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Effect of health literacy program on improving elderly women's awareness regarding atrophic vaginitis

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ABSTRACT

Background: As the number of elderly persons in our country increases, atrophic vaginitis affects 10 to 40% of postmenopausal women worldwide. Promotion of health literacy level is one of the main non-pharmaceutical measures proposed to older adults.

The aim of the study was to evaluate the effect of effect of health literacy program on improving elderly women's awareness regarding atrophic vaginitis.

Subjects and Methods: **Research design:** A quasi-experimental design was adopted to carry out this study. **Setting:** The study was conducted at Geriatric Social club at Zagazig city.

Subjects: Purposive sample of 70 elderly women who fulfilled the study inclusion criteria.

Tools for data collection: Tool I: A structured interview questionnaire was used for data collection. It was composed of three parts. (Part I) elderly women demographic characteristics, (Part II) medical and obstetric history and (Part III) Risk factors of atrophic vaginitis.

Tool II: Awareness of elderly women regarding atrophic vaginitis.

Results: Out of the 70 elderly women, only 18.6% of the studied elderly women had satisfactory total knowledge regarding atrophic vaginitis pre the program, which improved to 65.7% post program. Additionally, there was a highly statistically significant positive correlations between the studied elderly women' knowledge, self- care practice pre and post program at ($p < 0.01$), and there was a highly statistically significant difference between pre & posttest program as regarding health literacy awareness about atrophic vaginitis for elderly women.

Conclusion: The health literacy program produced substantial, clinically meaningful improvements in knowledge among elderly women with atrophic vaginitis, translating into greater symptom awareness.

Recommendations: Integrating culturally tailored education into geriatric and primary care pathways which, encourage healthy and positive awareness about atrophic vaginitis in women in early age rather than teaching them when grown up.

Keywords: *Health literacy program, Elderly women's awareness, Atrophic vaginitis*

1. INTRODUCTION

Population aging and improved life expectancy have resulted in the increasing number of menopausal women so that most women currently spend one third of their life after menopause. According World Health Organization there will be 1.3 billion menopausal women in the world in 2030 (Barati et al., 2021(. Egypt is the most populous country in the Middle East; Central Agency for Public Mobilization and Statistics (CAPMAS) 2021, clarified that number of female elderly persons in Egypt is 3.2 million, which represent about 6.4% of total female population.

Atrophic vaginitis is an inflammation of the vagina which develops when there is a significant decrease in estrogen levels after menopause. More than half of menopausal women are concerned about the symptoms of atrophic vaginitis. However, only 25% of patients with the symptoms receive adequate therapy. Probably due to some patients are embarrassed to discuss intimate complaints with a specialist or regard the symptoms as manifestations of the natural aging process and do not seek help. So, Atrophic vaginitis considered as a silent epidemic that affects up to 50%–60% of postmenopausal women who are suffering in silence from this condition (Kaufman et al., 2023).

A decrease in vaginal lubrication is an early hallmark of hormone insufficiency leads to following signs and symptoms: Vaginal dryness, burning, dyspareunia · Loss of vaginal secretions, leukorrhea, vulvar pruritus. Feeling of pressure, itching and yellow malodorous discharge. Urethral discomfort, frequency, hematuria, urinary tract infection. Dysuria and stress incontinence. All atrophic vaginitis symptoms can be exacerbated by a simultaneous infection of candidiasis, trichomoniasis or bacterial vaginosis (Mary Ann et al., 2022)..

Atrophic vaginitis can affect quality of life and relationship with the partner. There are physical and emotional side effects of atrophic vaginitis. Physical symptoms like pain, burning, itching and leaking pee can disrupt all areas of the life. Emotional side effects are just as complicated as the physical side effects. People experiencing symptoms of vaginal atrophy may lose interest in sex and intimacy or lose confidence in themselves. Atrophic vaginitis is not a life-threatening disease, but it can significantly negatively affect patients' quality of life if not diagnosed and treated appropriately. Interprofessional communication and patient education are essential **(Krychman, 2023)**.

