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Effect of structured teaching program on stress and caregivers' burden of adult and elderly patients with bladder cancer

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***Abstract*---Background**: Bladder cancer ranks globally as the seventh most prevalent cancer. The adverse impact experienced by caregivers, such as cancer caring burden, reduced free time, and insufficient rest time, could bring both physical and psychological burdens to cancer caregivers. Therefore, t**he study aimed to** determine the effect of structured teaching program on stress and caregivers' burden of adult and elderly patients with bladder cancer. **Design**: To conduct this study a quasi-experimental design (pre and post-test one group) was utilized. **Setting**: This study was conducted in a urology outpatient clinic at the oncology institution Sohag City. **Subject**: A convenient

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sample of 100 (50 bladder cancer patients and 50 of their caregivers) were enrolled in the current study. **Data collection tools: Tool I:** Participants' demographic and disease-related characteristics assessment sheet, **Tool II:** Caregiver's knowledge about bladder cancer, Tool **III:** Caregivers' reported practices about bladder cancer**,** **Tool IV:** Perceived Stress Scale-10 (PSS-10), and **Tool V:** Zarit Caregiver Burden Interview (ZBI). **Results**: The current study showed that, following instructional guidelines implementation, knowledge, practices, caregiver burdens, and Perceived Stress ' mean scores were improved with statistically significantly differences. Additionally, the results indicated that total and subscale scores of caregiver burden were negatively correlated with Perceived Stress. **Conclusion**: The structured teaching program has a positive effect on improving knowledge and practices among caregivers of patients having bladder cancer. Similarly, statistically significant reduction of caregiver burdens associated with caring for patients having b laddercancer with reducing in their perceived stress level. **Recommendations**: Caregiver adaptation to caregiving processes should be continuously evaluated, and caregivers should be informed about the possible load and consequences of providing care to protect them from experiencing negative physiological or psychological effects.

***Keywords*---**Adult and elderly patients, Bladder cancer, Caregivers burden, Stress, Structured teaching program.

Introduction

Cancer encompasses a range of diseases characterized by the uncontrolled growth and spread of abnormal cells, which can be lethal if not addressed. Numerous factors contribute to the increased risk of developing various cancers, including modifiable elements like tobacco use and obesity, as well as non-modifiable factors such as genetic predispositions, even when the precise cause remains unclear. These risk factors may act either sequentially or simultaneously to initiate and/or promote cancer progression (**Jubber et al., 202**2).

Bladder cancer ranks as the fifth most prevalent cancer globally. The optimal treatment for muscle-invasive bladder cancers (MIBC) is urinary diversion (UD), typically performed through ileal conduit (IC) surgery in conjunction with radical cystectomy (RC). Patients with bladder cancer face daily challenges in managing an ostomy, which can adversely affect their mental well-being. Inadequate preparation for post-ostomy care can detrimentally influence post-operative quality of life by increasing clinic visits, creating stoma-related issues, and complicating the management of negative body image. For patients with MIBC, the combination of RC and UD yields a significant 5-year cancer-specific survival (CSS) rate of up to 76% (v**an Hoogstraten et al., 2022).**

In the last thirty years, years lived with disability (YLDs) have also risen. The increasing population of individuals with urine diversion underscores the necessity to enhance post-ostomy quality of life, considering these YLD statistics.

Family caregivers play a crucial role in the healthcare triad for bladder cancer patients undergoing RC with UD, sharing the substantial burden alongside ostomy patients and their medical/nursing care (**Elsayed et al., 2019).**

Beyond managing cancer-related tasks, these caregivers also offer essential ostomy care assistance, which includes nursing responsibilities, appointment scheduling, addressing challenges, and providing emotional support. Their responsibilities are further complicated by financial pressures, including medical costs and potential disruptions to employment. According to research, family caregivers frequently have a lower quality of life, which affects the patients they care for's quality of life in terms of their health. As seen in other chronic diseases, putting family caregivers' well-being first may therefore enhance these patients' long-term health-related quality of life (**Tran et al., 2021)** .

Caregivers are individuals who provide unpaid assistance to friends, relatives, or life partners who are ill, whether they are patients or disabled. According to **Adib-Hajbaghery & Ahmadi (2019),** the concept of core burden refers to the negative effects that caring for individuals with disabilities has on a family caregiver's activities (objective burden) or emotions (subjective burden) related to their emotional, physical, social, and financial well-being. The act of caregiving significantly influences public health, affecting the quality of life for millions of individuals. Family caregivers offer social or medical support to other family members. This support may include assistance with one or more daily living activities, such as dressing and bathing, managing bills, shopping, and providing transportation. Emotional support and help in managing a chronic illness or disability may also be included. As the needs of the recipient increase, the range of caregiving responsibilities may also evolve, which can place additional stress on the caregiver **(Weis et al., 2021).**

Patients, families, and society are all profoundly affected by bladder cancer. Beyond the psycho-social burden, bladder cancer also carries a considerable financial burden, which is evident in the costs associated with the healthcare system and the allocation of resources for treatment. The disease and its treatment significantly influence a person's baseline functioning across various domains in relation to cancer. Severe symptoms such as pain, fatigue, altered body image, and reduced physical function are commonly associated with cancer and its treatments, including chemotherapy and radiation. This can have a profound effect on patients' overall health and quality of life. Moreover, a cancer diagnosis is often associated with increased levels of anxiety and depression. These mental health challenges can exacerbate pain perception and diminish overall quality of life. Furthermore, patients may experience social isolation due to their illness or the side effects of medication, which can adversely affect their social interactions and relationships. Additionally, the financial burden of cancer treatment can greatly impact patients' quality of life, leading to significant economic stress. Financial toxicity encompasses both direct costs, such as medical expenses, and indirect costs, such as lost income (Caruso, 2018).

