rectal examination to palpate the prostate, biopsy and other examinations, maintaining the periodic examination schedule for early detection and proper access to health care institutions.

Session two: included proper nutrition and its importance for the prevention of prostate cancer, commitment to a healthy diet and elements of proper healthy nutrition. Lifestyle behaviors as social communication with family and friends, linking healthy behaviors to personal goals, learn new skills that make individuals feel good and what should be avoided to prevent prostate cancer. Psychological well-being: be positive about disease prevention, self-confidence and optimism towards the future, looking at life in a positive way, trying to control oneself in the face of psychological problems and pressures, practicing relaxation exercises to reduce anxiety and stress, the relationship of anxiety, nervous tension, stress, and psychological state with prostate cancer, and ways to deal with the stresses of daily life. The implementation phase completed in a period of 8 months started at May 2024 to September, 2024

Evaluation phase:

This was the last phase, which aimed to evaluate the effect of prostatic cancer educational program on patients' health outcomes. The evaluation was conducted two times as follow: First time (immediate post-test): Immediately after application of the educational program using tools tool I (3rd part), tool II and tool III. And the second time after one-month of application of the educational program using the same tools. The time of the data collection lasted from the beginning of October , 2024 to December, 2024.

Statistical analysis

The data was checked for accuracy before being entered into a computer. The Statistical Package for Social Sciences, developed by IBM in Illinois, Chicago, USA (SPSS version 32.0), was used to analyze and tabulate the information. Descriptive statistics (numbers and percentages) are used to summarize categorical variables also, mean scores with standard deviation SD were calculated for numerical values, and the significance level was set at $p<0.05$, with a highly significant value of $p \leq 0.001$. The Anova -test (F) is used to compare means, and correlation analysis used to determine the relationship between variables. Spearman rank correlation coefficients (r) and associated p-values are used to examine the relationships between variables.

Results:

Table (1): shows that 50% of the studied patients' ages between 50-60 years old with a mean ± SD of 50.4±6.2. Regarding to the marital status, it was cleared that 63.33% of the studied patients were married. Concerning patients' educational level, it was found that 55% of the studied patients had below secondary level. In term of patients' occupations, it is clear that, 70% of the studied patients do not work. According to place of residence 61.67% of the studied patients are from rural area. Finally, 81.67 % haven't family history of prostatic cancer.

Table (2) illustrates that 75% of the studied patients have HTN and D.M. In addition, 71.67% of the studied patients reported that the onset of the disease was diagnosed from less than one year, 50% of the studied patients had onset of illness between 50-60 years old. Also, 60 % of the studied patients treated surgically, with 50% of patients are in Stage (II) of the disease.

Table (3): represents the distribution of the studied patients according to their total knowledge practice and perception scores about prostate cancer pre-, immediate post and post-one month of educational program. It demonstrates that there were a statistically significant differences related to knowledge and practices levels of the studied patients regarding prostate cancer with (P<0.001) throughout all the study phases. With the highest mean knowledge , practice and perception levels was at the immediate post phase.

Table (4) Reveals that there is a high statistically significant positive correlation between knowledge, perception, and practice at r= (0.340 & 0.289) respectively with a P value = 0.000**.

Table 5, showed statistical significant relation between the studied patients' knowledge levels and marital status and educational level. Also, there is a statistical significant relation between the patients adherence to preventive practice measures and patients' educational level,Place of residence, Family history of PC, and age. Moreover, there is a statistical significant relation between the studied patients' perception and level of education.

Table (1): Frequency and percentage distribution of the studied patients according to their personal data (N=60)

Personal data	N	%
Age category:		
- 30-39	10	16.67
- 40-49	20	33.33
- 50-60	30	50
mean ± SD	50.4±6.2	
Marital status:		
- Married	38	63.33
- Single	9	15
- Divorced	13	21.67
Level of education:		
- Below secondary level	33	55
- Secondary level or higher	27	45
Occupation:		
- Work	42	70
- Don't work	18	30
Place of residence:		
- Rural	37	61.67
- Urban	23	38.33
Family history of PC:		
- No	49	81.67
- Yes	11	18.33

