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ORIGINAL PAPER

ORYGINALNY ARTYKUŁ NAUKOWY

KNOWLEDGE AND BARRIERS RELATED TO THE PREVENTION OF PROSTATE CANCER AMONG MEN

WIEDZA I BARIERY ZWIĄZANE Z PROFILAKTYKĄ RAKA GRUCZOŁU KROKOWEGO WŚRÓD MĘŻCZYZN

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Summary

Background. According to the data, 17,832 new cases of prostate cancer and 5,458 deaths were registered in Poland in 2021. Raising awareness of prostate cancer will help prevent so many male deaths caused by this type of cancer. The aim of the study was to assess men's knowledge of prostate cancer contributing to death and the role of taking preventive action.

Material and methods. The study covered 106 men over 40 years of age from the Masovian Province, from February to June 2023. The research tool was an original survey

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questionnaire. A non-parametric χ^2 test was used in the statistical analysis. The significance level of $p<0.05$ was adopted. In addition, the relationship strength (rp) was determined. The analysis was carried out using Statistica software.

Results. 76% of respondents were not familiar with any of the prostate cancer prevention programs, with consequences for the level of male participation in these initiatives. Only 4% of respondents participated in them. Few (15%) assessed that access was good enough. 75% of respondents were unaware of the relationship between the incidence and genetic determinants of prostate cancer and the relationship between the incidence and the occurrence of a high number of deaths.

Conclusions. The men surveyed had very low levels of knowledge about prostate cancer. Participation in cancer prevention programs and campaigns was at an unsatisfactory level.

Keywords: prostate cancer, incidence, death, men, prevention

Streszczenie

Wprowadzenie. Według danych, w Polsce w 2021 r. zarejestrowano 17 832 nowych zachorowań na raka gruczołu krokowego i 5 458 zgonów. Podnoszenie świadomości na temat raka gruczołu krokowego pozwoli zapobiec występowaniu tak dużej ilości zgonów mężczyzn spowodowanego tego rodzajem nowotworu. Cel pracy było dokonanie oceny stanu wiedzy mężczyzn na temat raka gruczołu krokowego przyczyniającego się do wystąpienia zgonów oraz roli podejmowania działań profilaktycznych.

Materiał i metody. Badaniami objęto 106 mężczyzn po 40 roku życia z terenu województwa mazowieckiego, w okresie od lutego do czerwca 2023 r. Narzędzie badawcze stanowił autorski kwestionariusz ankiety. W analizie statystycznej wykorzystano test nieparametryczny

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χ^2. Przyjęto poziom istotności $p<0,05$. Dodatkowo określono siłę badanych związków (rp). Analizę przeprowadzono za pomocą programu Statistica.

Wyniki. Spośród badanych, 76% nie znała żadnego z programów profilaktycznych raka gruczołu krokowego, co miało konsekwencje w poziomie udziału mężczyzn w tych inicjatywach. Jedynie 4% badanych w nich uczestniczyło. Niewielu (15%) oceniło, iż dostęp był wystarczająco dobry. 75% badanych nie wiedziała o występowaniu związku pomiędzy zachorowaniem, a uwarunkowaniami genetycznymi raka gruczołu krokowego oraz związku pomiędzy zachorowaniem a wystąpieniem dużej ilości zgonów.

Wnioski. Badani mężczyźni mieli bardzo niski poziom wiedzy na temat raka gruczołu krokowego. Uczestnictwo w programach i kampaniach z zakresu profilaktyki raka było na niezadowalającym poziomie.

Słowa kluczowe: rak gruczołu krokowego, zachorowalność, zgon, mężczyźni, profilaktyka

Introduction

One of the most serious public health problems in Poland and worldwide is the incidence of and deaths from malignant neoplasms [1].