Caregiver burden refers to the various forms of stress and hardship that caregivers endure while providing long-term care for a loved one. The negative consequences for caregivers, including the responsibility of caring for someone with cancer, reduced leisure time, and insufficient sleep, can lead to both physical and mental strain. In fact, the caregiver burden is often greater for family members of individuals diagnosed with colorectal cancer **(Ong et al., 2018)**. Recent studies indicate that family caregivers of colorectal cancer patients frequently face a range of burdens, including role conflict, emotional strain, and time-related challenges, as well as physical symptoms such as fatigue and sleep disturbances, along with psychological issues like anxiety, depression, and guilt **(Mohamed et al., 2021).**

The American gerontologist, Zarit, was the first to characterize the burden of care as "the discomfort experienced by the primary caregiver of a family member, encompassing the caregiver's health, psychological and emotional well-being, financial situation, and social life." Caregiver burden is described as "emotional, social, and financial stress on patients" **(Yaşar & Terzioğlu, 2022).** Alternatively, it can be viewed as a "multidimensional biopsychosocial reaction resulting from imbalances imposed by official care sources on caregivers' time, social roles, physical and emotional well-being, economic resources, and various other responsibilities they undertake" **(Zuo et al., 2020).** The psychosocial stress highlighted in the definition of caregiver burden suggests a potential link to the concept of quality of life, which encompasses both physical and psychosocial elements. Research has indicated that the quality of life for caregivers is adversely affected during the caregiving process for cancer patients **(Rasul & Amen et al., 2022).**

The entire life of a family is influenced by the diagnosis and treatment of cancer. Chronic physiological, psychological, and social stress can lead to family crises, reduced intimacy, and conflicts among family members. A caregiver who is overwhelmed is more likely to experience family maladjustment, and numerous studies have shown that the pressure on caregivers negatively impacts family resilience **(Zhang et al., 2022).** This significantly affects the daily lives and employment of caregivers **(Gray et al., 2020).**

The financial burden of therapy may fall on caregivers, and loss or delay in work can lead to increased financial strain. According to various studies, caregivers of patients with colorectal cancer currently experience a moderate burden. **Shaffer et al. (2019)** noted that the burden of caring for patients with colorectal cancer is influenced by two main factors. Firstly, caregivers are affected by issues related to the patient. The study's findings suggest that while caregivers of patients facing challenges endure a greater care burden, those who are female , younger and more educated had a lower psychological burden (**Kim et al., 2014**). Second, the care burden is influenced by the caregivers' psychological status and self-efficacy; older, female, employed, and less educated caregivers bear a greater burden, as do caregivers with psychological barriers and low self-efficacy (**Wadhwa et al., 2019).**

Nurses play a crucial role in assisting caregivers to participate in support groups. Such groups can provide problem-solving strategies for difficult situations, along with encouragement and validation, as fellow members understand the challenges you may face and create an ideal environment for building strong connections. Seek social support and strive to keep in touch with loved ones who can offer nonjudgmental emotional assistance. Plan a weekly activity to connect, even if it is simply taking a walk with a friend (**Wong et al., 2021)**.

Significance of the Study

Bladder cancer which accounts for over 7,900 fatalities annually and accounts for around 16% of all male cancers, is one of the most prevalent cancers in Egypt. With an estimated 573,000 new cases in 2020, Bladder cancer is the seventh most frequent malignancy worldwide. In 2020, BC was the 13th most common cause of cancer-related death (and the ninth among men), accounting for over 213,000 deaths. It is anticipated that the number of new Bladder cancer cases will rise by 72.8% by 2040, reaching 991,000 individuals diagnosed globally. Furthermore, it was projected that the number of BC fatalities will rise from 213,000 in 2020 to 397,000 in 2040, an increase of around 86.6% (**Bedwani et al., 2021**).

As the main caregivers, spouses hold the responsibility of addressing the daily living needs, illness care, and emotional support requirements of the patient, while simultaneously managing other family and social obligations. Nevertheless, the overwhelming caregiving demands can lead to the neglect of their own physical and psychological well-being, rendering them more vulnerable to health issues such as fatigue, anxiety, and stress compared to the patients themselves. This situation generates a caregiver burden that culminates in physical, psychological, emotional, and financial detriments linked to the act of providing care (**Saji et al., 2021**). Hence, the study was done to determine the effect of structured teaching program on stress and caregivers' burden of adult and elderly patients with bladder cancer.

Aim of the study:

The study aimed to determine the effect of structured teaching program on stress and caregivers' burden of adult and elderly patients with bladder cancer.

Hypothesis:

H1: Caregivers' knowledge and reported practices for patients with bladder cancer expected to improve post- structured teaching program implementation than pre-implementation.

H2: Caregivers' burden level caring for patients with bladder cancer expected to be decrease post-structured teaching program implementation than pre-implementation.

H3: Caregivers' stress level caring for patients with bladder cancer expected to reduce post- structured teaching program implementation than pre-implementation.

Subjects and Methods

Research Design:

To conduct this study a quasi-experimental design (pre and post-test one group) was utilized

Setting:

This study was conducted in a urology outpatient clinic at the oncology institution Sohag City

Subjects:

A convenient sample of 100 (50 bladder cancer patients and 50 of their caregivers) were enrolled in the current study.

Data collection tools:

Tool I: Participants' demographic and disease-related characteristics assessment sheet: it included data such as (gender, age, education level, and residence), Time since diagnosis (Months), Cancer stage, and received treatment.

Tool II: Caregiver's knowledge about bladder cancer: It was created by the researchers based on a literature review (**Bedwani et al., 2021; Wong et al., 2021)** and written in simple Arabic language. It was created to evaluate the caregiver's knowledge of with bladder cancer disease and consists of 18 items: meaning, symptoms, causes, high risk, methods to bladder cancer detection, types of cancer, prevention, and information sources.

Scoring system:

Correct answers received a score of (2), while correct and incomplete answers received a score of (0). The sum of the item scores was divided by the number of items and the total knowledge scores were deemed satisfactory if the score were > or equals 60% and considered unsatisfactory if the score were < 60%.

Tool III: Caregivers' reported practices about bladder cancer:

It was developed by the researchers based on a literature review (**Yigitalp et al., 2017; Bedwani et al., 2021)** and written in simple Arabic language. Using 9 questions that were divided into 3 categories of bladder cancer patient follow-up, ostomy of patients with bladder cancer, administering medication, and screening to patients.

Scoring system of caregivers' reported practices:

There are two response levels for each step: completed and unfinished. For each of these, the scores were 1, 0. When the score was greater than or equal to 60 %, the total reported procedures were deemed adequate; when it was less than 60 %, they were deemed inadequate.