Table (2): Clinical data of the studied patients (N=60)

Clinical data	N	%
Suffering of chronic disease:		
- HTN	45	75
- D.M	45	75
- Respiratory disease	20	33.33
- Kidney disease	3	5
Date of disease onset:		
- Less than one year	43	71.67
- More than one year	17	28.33
Age at onset of illness:		
- 30-39	10	16.67
- 40-49	20	33.33
- 50-60	30	50
Present treatment used		
- Chemotherapy	11	18.33
- Radiotherapy	13	21.67
- Surgical	36	60
Stage of disease:		
- Stage (I)	12	20
- Stage (II)	30	50
- Stage (III)	18	30

Table (3): Total knowledge, practice and perception levels of the studied patients about prostatic cancer (N=60)

Variables	Pretest	Immediate post	Post one month	F	P
Knowledge	Mean±SD	Mean±SD	Mean±SD		
- High	8.83±2.58	19.20±2.16	14.06±2.15	1046.98	0.000*
- Low	15.17±2.87	5.84±2.59	9.88±2.54	540.24	0.000*
Practice					
- Good	18.53±2.40	30.25±4.94	23.5±5.04	621.84	0.000*
- Poor	19.72±3.43	15.34±3.64	12.24±2.09	460.97	0.000*
Perception					
- Good	24.68±4.55	37.38±4.58	32.64±3.08	739.75	0.000*
- Poor	30.25±4.94	18.53±2.50	23.50±5.04	621.48	0.000*

Table (4): Correlation between the studied patients' total levels knowledge, practice and perception (N=60)

Variables	Satisfactory knowledge level	
	R	P
Perception	0.340	0.000*
Practice	0.289	0.000*

Table (5) Average scores of the 60 studied patients regarding knowledge, preventive practice and perception at post-test in relation to sociodemographic data

Independent variables	knowledge		F	P- value	preventive practice		F	P- value	perception		F	P- value
	Mean	SD			Mean	SD			Mean	SD		
Age category:												
- 30-39	16.58	2.44	0.586	0.618	165.14	8.23	6.444	0.001*	31.29	6.18	2.239	0.077
- 40-49	15.86	2.23			152.92	13.05			28.71	6.11		
- 50-60	15.82	2.72			156.00	14.07			28.66	5.87		
Marital status:												
- Married	13.72	2.48	3.004	0.033*	159.77	11.90	0.878	0.448	31.20	6.44	1.066	0.372
- Single	13.75	2.18			152.71	11.28			28.57	1.98		
- Divorced	15.43	1.83			161.26	11.51			31.86	4.21		
Level of education:												
- Below secondary level	13.21	2.17	26.702	0.001*	148.86	6.76	210.811	0.001*	28.45	3.12	72.717	0.000*
- Secondary level or higher	15.48	2.26			168.34	6.80			34.71	4.61		
Occupation:												
- Work	16.21	2.47	0.733	0.440	159.80	12.64	0.377	0.525	31.04	4.82	1.556	0.216
- Don't work	16.59	2.34			157.61	14.05			32.85	5.87		
Place of residence:												
- Rural	16.37	2.53	0.355	0.568	161.71	12.94	9.088	0.004*	31.83	5.19	3.694	0.058
- Urban	15.95	2.36			154.53	11.22			29.87	4.08		
Family history of PC:												
- No	14.23	2.47	0.422	0.543	158.50	10.86	9.106	0.004*	28.95	4.96	3.644	0.058
- Yes	14.53	2.34			168.90	9.064			31.91	4.19		

(*) Statistically significant at p < 0.05

Discussion:

Prostate cancer is a central health problem that was no longer sufficiently studied in Egypt, although it is one of the most important reasons of morbidity and mortality among men (**Pernar et al., 2018**). Nurses should assist patients to manage therapy side effects and deal with body image changes or any other changes in functional living and appearance. Also, evidences revealed that non-invasive interventions such counseling, and educational interventions; can play important roles in improving patients' health outcomes (**Maria Lavdaniti, 2015**).