Certain factors may contribute to atrophic vaginitis, such as smoking that affects blood circulation, resulting in the vagina and other tissues not getting enough oxygen. Smoking also reduces the effects of naturally occurring estrogens in the body. In addition, women who smoke typically experience an earlier menopause, also no vaginal births. Researchers have observed that women who have never given birth vaginally are more likely to develop vaginal atrophy than women who have had vaginal deliveries, and no sexual activity **(Hafiz, et al., 2024)**.

Topical estrogen as vaginal estrogen cream which is directly applied into the vagina, usually at bedtime. Typically, women use it daily for one to three weeks and then one to three times a week thereafter. Although creams may offer faster relief than do other forms of vaginal estrogen, they can be messier. And vaginal estrogen ring, it is a soft, flexible ring into the upper part of the vagina. The ring releases a consistent dose of estrogen while in place and needs to be replaced about every three months. Many women like the convenience this offers. A different, higher dose ring is considered a systemic rather than a topical treatment **(Abd-El Rahman, et al.2024)**.

Health literacy (HL) is a major factor affecting Self-care. Health literacy is defined as the degree to which individuals have the capacity to obtain, process, and understand the health information they need to make appropriate health decisions, including a constellation of reading, listening, analysis, and decision-making skills and applying these skills in health situations (**Beni et al., 2022)**.

Nursing interventions regarding vaginitis involve teaching, counseling for prevention, and explaining prescribed medications. Educational nursing intervention includes; educating women to modify the unhealthy hygienic practices and adopting the recommended lifestyle behaviors to prevent the occurrence as well as recurrence of vaginitis to improve quality of life. Additionally, nurses should provide emotional support and therapeutic communication to overcome a woman's embarrassment regarding vaginitis and correct misunderstanding and myths regarding this problem (**Elsayed et al., 2019)**.

Low health literacy is considered a worldwide health threat. Gerontological nurses have an advocator role for interventions to promote health literacy and improve health outcomes of older people to maximize their capacity to self-manage **(Mahnoosh et al., 2024)**.

Significance of the study:

Approximately 1.2 billion women worldwide will be menopausal or postmenopausal by the year 2030, with 47 million new entrants each year. About 45% of healthy postmenopausal women have symptoms related to atrophic vaginitis. Only about 25% of women who are experiencing symptoms actually seek medical attention. Instead, women believe that the symptoms are a normal, unavoidable part of getting older. Up to 40% of women who had gone through menopause were unaware of postmenopausal atrophic vaginitis **(Mohamady et al., 2023)**.

Egypt is the most populous country in the Middle East; **Central Agency for Public Mobilization and Statistics (CAPMAS) 2021,** clarified that number of female elderly persons in Egypt is 3.2 million, which represent about 6.4% of total female population. In this context, **Sturdee & Panay, (2023)** clarified that cultural and religious taboos in the Middle East regarding sexual life and related issues inhibit some women from discussing vaginal dryness and sexuality issues with health-care providers.

As well as, **Moustafa et al., (2019)** showed that In Egypt, especially the Upper Egypt region, women are not so open to talk about the problem of vaginitis. If the condition of atrophic vaginitis persists, it may lead to serious infection. Early diagnosis and treatment may prevent the progress of vaginal atrophy or control existing symptom.

Aim of the study:

The current study aimed to evaluate the effect of health literacy program on improving elderly women's awareness regarding atrophic vaginitis

Research Hypothesis:

Elderly women awareness regarding atrophic vaginitis can be improved after application of health literacy program than

before application.

Subjects and methods:

Research design:

A quasi-experimental design was adopted to carry out this study.

Study setting:

The current study was carried out at Geriatric Social club at Zagazig city.

Study subjects:

A purposive sample of 70 elderly women attending to previously mentioned setting, who fulfill the following criteria:

Inclusion criteria:

Elderly women aged 55 years and above.

Alert and able to communicate.

Exclusion criteria:

Receiving chemotherapy or radiotherapy.

Suffering from mental disorder.

Sample size calculation:

Mohamady, et al 2023, found that percent of positive attitude regarding vaginal atrophy post intervention program was (85.4%) and (56.9%) pre intervention, confidence level is 95% two side with power of study 95% with Sample size calculated using Open Epi, is 70 elderly women.