Tool IV: Perceived Stress Scale-10 (PSS-10):

The tool known as the Perceived Stress Scale-10 (PSS10) was adapted from **Cohen et al. (1983**). It is a ten-item self-report measure designed to assess an individual's degree of stress. The nurses are asked to rank their thoughts and feelings from the previous month. The graded of each item on a five-point scale that went from never (0) to very often (4). Consequently, the scores of each patient varied from 0 to 40. Higher reported stress levels were reflected by higher scores.

Scoring system:

Low levels of stress were indicated by PSS-10 scores between 0 and 13, moderate levels by scores between 14 and 26, and severe levels by scores of 27 or higher. Items 4, 5, 7, and 8 were the four that used reverse scoring. The PSS was correlated with measures of anxiety, sadness, helplessness, and disease activity to achieve convergent validity. There was 0.78 internal consistency on the scale.

Tool V: Zarit Caregiver Burden Interview (ZBI):

The Zarit Caregiver Burden Interview (ZBI) was created in 1980 by **Zarit and Zarit (1990**). Inci and Erdem conducted a validity and reliability study of its Turkish version in 2008, and the Cronbach Alpha Value is between 0.87 and 0.99. It is a structured questionnaire (interviewer-administered) that functions as a rating scale. It measures the impact of caregiving on an individual's life and consists of 22 statements. It is a Likert type scale that rates on a scale of 0 to 4 points, with 0 representing "never," "rarely," "sometimes," "frequently," and "always." The scale's lowest score is 0 and the highest is 88. The items are primarily focused on the social and emotional domains, and a score of 0–20 indicates "no care burden.", 21- 40 “low care burden”, 41-60 “medium care burden “ and 61-88 means “heavy care burden” (**Inci & Erdem, 2008**).

Validity and reliability of tools: Five **professors in Medical- surgical nursing field and two professors; in the Psychiatric nursing field**medical-surgical nursing, education, and community health nursing experts evaluated the instruments for comprehensiveness, applicability, clarity, relevance, and comprehension to conduct content validity. No changes were made when needed. Using the Cronbach's alpha test, reliability was assessed; it was 0.931 for knowledge, 0.933 for practices, 0.879 for stress scale, and 0.879 for burden of care.

Pilot Study:

Ten caregivers and patients with bladder cancer, or 10 % of the sample, participated in a pilot study to make sure the questions were clear, the instruments were applicable, and the time required to complete them was adequate. No ambiguous statements or questions were present, and no changes were made. Pilot study was included in the study.

Ethical Considerations:

This study was approved by the Sohag University Faculty of Nursing's Ethical Scientific Research Committee. After being informed of the study's goals and advantages, caregivers of patients with bladder cancer verbally consented to take part. In accordance with ethics, values, cultures, and beliefs, participants were granted the freedom to leave the study at any moment, and confidentiality and anonymity were upheld.

Field work:

The purpose of the study was explained, and each caregivers of patients with bladder cancer was interviewed after giving their informed consent to take part. The researchers established the educational instructions in a clear, Arabic language after studying relevant literature and making revisions and modifications based on expert feedback. A pilot study was conducted to see whether the questions were straightforward and unambiguous. The data was gathered for two hours every day, three days a week, from the beginning of June to the end of November 2021.

Construction of the structured teaching program:
Four phases make up the current study: assessment, planning, implementation, and evaluation.

Assessment stage: pre-assessment tools were completed. This stage used to collect information from caregivers of patients with bladder cancer.

Planning stage:
As a consequence of the pre- structured teaching program assessment, literature study, researcher experience, and the perspectives of nursing and medical experts, the structured teaching program were developed.

The general objective of the structured teaching program was to reduce the caregivers' burden of care and enhance their reported practices, knowledge, and improve their stress level.

Structured teaching program contents: The structured teaching program' content was developed to meet the needs of caregivers and to match their level of interest and comprehension. These included:

Knowledge about bladder cancer disease
- Meaning
- Symptoms
- The causes
- High risk
- Methods to bladder cancer detection
- Types of cancer
- Prevention

Reported practices among caregivers of patients with bladder cancer
- Bladder cancer patient follow-up
- Ostomy care of patients with bladder cancer
- Administering medication
- Screening to patients

Specific objectives of the awareness program:

- Define bladder cancer disease.
- Identify the causes of bladder cancer disease.
- Enumerate the risk factors of bladder cancer disease.
- List the signs & symptoms of bladder cancer disease
- Identify the types of bladder cancer disease.
- Discuss the methods of bladder cancer disease detection
- Know the prevention of bladder cancer disease.
- Discuss Bladder cancer patient follow-up.
- List types of exercises that can be used to manage the stress among caregivers.
- Apply ostomy care of patients with bladder cancer
- Know Administering medication
- Know Screening to patients

Implementation stage:

- Three theoretical and two practical sessions, each lasting thirty minutes, were used to discuss the structured teaching program with caregivers. The researchers have one-to-one meetings with each caregiver.
- In addition to caregivers completing the study materials, the first session included an explanation of the structured teaching program and their purpose. In the first session, interviews with patients with bladder cancer conducted to gather demographic information and related health history.
- In the second session; Meaning, Symptoms, The causes, and High risk was covered.
- In the third session Methods to bladder cancer detection, Types of cancer, and Prevention was covered.
- In the fourth session bladder cancer patient follow-up and ostomy care of patients with bladder cancer was covered.

In the fifth session Administering medication and Screening to patients, Exercise can reduce stress such as:

1-Yoga or Tai Chi,

Tai Chi is a form of moving meditation centered on the circulation of "chi," the life force that the ancient Chinese thought was stopped when illness existed. It is made up of motions that flow continuously. Yoga is a form of exercise that has its roots in ancient India. Its goal is to unite the mind, body, and soul. The poses can be held still or flowed through. Both can reduce the symptoms of Parkinson's disease by promoting relaxation. Other advantages consist of:

- Sharper awareness of movements and activities;
- Improved awareness of appropriate body alignment and posture; and
- Enhanced flexibility.
- Better breath support and control; enhanced core strength and balance, which lower the risk of falls;

2-Breathing Exercises,

In stressful or anxious situations, breathing exercises provide an easy and powerful approach to de-stress. A condition of great physical arousal is experienced by the body during times of stress. An elevated heart rate, tense muscles, or shallow breathing could be observed.