Prostate cancer (PCa), is the second most common cancer and the fifth most common cause of cancer deaths among men in 2020. It is the most commonly diagnosed cancer in men in more than half (112 out of 185) of the world's countries. Incidence rates range from 6.3 to 83.4 per 100,000 men by region, with the highest rates in Northern and Western Europe, the Caribbean, Australia/New Zealand, North America and South Africa, and the lowest rates in Asia and North Africa. Prostate cancer is the leading cause of cancer deaths among men in 48

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countries, including many countries in Africa, the Caribbean and Central and South America, as well as Sweden [2].

In Poland, PCa is one of the most common cancers in men at 19.6%, and the risk of developing the disease increases with increasing life expectancy. According to the Polish National Cancer Registry, there were 17,832 new PCa cases and 5,458 deaths in Poland in 2021. As the data show, the Masovian Province was ranked second in terms of incidence (1994) and first in terms of deaths (713) from PCa among men in Poland in 2021. The distribution of incidence and deaths by province is shown in Figure 1 [3]. As shown by the Masovian Cancer Registry (MRN), the Masovian Province ranked first in terms of the number of registered new cases of malignant neoplasms in general; the percentage was 12.2% of all malignant neoplasms, and first in terms of the number of deaths from malignant neoplasms; the percentage was 13.4% of all deaths from malignant neoplasms in Poland in 2021. However, among the total number of malignant neoplasms registered in 2021 in the Masovian Province, malignant neoplasms in men were the most common (prostate 20.0%, lung 16.1%, colon 6.6%, skin 6.4%, bladder 5.5%). The standardized incidence ratio was 39.8 new cases per 100,000 men for PCa. The distribution of morbidity and death by age in the province is shown in Table 1 [4].

Table 1. Distribution of morbidity and deaths by age in the Masovian Province in 2021

Type	Age range						
	0-39	**40-49**	**50-59**	**60-69**	**70-79**	**80 +**	**Total**
Morbidity	2	15	146	833	784	214	1994
Deaths	0	1	21	123	256	312	713

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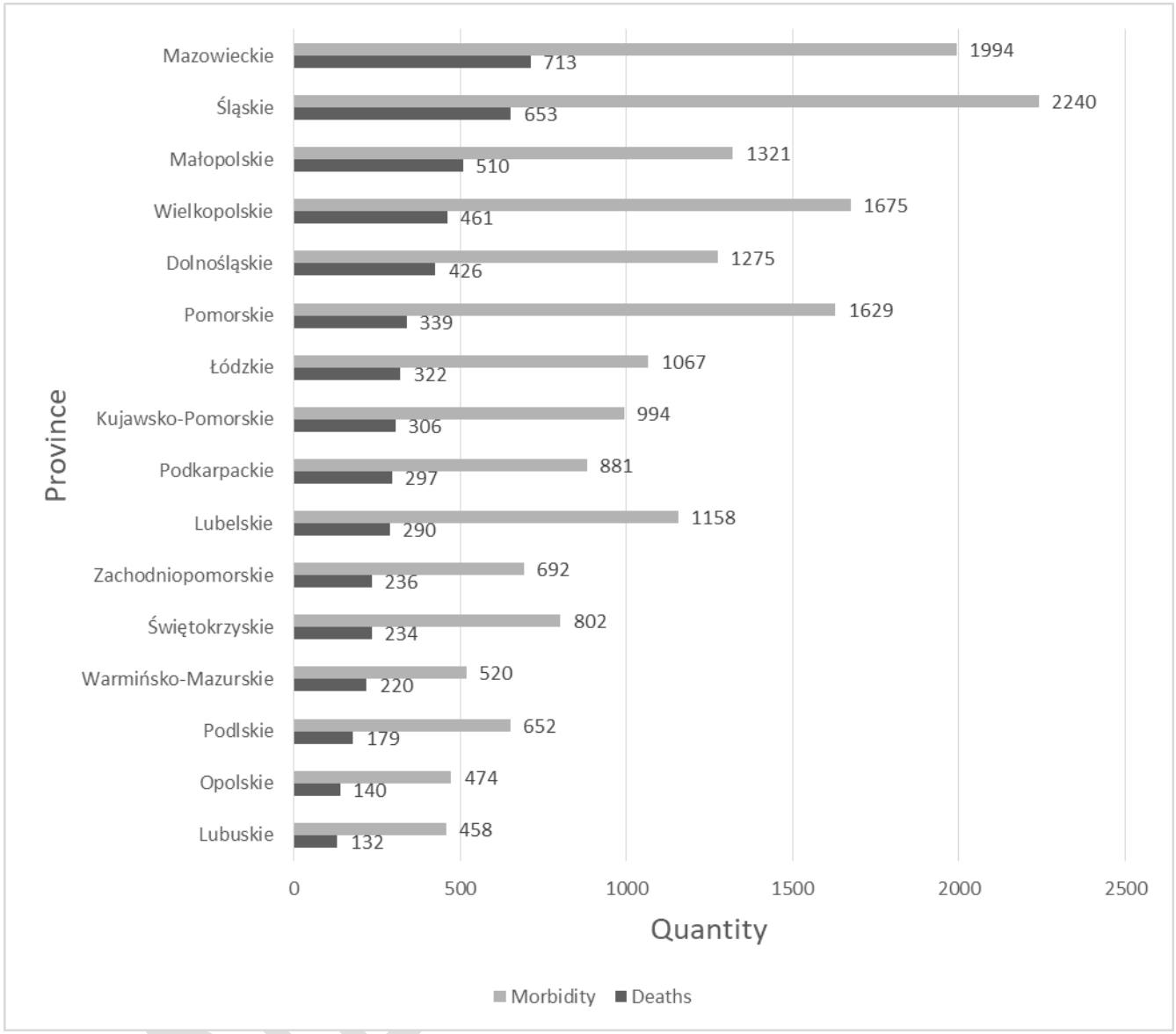