Tools of data collection:

Two tools were used to collect the necessary data as following:

Tool I: Structured interview questionnaire:

It was developed by researchers based on the literature review. It consisted of three main parts as follow:

Part 1: Demographic characteristics of the elderly women This part included data about the elderly enrolled in the current study as follow: age, marital status, education, occupation, and work nature…etc.

Part 2: Medical and obstetric history: This part included two sub items:

medical and obstetric history: This part included questions about history of chronic diseases, previous surgery, investigations, medications taken and obstetric history, which were in the form of mix between closed and open-ended questions.

current medical history of studied elderly women of atrophic vaginitis: This part included closed ended questions about; Do elderly women suffer from atrophic vaginitis, the number of times they suffer from atrophic vaginitis, character/color of vaginal discharge, it has a bad odor, if women suffer from vaginal itching or scratching, dryness & pain during intercourse and receiving early diagnosis and treatment by specialists.

Part 3: Risk factors of atrophic vaginitis: it clarifies risk factors made studied elderly women at high risk for developing atrophic vaginitis as aging, exposure to frequent stressors, frequent pregnancy and childbirth, hypertension, diabetes, and frequent intercourse.

Tool II: This tool is guided by **Abd- Elmohsen, (2013);** It was designed by the researcher after reviewing related literature to:

Assess the awareness of elderly women regarding atrophic vaginitis; it contains eleven closed-ended questions about: definition of vagina, definition of atrophic vaginitis, causes, when does atrophic vaginitis occur, symptoms, period of symptoms, number of vaginitis episodes per year, Risk factors of atrophic vaginitis, complications, treatment and healthy measures that should be followed regarding atrophic vaginitis.

Scoring system: Each questions had a number of correct answers each studied sample was asked to select more than answer for each answer was given 1 for correct and 0 for not correct. These scores summed up and converted into a percent score. The total score of awareness is (40). It was divided into two levels, the woman was considered to have satisfactory Knowledge if the score was ≥60% (scoring 24 to 40), and unsatisfactory if<60% (scoring 23).

Content validity & Reliability:

Once prepared, the tool was presented to a panel of three experts in the field of Obstetric & Gynecological Nursing, Community Health Nursing, Faculty of Nursing, Zagazig University, and Community medicine, Faculty of Medicine, Zagazig University. The panel reviewed the tool content for relevance, clarity, comprehensiveness and understandability. This constituted the content validation of tools. All recommended modifications were applied. The reliability of this tool was tested by measuring their internal consistency. It demonstrated a good level of reliability with Cronbach's alpha as follow:

Cronbach α of Awareness of elderly women regarding atrophic vaginitis questionnaire was 0.843.

Fieldwork

Once permission was granted to proceed with the study, the researcher started to prepare a schedule for collecting the data. The fieldwork was carried out within six months starting from the beginning of May 2024 to the ending of October 2024. Each elderly woman was interviewed individually in the Geriatric social club' garden. The researcher allocated two days weekly from 9 am to 1 pm.

Pilot study:

Before performing the main study, a pilot study was carried out on 7 elderly women representing 10% of the total studied sample, to test its feasibility, clarity, comprehensiveness and applicability of the study tools. Also, to estimate the necessary time for completion of the data collection tools sheet. All participants received a clear clarification about the study purpose. The elderly enrolled in the pilot, were included in the main study sample as there were no modifications done.

Statistical analysis:

Data entry and statistical analysis were done using SPSS 27.0 statistical software package. Data were presented using descriptive statistics in the form of frequencies and percentages for qualitative variables, and means and standard deviations for quantitative variables. The Cronbach alpha coefficient was calculated to assess the reliability of the developed tools through their internal consistency. Qualitative categorical variables were compared using a chi-square test (x2). The spearman rank correlation was used for assessment of the interrelationships among quantitative variables and ranked ones. In order to identify the independent predictors of the knowledge and self-care multiple linear regression analysis was used after testing for normality, and homoscedasticity, and analysis of variance for the full regression models were done. Statistical significance was considered at p-value <0.05.

2. RESULTS:

Concerning demographic characteristics of the studied subjects, the current study revealed that, (64.3%) of the elderly women's age was more than 70 years, with mean 71.2 ± 4.6 and (100%) of them were living in urban areas. In addition (80%) of the studied elderly women were widowed and (41.4%) of them were have basic education. Moreover (98.6%) of the studied elderly women not working and 57.1% of them living with husband's pension.