3-minute Relaxation Routine,

- Pick a crucial term, such as "calm," "relax," or "peace."
- Use your keyword to focus on unwinding. Be mindful of your breathing. Breathe deeply for a moment, then hold it.
- Tension your face, arms, or legs, or any other group of muscles, while holding your breath.
- Let go and relax the stiff muscles as you exhale. As you let go, keep repeating your key phrase.
- For three minutes, repeat with a different muscle group each time.

4-Consider Massage Therapy,

Many individuals who have Parkinson's disease are aware of the advantages of massage. Numerous local malls are among the locations where massages are offered. Certain advantages could be less stiffness and trembling; better sleep; more endurance throughout the day; less anxiety; and a stronger sense of calm.

Meditation

A variety of methods are used in meditation to help people calm their minds and turn inside. Not only may meditation be used to reduce stress in a variety of circumstances, but it has also been applied to Parkinson's disease.

During mindfulness meditation, an individual maintains a concentrated awareness of their thoughts, feelings, physical sensations, and the environment. A few small-scale clinical research have looked into whether practicing mindfulness reduces both the motor and non-motor symptoms of Parkinson's disease. There are some indications that mindfulness can, over time, reduce stress and promote healthy behaviors, despite the inconsistent results.

- Printed colorful materials and handouts with the structured teaching program were distributed to caregivers.
- A summary of the previous session's topics was given at the start of each one.

Evaluation stage:

The effect of structured teaching program on stress and caregivers' burden of adult and elderly patients with bladder cancer was re-assessed using the same data collection tools after one month of completion the structured teaching program.

Statistical analysis

The collected data were examined before being entered into a computer and the Statistical Package for Social Science (SPSS) version 20 was used to conduct statistical analysis. The data was displayed in tables using the t-test, Chi-square, number, percentage distribution, mean, and standard deviation. P-value is considered significant if it is equal or less than 0.05 and very significant if P-Value is 0.001.

Results:

Table (1): portrays that; 68 % of the studied patients were male and 60 % their ages were ≥ 60 years old. Regarding Time since diagnosis (Months, it was observed that 60% of the patients in the study had the disease from < 6. Concerning Cancer stage, it was noticed that 42% were in stage III and 48% of them had Surgery + Chemotherapy + Targeted therapy as received treatment for cancer.

Table (2): Shows that 62% of the caregivers in the study their ages were ≥ 30, 58% were female, 56% had a Basic education, 86% of them were from rural areas, and 46% were employed.

Figure (1): Illustrates that the main source of knowledge among caregivers caring for patients with bladder cancer was doctors (78%).

Table (2): Represents that there was improvement in caregivers' total knowledge mean scores with a statistically significant difference detected between **caregivers'** knowledge mean scores post-structured teaching program than pre-structured teaching program at P value < 0.001

Figure (2): Shows that the total knowledge level of the studied caregivers has improved post structured teaching program **about** bladder cancer and also illustrated, that 20% of them had a satisfactory level of knowledge of pre- structured teaching program that improved to 90% post- structured teaching program

Table (3): Illustrates that there was a highly statistically significant difference between caregivers' practice caring for patients with bladder cancer **pre- and post-** structured teaching program a p-value <0.001. Where there was improvement in **caregivers' total** practice mean scores.

Figure (3): Shows that 16% of the studied caregivers had adequate reported practice pre- structured teaching program that improved post- structured teaching program among (88%) of the studied caregivers.

Table 5 shows that in the pretest, the majority of studied Caregivers (70%) had high perceived stress, and (30%) had moderate levels of stress. In the post-test, the majority of them (88%) their stress levels and had low stress, and (12%) had moderate levels of stress with A significant decrease and improvement detected pre and post-program **application**.

Table 6 shows that in the pretest, the mean and standard deviation of the level of stress among studied caregivers is 32.77±4.33. In the post-**application**, the mean and standard deviation of the level of stress among them is 12.31±2.22 with a highly statistically significant difference found pre and post-awareness program **application.**

Figure 4 predicts that there was a significant reduction in the level of stress among the studied caregivers post-awareness program application. The assessment of the post-test stress level displays that (72%) had a mild level of stress, (28%) had a moderate stress level, and none had severe stress.

Table (7) and Figure (5): Illustrates that there is a highly statistically significant difference between caregivers' ZBI score means caring for patients with bladder cancer **pre and post-** structured teaching program a p-value <0.001. Where there was reduction in **caregivers**' ZBI mean scores where 17% had "no" care burden pre - structured teaching program which increased to be 30% post- structured teaching program.

Table (8) illustrates a statistically significant correlation between total knowledge, total practices, stress, and total burden of care among caregivers of patients with bladder cancer, pre and post structured teaching program.

Table (1): Patients' demographic and disease-related characteristics (n=50).

Items		**No**	**%**
Gender			
	Male	34	68
	Female	16	32
Age			
	<60	20	40
	≥ 60	30	60
Time since diagnosis (Months	<6	**28**	**56**
	6~	**14**	**28**
	≥12	**8**	**16**
Cancer stage	I	4	8
	II	13	26
	III	**21**	**42**
	IV	12	24
Received treatment	Surgery + Chemotherapy + Targeted therapy	24	48
	Surgery + Chemotherapy	10	20
	Chemotherapy + Targeted therapy	11	22
	Others	**5**	**10**

Table (2): Caregivers' demographic characteristics (n=50).