Egypt has made significant strides in the fight against cancer, an achievement that is highly commendable. Since 2018, the country has implemented the Egypt National Multisectoral Action Plan for Prevention and Control of Noncommunicable Diseases, with the primary objective of reducing premature mortality rates by 15%. This plan is centered on mitigating risk factors, enhancing early detection, and ensuring effective treatment. To achieve these objectives; the national cancer committee has been established to develop and implement a comprehensive national plan and guidelines for cancer control and early detection, in the same line with a particular emphasis on prostate cancer Sustainable Development Goals, which seeks to reduce premature mortality from non-communicable diseases (**Egyptian Ministry of Health and Population, 2021).**

The result in the present study revealed that, half of the studied patients aged between 50-60 years old. These findings are consistent with **Hassan, Belal & Mohammed, (2021),** whose study entitled" Effect of Nursing Care Bundle on Patients Undergoing Prostatic Surgery Outcomes" and reported that around two-thirds of the studied patients their age was more than 30 years old. In addition, these findings are compatible with **Cal, Zengin, & Avci, (2018),** who conducted a study about "Needs of patients with prostate cancer for home care after surgery" and reported that; the average age of the patients admitted for prostate surgery in their study was (55.22±8.13). From the researchers' point of view, this may reflect that the prostate cancer is most common among old age men.

In the light of marital status, the finding of the current study clarified that, nearly two-thirds of the studied patients were married. The study finding was supported by **Gomaa et al. (2022),** who conducted a study in Egypt entitled " Effect of Mobile-based Mindfulness intervention on stress, pain, and quality of life among patients with Prostate Cancer" and stated that less than three-quarters of patients were married. Also, this study in a congruent with **Metwaly, & Hamad, (2019),** who conducted a study about the effect of palliative care program on the nurses' performance regarding prostate cancer and patients' outcomes, and discovered that most of patients were married.

On the other hand; this finding was contradicted with **Tyson et al. (2013),** in a study titled "Marital status and prostate cancer outcomes" and discovered that unmarried men have a greater risk of prostate cancer-specific mortality compared to married men of similar age, race, stage, and tumor grade. From the researchers' point of view, this may be due to stressful life experiences they faced which may be risk for cancer development.

In concern to the level of education, the present study results showed that more than half of the studied patients had below secondary level of education. This finding was corresponding with **Metwaly, & Hamad, (2019)**, who stated that half of patients had an intermediate level of education. As well, this result is similar to **Cal et al. (2018)**, who indicated that nearly less than half of the studied patients had intermediate level of education. This study finding is contradicted with **Hassan, Belal & Mohammed, (2021)**, study whom clarified that all of the studied patients were highly educated.

With reference to occupation, the current study finding demonstrated that nearly three-quarters of the studied patients were worked. This finding is in agreement with **Hassan, Belal & Mohammed, (2021),** who revealed that all of the studied patients were worked. This finding goes in the opposite line with **Huen et al. (2019)**, whose study entitled "Outcomes of an integrated urology care clinic for patients with

advanced urological cancers: maintenance of quality of life and satisfaction and high rate of hospice utilization through end of life" and demonstrated that most of the studied patients were not worked.

In the context of the place of residence, the present study indicated that more than half of the studied patients are from rural area. These results go in the same line with a study conducted by **Gomaa et al. (2022)**, who mentioned that fewer than three-quarters of the participants living in rural areas.

Regarding family history, the current study found that more than one-quarter of the studied patients have not a family history of prostatic cancer. These findings were congruent with **Atia, & Soliman, (2018)**, whose study entitled "Effectiveness of Psycho- Educational Program on Quality of Life and Body Image of Prostatic Cancer Patients", who confirmed that more than three-quarters of studied patients hadn't family history of prostatic cancer.

In contrary, with **Sharma et al. (2016)**, who study titled "Prostate, farming and other risk factors: A mini review", and asserted that there was clear association between a family history of prostate cancer and increased risk of developing the disease. From the researchers' point of view, this could be due to small sample size as well as the exposure to stressful situations, greater economic and social burden of disease, in addition to elevated fees of care .