Regarding medical history, (74.3%) of studied elderly women were having hypertension, (68.6%) were having osteoporosis and osteoarthritis, while (61.4%) of them were having diabetes. In addition (100%) of studied elderly women were history of normal labor.

Regarding obstetric history, (61.4%) of studied elderly women reached menarche at 12 years. Additionally (60%) of them had a parity of > 3times, (74.3%) of them had gravidity > 3 times and (71.4) of them reported no history of abortion.in addition (82.9%) of the studied elderly women were used contraceptive methods and (65.7%) of them were used IUD. Meanwhile (77.1%) of studied elderly women their age of last menses were at age >50 years.

Figure 1 displays that (82.9%) of studied elderly women were having regular menstrual pattern, while (17.1%) of them having irregular menstrual pattern.

Regarding history of studied elderly women of atrophic vaginitis; (100%) of studied elderly women suffering from atrophic vaginitis with (42.9) of them experiencing episodes every 6 months. Additionally vaginal discharge was presented in (82.9%) of studied elderly women suffering and (48.3%) of them reported white discharge. Moreover (82.7) of studied elderly women were having bad odor vaginal discharge, (87.1%, 55.6% and 85.7%) of them did not suffering from vaginal itching, redness or bloody and dryness & pain during intercourse respectively.

Figure 2 displays that (84.3%) of studied elderly women did not diagnosis and treatment early by specialists, while (15.7%) of them were diagnosis or treatment early by specialists.

Table 1 displays the Knowledge pre and post program among studied elderly women. As the table reveals, there were improvements in knowledge of elderly women regarding atrophic vaginitis post program with a highly statistically significant difference (P< 0.01) between pre and post program. As evidence, highly reported score of knowledge post program among studied elderly women were symptoms of atrophic vaginitis, risk factors of atrophic vaginitis and healthy measures that should be followed regarding atrophic vaginitis (65.7%, 67.1% and 67.1%) respectively.

Table 2 displays relation between studied elderly women's knowledge and their demographic characteristics**.** As the table reveals, there was a statistically significant relation between studied elderly women's total level of knowledge regarding atrophic vaginitis and their age, marital status ($p<0.05$) and there was a highly statistically significant relation between studied elderly women's total level of knowledge regarding atrophic vaginitis and their level of education($p<0.01$). As noticed from this table, elderly women whose aged ≥70, widowed and having secondary education had the highest level of knowledge regarding atrophic vaginitis.

Table 3 reveals; age, and number of abortions were a highly statistically negative predictors of knowledge score at $p<0$ .001, respectively. In addition, level of education was a highly statistically positive predictors of knowledge score at $p<0$ .001. As well, marital status had slight frequency positive effect on total knowledge score at p value= 0.034. The model explains 755% of the variation at total knowledge score as the value of r-square indicates.

Figure 3 total knowledge pre and post program among studied elderly women; pre the program, only 18.6% of the studied elderly women had satisfactory total knowledge regarding atrophic vaginitis which improved to 65.7% post program had satisfactory total knowledge regarding atrophic vaginitis.

3. DISCUSSION:

Concerning demographic characteristics, it is clear from the results of the current study that age is the most important factor that affects health of women; in the present study approximately 65% of the elderly women were above 70 years old (≤70) with an average age of 71.2 ± 4.6 years, while 35.7% were between 60-70 years. This indicates that the majority of participants were in the advanced elderly age group, which aligns with the higher prevalence of atrophic vaginitis in older postmenopausal women. This finding is consistent with literature showing that vaginal atrophy symptoms increase with advancing age post- menopause **(Shah et al., 2018)**.

In consistence with our study, **Abd-Elaziz & Ahmed, (2019)** in Assiut city, founded that elderly women with an average age of 66.2 years old with a range of 60-80 years old. Also, **Koyuncu et al., (2018)** in the district center of Beylikova (Turkey) reported that an average age of 50.41 ± 6.36 years (range 40– 64) in their study.