Demographic data	**(Caregivers' Characteristics)**	
	No	**%**
Gender		
Male	21	42
Female	29	58
Age		
<30	19	38
≥ 30	31	62
Residence		
Rural	43	86
Urban	7	14
Educational level		

Demographic data	**(Caregivers' Characteristics)**	
	No	**%**
Illiterate	8	16
Basic education	28	56
Secondary education	10	20
University education	4	8
Working		
Not work	22	44
Employee	23	46
Farmer	5	10

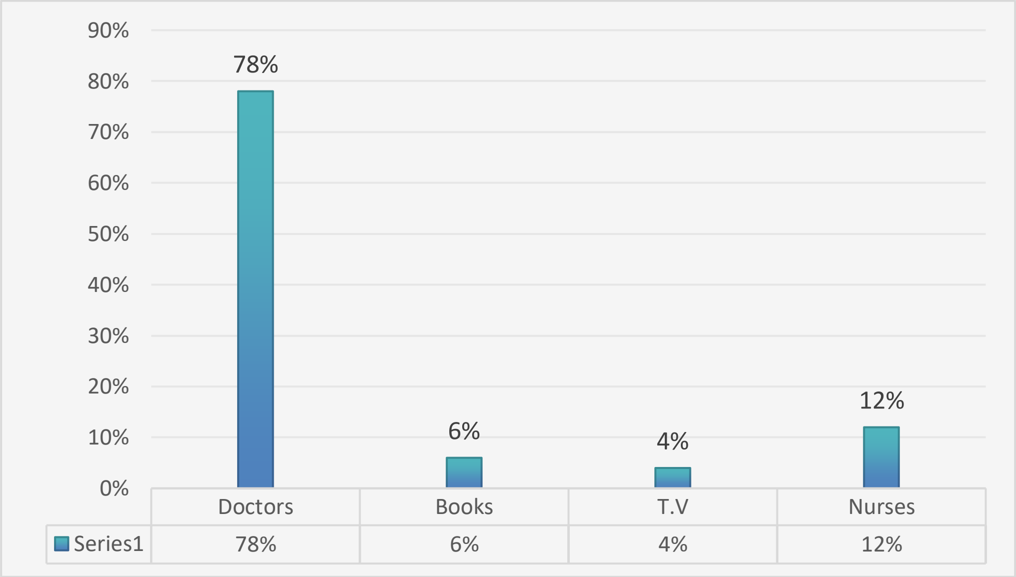

Figure (1): Source of knowledge among caregivers caring for patients with bladder cancer

Table (3): Total mean scores of caregivers' knowledge with bladder cancer pre and post-structured teaching program (n=50)

Caregivers' knowledge	**Prestructured - teaching program**	**Post structured - teaching program**	**P-value**	**t-test**
Knowledge Mean Score	9.24±1.56	16.23±1.34	<0.001**	67.21

*- independent t-test ** Significant difference at p. value<0.01*

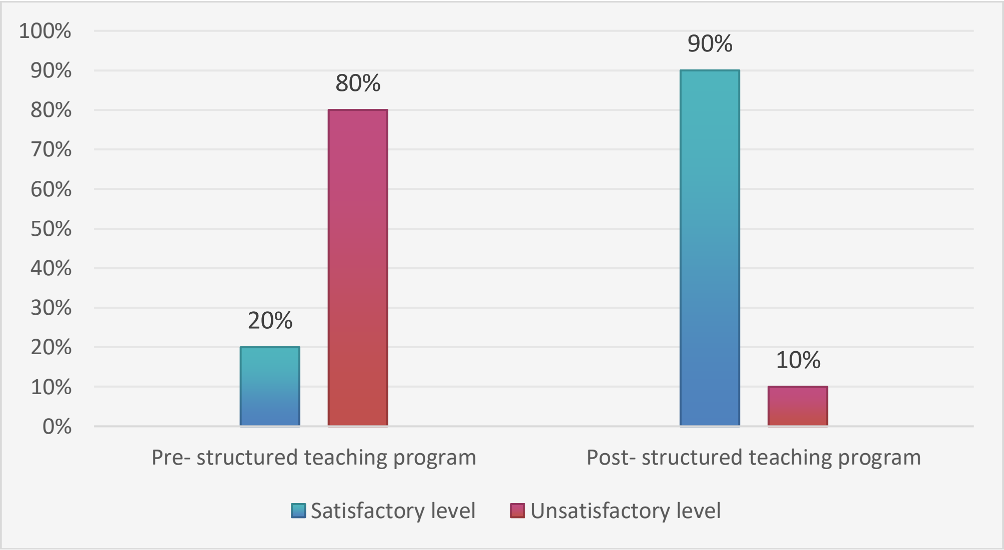

Figure (2): Caregivers total knowledge levels caring for patients with bladder cancer pre and post- structured teaching program (n=50).

Table (4): Total mean scores of caregivers' practices caring for patients with bladder cancer pre and post- structured teaching program **(n=50)**

Caregivers' practices	**Prestructured - teaching program**	**Post structured - teaching program**	**P-value**	**t-test**
Practices Mean Score	5.13±1.21	8.04±1.22	<0.001**	45.32

*- independent t-test ** Significant difference at p. value<0.01*

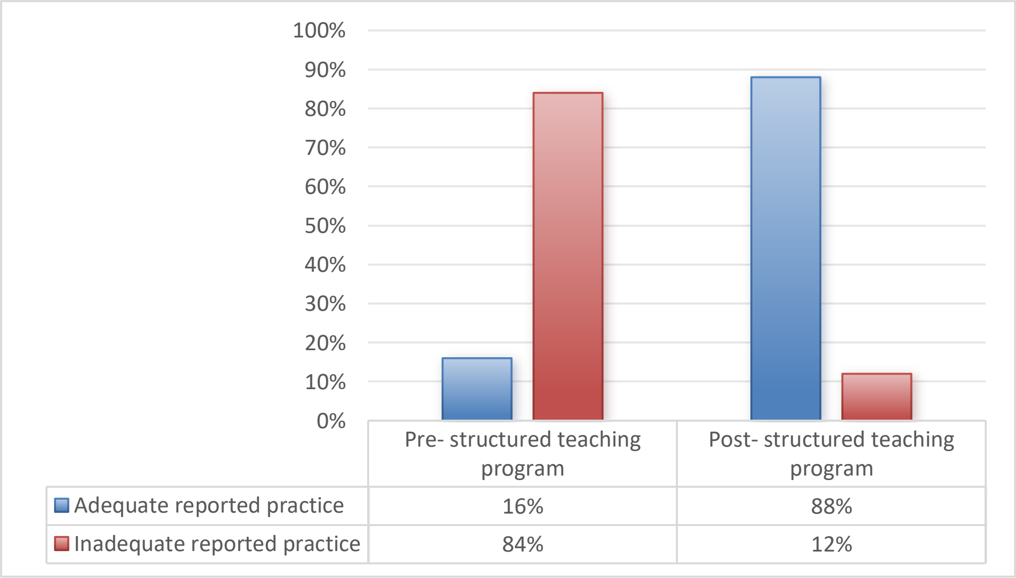

Figure (3): Caregivers total practices levels caring for patients with bladder cancer pre and post- structured teaching program (n=50).