Figure 1. Incidence and deaths from PCa among men in Poland by province in 2021

The main factor influencing the development of PCa is the ageing of the population. The majority of cases affect the male population over 60 years of age, with a peak incidence between 70 and 80 years of age. Cancerous lesions are rarely detected in men under 40 years of age [5-7].

The irreversible trend of an ageing population continues worldwide, so it is estimated that the incidence of prostate cancer among men will increase rapidly. The projections for an

eISSN: 2354-0265, ISSN: 2353-6942

increase in the incidence of the disease are worrying, and it is therefore necessary to increase men's health education activities [8].

One of the reasons for the late detection of PCa is men's low awareness of the need for preventive screening. It is important that information on risk factors, symptoms, diagnosis and treatment of PCa is reliable and structured [6]. When taking preventive action with the male population, it is important to raise awareness of the importance of leading a healthy lifestyle. Dietary changes, prevention of obesity, reduction of animal fat intake, increased intake of plant products, especially soya and lycopene, products containing selenium, vitamin A, E and D, as well as increased physical activity and a hygienic lifestyle, significantly reduce the risk of the disease [1,6,9-11].

Secondary prevention, which aims to detect lesions at the earliest possible stage, as well as pre-cancerous conditions, is of primary importance in the control of PCa. Constant health monitoring enables early detection of dangerous changes and effective treatment [1]. For PCa, the recommended diagnostic tests used for screening are the serum Prostate Specific Antigen (PSA) test and a digital rectal examination. It is assumed that after the age of 40 the risk of prostate lesions increases [12] and this is confirmed by MRN data [4], therefore it is assumed that every man over the age of 50 should have his PSA antigen level determined once a year [13,14]. In addition to screening, it is very important to educate the patient about PCa, the causes and symptoms of the disease and the importance of follow-up examinations. Therefore, it is crucial to create awareness in men of all ages in promoting health and preventing many diseases. Of great importance in the prevention of PCa are the conditions in which the examination is carried out and the atmosphere surrounding the examination. Positive patient experience will result in increased regularity of testing [15-17].

eISSN: 2354-0265, ISSN: 2353-6942

In order to effectively reduce the number of deaths, it is necessary not only to look for new and more effective cancer treatments, but above all to develop reliable prevention programs. Raising awareness and knowledge of PCa will help prevent preventable deaths among men.