In disagreement with our findings, other studies reported that significantly lower ages of included female participants, which indicates that atrophic vaginitis is not exclusive to old post-menopausal women, as it could similarly affect middle-aged menopausal women as well. **El Sayed et al., (2019)** in Benha city, reported that a mean average age of 29.63 ± 5.52 years for the group of women that had vaginitis. However, it should be noted that while a considerable percentage of women had atrophic vaginitis in this study, others suffered from inflammatory or infectious vaginitis. This could explain the relatively lower age compared to our study.

Also, Moreover, the current study findings revealed that all the participants (100%) lived in urban areas, which is mainly related to the geographical location of the study site, which is situated within the boundaries of a highly urbanized community. Consequently, the sample population was naturally drawn from an environment characterized by urban living conditions, limited exposure to rural lifestyles, and the availability of healthcare and social services that are concentrated in city settings. Urban residence may facilitate access to healthcare services and health education programs, though cultural taboos around discussing vaginal health issues persist even in urban settings, as noted in Middle Eastern contexts **(Mohamady et al., 2023)**. In agreement with our results, **Abd-Elaziz & Ahmed, (2019)** in Assiut city, reported that nearly 81% of the participants were living in urban areas. Also, this result agrees with **Ahmed, (2014)**, in his study about the effect of educational program on menopausal symptoms in Benha city, who mentioned that two thirds of the studied group and more than of control group lived in urban area.

Education is considered as one of the decisive and highly influential factor in reproductive behavior. The present study showed that, the levels of education were as following: 41.4% had basic education, 40% secondary education, 14.3% could read and write, and only 4.3% had university education. The predominance of lower educational levels may contribute to limited health literacy and awareness about atrophic vaginitis. Research demonstrates that higher educational levels are associated with better health knowledge and self-care practices **(Karakoç et al., 2019)**.

In agreement with our findings, **Koyuncu et al., (2018)** in the district center of Beylikova (Turkey) found that, nearly 81.5% of the participants had primary school or lower. Also, **Mohamady et al., (2023)** in Tanta city, reported that the majority of the females had only primary education (76.4%) with only 5.7% with a university degree. Additionally, **El habashy, (2017)** in the study about assessing the effect of menopausal symptoms on women's quality of life in Benha city, who mentioned that, the lowest proportion of the studied women are highly educated

On the other hand, **Abd-Elaziz & Ahmed, (2019)** in Assiut city, found that approximately 74% of the included participants were illiterate or read & write; 17.0% primary/preparatory. Similarly, this result disagrees with **Shams-Eldin, (2018),** who studied knowledge, attitude and severity of menopausal symptoms among women attending primary health care centers in Cairo, Egypt, who reported that, the majority of the studied women were university and higher educational level. However, this may be due to differences in culture and society of women in setting of the study.

The objective of the present program was to evaluate the effect of health literacy program on improving elderly women's awareness regarding atrophic vaginitis; In our study, 100% of the participants were having or had some form of atrophic vaginitis, with 42.9% experiencing episodes every 6 months. This universal prevalence is higher than reported in other studies, which typically show 40-50% prevalence in postmenopausal women. This may reflect the specific demographics of the study population or selection criteria **(Mohamady et al., 2023)**.

The most common reported symptom was vaginal discharge (82.9%), followed by bad odor discharge (82.7%), pain during intercourse (14.3%) and vaginal itching (12.9%). The symptom profile aligns with typical atrophic vaginitis presentations, while the relatively low rates of sexual symptoms may be related to the high proportion of widowed women and reduced sexual activity in this age group **(Huang et al., 2019)**.

Despite the significant prevalence and symptomatic burden of atrophic vaginitis reported among the included participants, only 15.7% sought early diagnosis and treatment from specialists, while 84.3% did not. This finding reflects the global pattern of under-reporting and under-treatment of atrophic vaginitis. Studies consistently show that only 20-25% of symptomatic women seek medical attention, often due to cultural taboos and misconceptions about aging **(Nappi et al., 2019)**.

This global pattern of under-reporting and under-treatment is further supported by findings that cultural taboos, lack of awareness about available therapies, and limited proactive conversations between healthcare providers and patients contribute to delayed diagnosis and inadequate management **(Naumova & Castelo-Branco, 2018)**.

Analysis of the participants' knowledge and awareness outcomes at baseline pre-program showed that individual areas demonstrated poor scores with only 8.6% had satisfactory total knowledge regarding atrophic vaginitis before the program.