Table 5: Differences between the stress levels among the studied caregivers pre and post-structured teaching program (n=50)

Level of Stress	Prestructured teaching program		Post structured teaching program		P –value
	No	(%)	No	(%)	
Low Stress	0	0	44	88	<0.001*
Moderate Stress	15	30	6	12	
High Perceived Stress	35	70	0	0	

Table 6: Differences between the stress levels mean scores among the studied Caregivers pre and post-structured teaching program application (n=50)

Items	Prestructured teaching program	Post structured teaching program	P –value
	Mean Standard deviation	Mean Standard deviation	
Stress mean scores	32.77±4.33	12.31±2.22	<0.001*

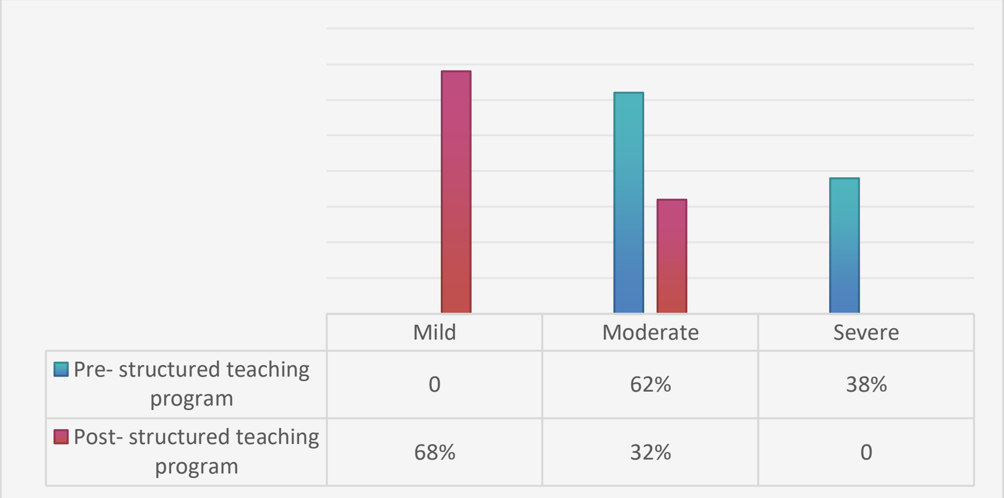

Figure 4: Total stress levels among the studied Caregivers pre and post-structured teaching program application (n=50)

Table 7. The Mean ZBI Scores of the Caregivers caring for patients with bladder cancer pre and post-structured teaching program (n=50).

Care Burden	Range	Prestructured teaching program		Post structured teaching program		P-value
		n	%	n	%	
No care burden	0-20	9	18	18	36	<0.001
Mild care burden	21-40	11	22	23	46	
Medium care burden	41-60	19	38	7	14	
Heavy care burden	61-88	11	22	2	4	

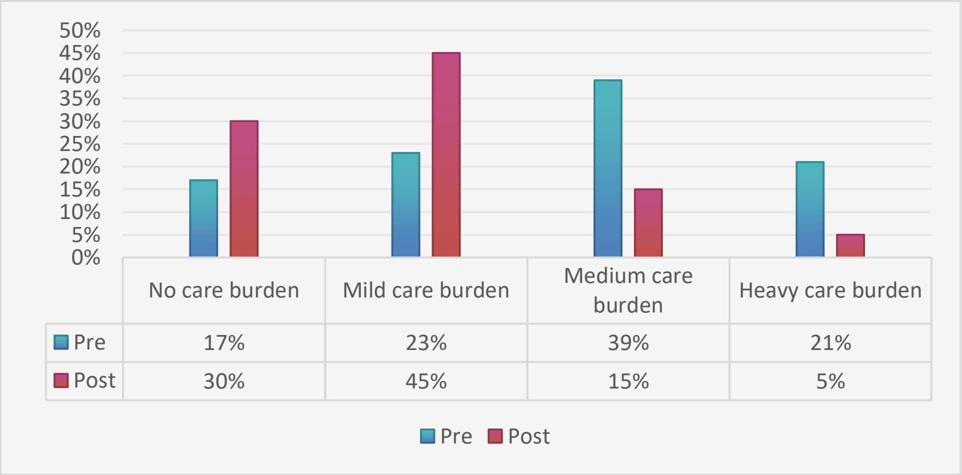

Figure (5): Total burden level among caregivers caring for patients with bladder cancer pre and post-structured teaching program (n=50)

Table (8): Correlation matrix between total knowledge, total practices, stress, and total burden of care among caregivers caring for patients with bladder cancer pre and post-structured teaching program (n=50)

Items		**Pre**				**Post**			
		Total knowledge	**Total practices**	**Stress**	**Total burden of care**	**Total knowledge**	**Total practices**	**Stress**	**Total burden of care**
Total knowledge	r	1	.147	.157	-.639	1	.079	1	.519
	p-value		.059	.079	.001**		.259		.001**
Total practices	r	.148	1	1	.319	.079	1	.137	.749
	p-value	.059			.001**	.259		.059	.024*
Total burden	r	-.637	.327	.359	1	.517	.736	.659	1
	p-value	.001**	.001**	.001**		.001**	.025*	.001**	
Stress	r	-.637	.327	1	.322	.517	.735	1	.327
	p-value	.001**	.001**		.001**	.001**	.025*		.001**

***Highly significant P<0.001*

Discussion:

Cancer is identified as the third leading cause of death worldwide, with an increasing number of patients. Although the utilization of the latest technology has led to better prognoses, further efforts are necessary. This situation causes distress not only for the patients but also for their caregivers and family members. It is essential for cancer patients and their caregivers to receive education on managing symptoms and coping with the disease **(WHO, 2021).**

The emotional, social, and financial well-being of a family member of a cancer patient is adversely affected. Numerous countries uphold strong familial bonds and traditions. Consequently, family members experience both joy and sorrow. This social aspect is maintained during the inpatient care process. Typically, caregivers at this stage are immediate relatives. They often provide emotional support in addition to assisting with the patient's treatment. As noted by **Gok Metin et al. (2019)**, a subpar hospital environment can lead to various issues, yet it can also offer emotional satisfaction for the caregiver. One way to characterize caregiver burden is through the negative responses to how caregiving affects the caregiver's social, professional, and personal responsibilities **Ogunyemi et al., 2021). So**, the study aimed to determine the effect of structured teaching program on stress and caregivers' burden of adult and elderly patients with bladder cancer.