Research on the level of men's knowledge of PCa and preventive activities in this area is important in terms of organized cancer prevention activities in Poland. The incidence projections are alarming and the predicted further increase in incidence requires greater emphasis on effective male education and prevention. This is the only pathway that can lead to improved cancer outcomes.

Aim of the work

The aim of this study was to assess men's awareness of PCa and the subsequent occurrence of death as a result of late diagnosis and the role of preventive measures in the opinion of the men surveyed. Knowledge of risk factors and symptoms of the disease was analyzed in detail. In addition, knowledge of PCa prevention programs was assessed and factors influencing men's level of participation in these programs were characterized.

Material and methods

Due to the fact that the Masovian Province occupied the first place in terms of the number of registered new incidences of malignant neoplasms in general; the percentage was 12.2% of all incidences of malignant neoplasms and the first place in terms of the number of deaths due to malignant neoplasms; the percentage was 13.4% of all deaths due to malignant

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neoplasms in Poland in 2021. The survey was conducted in health care facilities in the Wołomin district.

The research was conducted from February to June 2023. A proprietary survey questionnaire was used to collect the material, using the diagnostic survey method. The authors' initial aim was to survey 150 men, but 106 correctly completed questionnaires were received. The study group consisted of men who met the following criteria: age 40 years or older (as screening guidelines suggest starting screening at this age), residence in the Wołomin District of the Masovian Province and consent to participate in the study.

A proprietary survey questionnaire was used as the tool. The general part of the questionnaire concerned the sociodemographic characteristics of the study group. The detailed part concerned knowledge of the types of preventive tests dedicated to PCa, the declared level of participation in these tests, an assessment of the accessibility of the tests, the obstacles present to taking the tests in the opinion of the respondents, and knowledge of risk factors, symptoms and openness to educational activities. The research was conducted in accordance with the principles of the Declaration of Helsinki [18] and was voluntary and anonymous. The respondents were informed about the purpose of the study and the possibility of resigning at any stage.

The results obtained were statistically analyzed using the χ^2 test. A significance level of $p<0.05$ was adopted. In addition, the relationship strength (r_p) was determined.

eISSN: 2354-0265, ISSN: 2353-6942

Results

In the study group, 31.13% (n=33) of the men were in the 60-69 age range, 26.42% (n=28) were aged 50-59 years, 25.47% (n=27) were aged 40-49 years and 16.98% (n=18) were aged over 70 years. The vast majority of people – 47.17% (n=50) had vocational education. Secondary education was held by 25.47% (n=27) of the men and higher education by 16.98% (n=18). Having primary education was declared by only 10.38% (n=11) of the respondents. More than half of the respondents were economically active men (53.77%; n=57), followed by retired persons/disability pensioners (46.23%; n=49).

Given the purpose of the study, it seemed appropriate to find out how men understood the role of preventive measures. Encouragingly, nearly 80% of the total number of men surveyed correctly identified disease prevention. For the vast majority (nearly 73%), PCa represented a serious, fatal disease.

Knowledge of PCa detection methods is crucial for prevention, as it allows men to undergo tests as recommended. Transrectal ultrasound of the prostate was known to nearly 50% of the respondents, about 46% had knowledge of the use of prostate-specific marker (PSA) level determination. The least known was the digital rectal (through the anus) examination. Only 28% of men were aware of such a test as a primary diagnostic procedure for PCa.

Of the social programs and campaigns in the field of PCa prevention, only the national educational program ‘I’ve got a hook for cancer’ was known to the respondents, which was indicated by 10% of the men. Unfortunately, the vast majority (76%) were not aware of any of the prevention programs mentioned, only 4% of those surveyed had ever participated in them.