Concerning suffering of chronic diseases, the existing study found that three-quarters of the studied patients had health problem as HTN, and D.M. Result of this study corroborated with the findings of **Atia, & Soliman, (2018)**, who concluded that one-third of studied patients had health problem as hypertension, diabetes mellitus and other health problems. Furthermore, this conclusion has been proven by **Liang et al. (2016),** who conducted a systematic review and meta-analysis research titled "Hypertension and risk of prostate cancer " and indicated that hypertension may be associated with an accelerated risk of prostate cancer.

Regarding the total knowledge level; the current study found that, there was a statistically significant difference for the studied patients regarding knowledge levels immediate post and post-one month of the educational program implementation. This result was corresponding with finding of **El mezayen et al. (2022)**, whose researched "The Effect of Educational Program on Knowledge and Commitment of Male Employees at Tanta University Regarding Prostate Cancer Screening" and published that there was a significant improvement in the total knowledge score of the studied employees throughout the study phases.

These results are consistent with finding of many studies include **Keane, (2015) & Ivlev et al. (2018**), as these study results showed that the educational program significantly improved cancer-related knowledge. The systematic education which included a combination of verbal information, booklet and brochure help improve patients' knowledge. The educational program language and content is appropriate to the individual in terms of gender, age, culture, and other socioeconomic factors. The previous factors have an important impact on the ability of individuals to learn. In addition, the using of individualized discussion after the application of the educational program and giving written information may have contributed to the success of the intervention.

The present study finding was supported by **Cowman et al. (2021)**, who conducted a study entitled " Knowledge and attitudes of men toward prostate cancer in Bahrain" ; mentioned that most of the studied patients had poor knowledge about the disease and recommended performing an educational program to improve their knowledge. Moreover, the outcome supported the study by **Micaux, (2021)**, whose study entitled "Web-based support for young adults with reproductive concerns following cancer" reported an improvement in the total knowledge score after the intervention program with statistical significant difference. From the researchers' point of view, this result might be due to that most patients should become aware of the disease risks and know how to deal with the disease to preserve their life.

Moreover, the current study found a statistically significant difference regarding

preventive practice levels and perception level toward PC management at the immediate post compared with post-one month of the educational program implementation. This result was corresponding with finding of **Khalil et al. (2024)**, whose research titled " Effect of health belief model-based educational intervention on prostate cancer prevention; knowledge, practices, and intentions" and found a significant improvement in the total preventive practice score of the studied patients throughout the study phases.

Additionally, these findings were supported by **Mazloomi, Dehghan and Dehghan (2017),** whose research titled " Effect of education on preventive treatment of prostate cancer in men over 40 years on the health belief model " and suggested that; raising men over 40 years of awareness via health belief model (HBM) education can predispose them to more effective preventive practices; where significant differences in knowledge and practices mean scores were identified between their study participants before and after the intervention implementation. Also, **Fouad, & Gomaa, (2018),** who studied "Prostate cancer Program for Elderly Men Perception" illustrated that there was a significant increase in susceptibility perception in post-program implementation than pre-program implementation phase.

This study showed statistical significant relation between the studied patients' knowledge levels and marital status and educational level. Also, there is a statistical significant relation between the patients adherence to preventive practice measures and patients' educational level,Place of residence, Family history of PC, and age. Moreover, there is a statistical significant relation between the studied patients' perception and level of education. The present study results are consistent with results of **khalil et al. (2024).** the researchers think that these results may be due to the effect of personal life and educational levels on the individuals' knowledge, practice and perception.

Conclusion:

Implementing the educational program for patients with prostatic cancer significantly improved the health outcomes of the participated patients, as evidenced by increased knowledge level about the disease, enhanced adherence to preventive behavioral practices to control the disease and prevent complications, and improve perception toward the disease management.

Recommendations:

Based on the finding of the present research, it is recommended to:

- Develop and implement educational programs that cover all aspects of prostate cancer, including prevention, early detection, treatment options, and survivor-ship care.
- Design educational interventions based on the Health Belief Model to improve knowledge, perceptions, and preventive practices.
- Utilize online platforms include videos and interactive modules to deliver educational content, making it more accessible to patients who may have difficulty attending in-person sessions.
- Identify and address common barriers to prostate cancer screening, such as financial issues, lack of health insurance, and cultural misconceptions.

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