This knowledge level improved dramatically to 65.7% satisfactory post- program. We also observed a significant improvement in the individual knowledge points, such as symptoms recognition, risk factors and healthy measures. These results demonstrate the effectiveness of structured health literacy programs.

In consistent with our findings, **El Sharkawy et al., (2020)** in Ain- Shams University reported that, similar significant improvements from 12.6% pre-program to 58% after the program ($P < 0.01$). Also, in agreement with our findings**, Mohamady et al., (2023)** in Tanta city reported that, vaginal atrophy knowledge improved significantly from 12.2% to 59.3% after the health education program. Following the same trend, **Abd-Elaziz & Ahmed, (2019)** demonstrated that the awareness about vaginal atrophy improved from 18% to 92% post-program.

Similar to our results, **Koyuncu et al., (2018)** in the district center of Beylikova (Turkey) reported that the interventional health program managed to improve the median knowledge score, with a substantial gain across knowledge domains ($P < 0.001$). Similar results were also obtained in the study conducted by **El Sayed et al., (2019)** in Benha city.

Collectively, we can conclude that our health literacy program achieved a statistically and clinically significant improvement in the knowledge (18.6% to 65.7%) of the included participants.

These results demonstrate exceptional program effectiveness, exceeding outcomes reported in similar studies, which confirms the value of targeted health education programs for addressing gaps in women's health knowledge, particularly for conditions that are culturally sensitive or poorly understood **(Nappi et al., 2019)**.

Our correlation analysis revealed Significant relationships between knowledge and being in the 60-70 age group, married, and being with higher education level ($P<0.01$). These findings align with health literacy research showing that younger age, married status, and higher education are associated with better health knowledge **(Anger et al., 2012)**.

4. CONCLUSION:

Based upon the findings of the present study and answer of research hypothesis, it can be concluded that: the health literacy program produced substantial, clinically meaningful improvements in knowledge and self-care among elderly women with atrophic vaginitis, translating into better hygiene practices and greater symptom awareness. Given the high burden of comorbidity, limited baseline literacy, and low care-seeking observed, these findings support integrating culturally tailored education into geriatric and primary care pathways to improve detection and management of genitourinary syndrome of menopause.

5. RECOMMENDATIONS

Based on the current study findings, the following recommendation is suggested that: Use a booklet and posters as methods to increase women's awareness about atrophic vaginitis in outpatient clinics. Activate the counseling program and provide guideline to couples about dyspareunia caused by atrophic vaginitis. Encourage healthy and positive attitude about atrophic vaginitis and menopause in women in early age rather than teaching them when grown up. Increase appropriate knowledge about the risk factors of atrophic vaginitis and importance of routine screening.

Table (1): Awareness pre and post program among studied elderly women (n=70)

Items	Awareness									
	Pre				Post				χ^2 test	P – Value
	Satisfactory		Unsatisfactory		Satisfactory		Unsatisfactory			
	N	%	N	%	N	%	N	%		
Definition of vagina	21	30.0	49	70.0	44	62.9	26	37.1	15.2	<0.01**
Definition of atrophic vaginitis	17	24.3	53	75.7	38	54.3	32	45.7	13.2	<0.01**
Causes of atrophic vaginitis	11	15.7	59	84.3	40	57.1	30	42.9	25.9	<0.01**
Occurrence of atrophic vaginitis	12	17.1	58	82.9	41	58.6	29	41.4	25.5	<0.01**
Symptoms of atrophic vaginitis	14	20.0	56	80.0	46	65.7	24	34.3	29.8	<0.01**
Period of symptoms from the beginning at this episode	13	18.6	57	81.4	44	62.9	26	37.1	28.4	<0.01**
Number of vaginitis episodes per year	12	17.1	58	82.9	39	55.7	31	44.3	22.5	<0.01**
Risk factors of atrophic vaginitis	14	20.0	56	80.0	47	67.1	23	32.9	31.6	<0.01**
Complications of atrophic vaginitis	15	21.4	55	78.6	42	60.0	28	40.0	21.6	<0.01**
Treatment of atrophic vaginitis	8	11.4	62	88.6	36	51.4	34	48.6	26.0	<0.01**
Healthy measures that should be followed regarding atrophic vaginitis	16	22.9	54	77.1	47	67.1	23	32.9	27.7	<0.01**