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Knowing the symptoms of PCa is one of the basic pieces of information worth highlighting in educational activities. This makes it possible to detect the disease at the earliest possible stage of tumor progression, effectively improving treatment conditions and prognosis. The study found that nearly half of the men surveyed were familiar with the symptoms of PCa. As symptoms that may indicate a developing disease process, the respondents mainly indicated: frequent urination, especially at night (45%), intermittent urine stream (35%), low force with which the urine stream flows (34%) and longer time needed to start emptying the bladder (32%).

The incidence of PCa is influenced by a number of risk factors. The study identified an insufficient level of knowledge in this area among men. Most of them (75%) were not aware of the PCa inheritance problem. Respondents identified frequent inflammation of the urinary tract (42%), smoking (31%) and alcohol abuse (20%) as the most important risk factors. Only 14% of respondents pointed to an inadequate diet, poor in fruit and vegetables, as one of the main factors preventing PCa.

Male respondents were asked about their sources of information on PCa. The largest group of respondents mentioned family and friends (39%). The group of doctors and nurses who are expected to carry out educational activities was indicated by very few respondents (31% and 19% respectively). The smallest group mentioned meetings organized as part of PCa prevention (less than 1%), indicating the low effectiveness of the activities carried out.

Oncological vigilance for PCa consists of preventive examinations performed at the appropriate time in life. Of the men surveyed, only 40% indicated correctly – at 50 years of age – as the recommended time to start them. It was important to find out how men rated the accessibility to testing in their place of residence. Only a small group (15%) rated access as good enough.

eISSN: 2354-0265, ISSN: 2353-6942

The vast majority of men (89%) understand the importance of preventive examinations in terms of caring for their own health and being able to prevent prostate cancer. Despite this, as many as 60 per cent of respondents have not yet been tested for PCa. The main factor discouraging men from seeking preventive examinations appeared to be a perceived sense of embarrassment during the examination, as indicated by almost 50% of respondents.

In the material discussed, men showed great interest in participating in educational activities on PCa (75% of respondents), which indicates awareness of the insufficient level of knowledge in this area. From a public health perspective, it is important to address the problem of inadequate self-monitoring of men's health. It is necessary to encourage participation in educational activities and, above all, access to preventive programs and knowledge about their implementation.

The relationships, their strength and statistical significance between the studied variables are presented in Table 2.

Table 2. Selected relationships between studied variables determining the level of men's knowledge about prostate cancer and its conditions as well as the possibilities of preventive measures.

Dependent variable versus independent variable	Strength of relationship subscript
Respondents' opinion of the disease depending on age	$\chi^2_{obl.}=58.4078 > \chi^2_{6;0.001}=22.4578$, $r_p=0.596$
Level of participation in preventive examinations depending on age	$\chi^2_{obl.}=13.5347 > \chi^2_{6;0.05}=12.5916$, $r_p=0.336$
Level of knowledge about the genetic background of prostate cancer depending on age	$\chi^2_{obl.}=18.7134 > \chi^2_{6;0.01}=16.8119$, $r_p=0.387$
Men's level of awareness of prostate cancer death rates depending on age	$\chi^2_{obl.}=23.2163 > \chi^2_{6;0.001}=22.4578$,

eISSN: 2354-0265, ISSN: 2353-6942

	r_p=0.559
Assessment of accessibility to preventive examinations in the place of residence depending on age	$\chi^2_{obl.}$=16.3107 > $\chi^2_{6;0.05}$=12.5916, r_p=0.365
Participation in prevention programs depending on the level of education	$\chi^2_{obl.}$=41.8557 > $\chi^2_{6;0.001}$=22.4578, r_p=0.532
Knowledge of the recommended age for prostate cancer testing depending on the level of education	$\chi^2_{obl.}$=39.1883 > $\chi^2_{9;0.001}$=27.8772, r_p=0.52
Opinion on factors discouraging the use of preventive tests depending on the level of education	$\chi^2_{obl.}$=19.1682 > $\chi^2_{6;0.01}$=16.8119, r_p=0.391
Opinion on the role of preventive examinations in cancer prevention depending on the level of education	$\chi^2_{obl.}$=23.5538 > $\chi^2_{3;0.001}$=16.2663, r_p=0.426

A statistically significant relationship of 0.001 (high relationship strength) was found between the respondents' opinion of the disease and their age. Younger men were less likely to describe PCa as a fatal disease, while the older the age group, the more often this opinion was declared.