Based on the demographic information of the patients involved in the present study, it was found that fewer than three-quarters of the participants were male, and three-fifths of them were aged 60 years or older. In terms of the duration since diagnosis (in months), it was noted that three-fifths of the participants had been diagnosed with the disease for less than six months. **Ramasubbu et al. (2020)** reported that 40% of their patients fell within the same age category.

With respect to cancer stage, it was observed that less than half of the patients in the study were classified as stage III and had undergone a combination of surgery, chemotherapy, and targeted therapy as their treatment regimen. These findings are consistent with those of **Zou et al. (2020),** who indicated that chemotherapy and surgery were the most frequently utilized interventions. Similarly, **Rasul & Amen (2022)** reported the use of radiation, chemotherapy, and surgery as treatment modalities. However, these results contrast with those of **Yesilbalkan et al. (2019),** who discovered that three-quarters of their patients had cancer that had persisted for three years, with the majority having received chemotherapy. Conversely, nearly one-third of patients received radiation treatment, as noted by **Rezaei et al. (2020).** This discrepancy may be attributed to the fact that chemotherapy is typically the first-line treatment for cancer following surgery and has demonstrated efficacy. Furthermore, **Wenhao et al. (2021)** corroborated these findings, revealing that over half of informal caregivers were unemployed.

The current study revealed that more than half of the caregivers were female and aged 30 years or older, with over two-fifths lacking employment and more than half having attained only basic education. Various studies conducted by **Ogunyemi et al. (2021), Akpan-Idiok & Anarado (2019), Boostaneh et al. (2021), Gabriel et al. (2019), Jite et al. (2021), and Sun et al. (2022)** have shown that women predominantly assume the responsibility of caring for cancer patients. The average age of participants in our study was 40.4 years, which exceeds the ages of 35.9 and 39.71 years reported by **Akpan-Idiok (2021).** This suggests that the majority of healthcare professionals involved in treating patients are older than previously documented.

Our results were not in agreement with those of Y**asar & Terzioglu (2022), Ogunyemi et al. (2021**), and others who indicated that parents and relatives served as the primary caregivers. Our research introduces new insights by acknowledging sisters as potential primary caregivers in specific cultural or familial settings, even though parents and other family members are often the main caregivers.

The present study indicated that three-quarters of caregivers for patients with bladder cancer identified doctors as their primary source of information. This confirmed that caregivers acquire knowledge from appropriate sources.

The current research demonstrated an enhancement in the overall knowledge mean scores of caregivers, with a statistically significant difference observed between the mean scores of caregivers' knowledge following the structured teaching program compared to before the program. This, in the opinion of the researcher, highlighted the significant effect of the structured teaching program. These findings align with those of **De Lamaza et al. (2020**), who found that the clinical outcomes for caregivers improved and their knowledge levels increased due to the structured teaching program. Additionally, these findings are consistent with those of **Belongacem et al. (2019),** who identified a significant statistical correlation between the caregivers' overall knowledge prior to and following the program. This may be attributed to the impact of the structured teaching program that enhances caregivers' comprehension.

According to the current research, the overall knowledge level of caregivers has shown improvement following a structured teaching program focused on bladder cancer. This finding aligns with previous studies conducted by **Beaver et al. (2019**) on cancer patients and those undergoing surgery, which indicate that informational support and telephone follow-ups significantly enhance awareness regarding the disease. Prior to the structured teaching program, family caregivers in this study demonstrated a solid understanding of cancer, and their knowledge was further enhanced after the intervention, as noted by **El-Amin et al. (2021).** The study suggests that these variations may stem from the influence of regulations and reinforcement that bolster caregivers' comprehension.

The findings of the current research indicate that the overall knowledge level of the caregivers involved in the study has improved after the structured teaching program on bladder cancer. From the researchers' perspective, this reflects the success of the structured teaching program in achieving the study's objectives.

Furthermore, the results of the current study revealed a highly statistically significant difference in the caregiving practices of caregivers for patients with bladder cancer before and after the structured teaching program, demonstrating an enhancement in the mean scores of caregivers' total practices. From the researchers' viewpoint, this confirms the effectiveness of the instructional guidelines, which led to improvements in both knowledge and associated caregiving practices.

The present study indicated that fewer than one-fifth of the caregivers examined reported adequate practices before the structured teaching program, which subsequently enhanced the practices of the majority of caregivers after the program's implementation. **Eliana's (2019**) research suggests that approximately half of the caregivers in the study achieved satisfactory practice scores in the treatment of their cancer patients prior to the intervention, with this figure rising to over three-quarters post-intervention. The researchers propose that these variations may stem from the effectiveness of the structured teaching program in enhancing caregivers' practices and fulfilling the aims of the current study.

The current study also demonstrated that during the pretest, most caregivers exhibited high levels of stress. However, in the post-test, the majority reported a reduction in their stress levels, indicating a significant decrease and improvement following the program's application. From the researchers' perspective, this confirms the structured teaching program's effectiveness in enhancing knowledge and practices while contributing to a reduction in stress levels.

These findings align with **Broxson et al. (2020),** who discovered that caregiver stress can lead to various adverse effects, including declines in physical health, an increase in mental health challenges, and an overall reduction in quality of life. Caregiver stress poses a public health issue as it escalates financial burdens for individuals, families, and healthcare systems. Recognizing caregiver stress is the initial step in identifying those in need of support and providing high-quality care. Fortunately, a culturally sensitive, multifaceted strategy to address the social determinants of health and the unmet physical, psychological, and social/emotional needs of caregivers can mitigate or prevent caregiver stress. Similarly, **Poggio et al. (2019)** reported elevated stress levels attributed to the absence of a professional contact person during caregiving.