** Highly significant at $p \leq 0.01$ * statistically significant at $p \leq 0.05$ not significant at $p > 0.05$

Table (2): Relation between studied elderly women's Awareness and their demographic characteristics

Demographic characteristics	Awareness									
	Pre					Post				
	Satisfactory (n=13)		Unsatisfactory (n=57)		χ2 test & P. value	Satisfactory (n=46)		Unsatisfactory (n=24)		χ2 test & P. value
	No	%	No	%		No	%	No	%	
Age in years										
60<70	8	61.5	17	29.8	4.6 0.03*	21	45.7	4	16.7	5.8 <0.02*
≥70	5	38.5	40	70.2		25	54.3	20	83.3	
Marital status										
Single	0	0.0	1	1.8	14.3 <0.01**	0	0.0	1	4.2	8.8 0.03*
Married	6	46.2	4	7.0		10	21.7	0	0.0	
Widowed	6	46.2	50	87.7		35	76.1	21	87.5	
Divorced	1	7.7	2	3.5		1	2.2	2	8.3	
Level of education										
Reads and writes	4	30.8	6	10.5	8.2 0.04*	8	17.4	2	8.3	17.0 <0.01**
Basic education	7	53.8	22	38.6		11	23.9	18	75.0	
Secondary	1	7.7	27	47.4		25	54.3	3	12.5	
University	1	7.7	2	3.5		2	4.3	1	4.2	
Occupation										
Need to physical power	5	38.5	12	21.1	1.7 0.19	11	23.9	6	25.0	0.10 .092
Neurological and physical exhaustive	8	61.5	45	78.9		35	76.1	18	75.0	
Person sponsoring										
Husband's pension	5	38.5	35	61.4	3.0 0.38	24	52.2	16	66.7	1.9 .059
Herself	5	38.5	15	26.3		15	32.6	5	20.8	
Father's pension	2	15.4	3	5.3		4	8.7	1	4.2	
Son	1	7.7	4	7.0		3	6.5	2	8.3	

** Highly significant at $p \leq 0.01$ * statistically significant at $p \leq 0.05$ not significant at $p > 0.05$

Table (3): Best fitting multiple linear regression model for total Awareness score

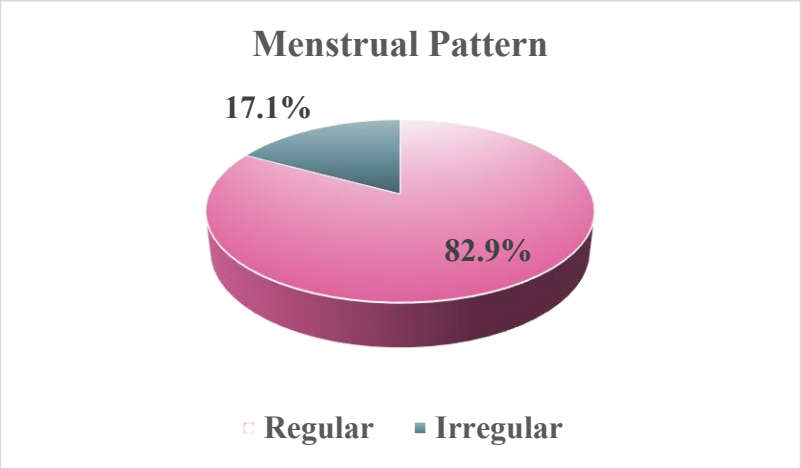
Items	Unstandardized Coefficients	Standardized Coefficients	T test	P. value
	B	B		

Figure (1): Menstrual pattern of studied elderly women (n=70)

Age	-0.717	-.0128	8.5	<0.001**
Marital status	0.167	0.152	2.4	0.034*
Level of education	0.395	0.319	6.4	<0.001**
Number of abortion	-0.608	-0.367	3.0	<0.001**
Model	**R2**	**Df.**	**F**	**P. value**
Regression	0.755	3	12.16	0.001**

a. Dependent Variable: Knowledge

b. Predictors: (constant): Age, Marital status, Level of education and number of abortion