The findings of the study indicated that caregivers looking after patients with bladder cancer experienced a notable decrease in stress levels after participating in a structured teaching program. This outcome aligns with research conducted by **Zheng et al. (2019)**, which revealed that patients reported lower stress levels following the intervention compared to their pre-intervention state. Furthermore, the researchers observed no statistically significant reduction in the self-reported stress levels of participants who engaged in five weekly one-hour exercise sessions over a 12-week duration. Prior studies have shown that exercise sessions significantly enhanced participants' emotional well-being and reduced their reported stress levels, thereby supporting this conclusion **(Caldwell et al., 2021).**

The findings of the present study revealed a significant reduction in stress levels among caregivers tending to patients with bladder cancer after implementing post-stress management exercises. A study by **Steffen et al. (2020),** which investigated the effects of stress management exercises on stress alleviation, confirmed that stress levels decreased following the application of these exercises, thereby validating this result. It highlighted the effectiveness of the stress-reduction exercise regimen. Stress management has been proven to alleviate or address both physical and psychological disorders, including issues such as cognitive impairment.

According to the current research, there exists a highly statistically significant difference in the means of caregivers' ZBI scores when caring for patients with bladder cancer before and after the structured teaching program. This study indicates a reduction in the ZBI mean scores of caregivers following the structured teaching program. The researchers suggest that the reasons for these findings may include psychological, social, and physical health issues, as well as overall health outcomes. The duration and timing of the caregiving role significantly influence the mental health of the caregiver. These results align with the findings of **Oboh & Adaonfo (2019).** Furthermore, **Shieh et al. (2022)** noted that the caregiver burden was considerably lower for those who shared caregiving responsibilities. Research conducted by **Yigitalp et al. (2017)** and **Seo & Park (2019)** supports the notion that having assistance reduces the strain on caregivers.

In a related study, **Yildirim et al. (2013)** reported similar findings, establishing that the levels of caregiver burden were low, as it is a natural inclination for relatives to care for patients in need. Caregivers perceive this as an inherent duty and responsibility. Despite the challenges faced during the caregiving process, caregivers are expected to provide care at home, which may suggest either a lack of awareness regarding the burden of care or a complete acceptance of it due to learned helplessness; the mean scores were 28.70±16.14 for caregivers of patients undergoing three or more chemotherapies, and 21.75±9.66 for those caring for patients receiving fewer than three chemotherapies (Oksuz et al., 2013), with a similar score of 36.65±11.21 for caregivers of cancer patients (**Turkoglu & Kilic 2012**).

Onyeneho & Hesanmi (2021) discovered that following the intervention, only 5% of the caregivers in their research exhibited a high total burden of care, in contrast to 75% prior to the intervention. A potential explanation for this observation could be the findings of the study, which indicate that caregivers endure light to heavy loads. However, the study also revealed that the majority of caregivers reported experiencing only a minimal amount of stress. Due to their relationship with the care recipient, many individuals are hesitant to voice their thoughts, even when confronted with stress. This is understandable.

Similarly, **Shim & Ng (2019), Sanjeevani et al. (2022), Mirsoleymani et al. (2019),** and other research have indicated a considerable level of burden. The elevated burden of care may stem from both time and financial limitations, as numerous patients in our study faced financial difficulties, which frequently adversely affected the physical and mental well-being of the caregivers.

The current study identified a highly statistically significant difference in the stress levels of caregivers attending to patients with bladder cancer before and after the structured teaching program. From the researchers' viewpoint, these results reflect the beneficial impact of the structured teaching program, which enhances caregivers' knowledge and practices while alleviating their stress. One possible reason for the inability to achieve such a protective effect within the confines of this study may be associated with the participants' baseline level of stress (**Demırtepe-Saygılı et al., 2021**).

The current research identified a statistically significant relationship between overall knowledge, total practices, stress levels, and the overall burden of care among caregivers of bladder cancer patients, both before and after the structured teaching program. These results were supported by El-**Amin et al. (2021),** who examined the knowledge, attitudes, and practices of caregivers for cancer patients in Sudan. They found that the overall knowledge, total practices, and burden scores of caregivers for older adult cancer patients they studied exhibited a strong statistically significant correlation. This may be attributed to the varying levels of strain experienced by caregivers of cancer patients, which can depend on the disease stage and other patient-related factors.

It is crucial to comprehend the significant impact of caregiving duties on the well-being of caregivers in order to formulate effective support and intervention strategies. Family caregivers carry a substantial burden, especially in managing ostomies and other care-related responsibilities, and this burden necessitates attention as it can undermine their own quality of life and subsequently influence the overall care provided to patients. A primary consequence faced by patients with bladder cancer and urostomies is the emotional distress experienced by both patients and their caregivers, which is exacerbated by uncertainties regarding treatment options, associated costs, prognosis, and the care of family members **(Iovino et al., 2023).**

Conclusion

According to the findings of the present study, it was concluded that the structured teaching program positively influences the enhancement of knowledge and practices among caregivers of patients diagnosed with bladder cancer. In a similar vein, there was a statistically significant decrease in the burdens faced by caregivers who care for patients with bladder cancer, accompanied by a reduction in their stress levels.

Recommendations:

Based on the findings of this study, therefore recommend the following suggestion:

- Caregiver adaptation to caregiving processes must be continuously assessed, and caregivers should be made aware of the potential burdens and repercussions of providing care to safeguard them from experiencing adverse physiological or psychological effects.
- Professional support is vital, as the psychological well-being of both patients and caregivers is interconnected, with each influencing the other's emotional health and ability to manage cancer-related challenges.
- Upon discharge from the hospital, caregivers face challenges in managing stoma care and addressing related issues, underscoring the necessity for ongoing education and support.
- Enhancing caregiver support through educational programs and peer support groups is essential to address a range of concerns, including interpersonal relationships, daily routines, and financial anxieties.
- Programs such as the digital health education initiative have the potential to improve outcomes and reduce caregiver stress.
- It is highly recommended to implement ongoing training for caregivers regarding the significance of applying stress management strategies as part of routine care.
- Developing handbooks, pamphlets, and brochures to disseminate current information about bladder cancer is important.
- To generalize the findings, the study should be replicated with different samples and in various contexts.

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