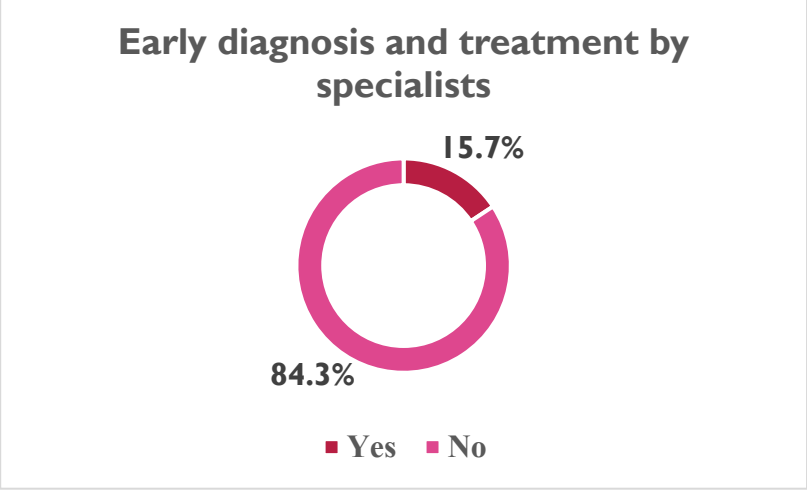


Figure (2): Early diagnosis and treatment by specialists of studied elderly women of atrophic vaginitis (n=70)

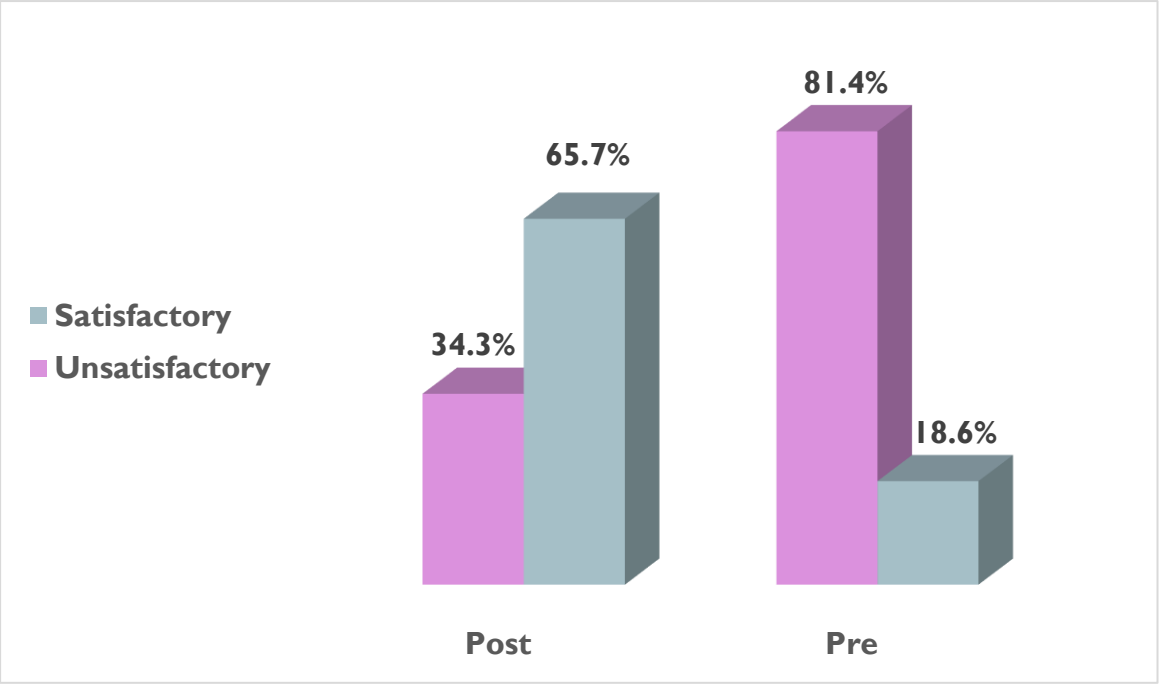


Figure (3): Total Awareness pre and post program among studied elderly women (n=70)

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