As expected, male participation in PCa prevention programmes and campaigns was negligible. The relationship between respondents' participation and age was found to be statistically significant at the level of 0.05 (average relationship strength). The older the age group, the greater the percentage of men who 'never participated'.

The analysis showed that the respondents had a very low level of knowledge about the genetic background of PCa. It was observed that this was more often the case for people in

eISSN: 2354-0265, ISSN: 2353-6942

older age groups. Statistically significant relationship at the level of 0.01 (average relationship strength).

A significant relationship between age and the assessment of accessibility to preventive examinations in the place of residence was confirmed at a significance level of 0.05 (average relationship strength). Men in older age groups assessed access to preventive tests poorly more often than in younger age groups.

A similar direction of relationship was observed between the level of participation in such programmes and education. The lower the level of education, the higher the percentage of 'non-participants'. The observed relationship occurs at a significance level of 0.001 (high relationship strength).

A statistically significant relationship was also found between knowledge of the recommended age for PCa testing and education. Respondents with higher education were more likely to indicate the correct answer than respondents with secondary and, in turn, primary education. Statistically significant relationship at the level of 0.001 (high relationship strength).

A significant relationship was also found between the education of the surveyed men and their opinion on factors discouraging the use of preventive PCa tests. As already mentioned, the most frequently indicated factor was the feeling of shame during the examination. The lower the level of education, the higher the percentage of respondents giving this opinion. The observed relationship occurs at a significance level of 0.01 (average relationship strength).

The result of the chi-square test confirmed a significant relationship between education and opinion, on the role of preventive screening in the prevention of PCa (significance level of 0.001 – average relationship strength). Respondents with higher education were more

eISSN: 2354-0265, ISSN: 2353-6942

likely to confirm the effectiveness of prevention measures than respondents with secondary and successively primary education.

Discussion

The aim of the presented study was to determine the state of men's knowledge of PCa and preventive measures in this area. Analyzing the available literature, it can be concluded that this is not a topic that is often addressed in studies. The validity of the adopted age limit for male participation in the study at 40 years and older is confirmed by other studies [19-23]. A study by Howlade et al. found that approximately 0.6% of PCa cases were diagnosed between 35 and 44 years of age; 9.7% between 45 and 54 years of age; 32.7% between 55 and 64 years of age; 36.3% between 65 and 74 years of age; 16.8% between 75 and 84 years of age; and 3.8% for 85 years and older [24].

In the conducted study, nearly 75% of men assessed their knowledge of PCa detection as insufficient and declared their willingness to improve it. The above finding correlates with the conclusions of the study by Deluga et al. where it was shown that, in the overall assessment of knowledge of PCa risk factors, an average level of knowledge was presented by 42.7% of respondents, a high level of knowledge by 37.3% and a low level of knowledge by 20.0% [25].

Studies show that PSA screening reduces mortality in PCa [26-28]. The men surveyed were aware of how serious and deadly a disease PCa is. Despite this knowledge, nearly 60% of the men taking part in the survey had never had a PCa prevention test. In a study by Sosnowski et al. almost 30% of men did not perceive periodic prostate examinations as preventing complications and enabling early implementation of appropriate treatment [29]. In

eISSN: 2354-0265, ISSN: 2353-6942

contrast, a study by Morlando et al. found that only 29.6% of men had undergone PSA testing and 59.4% were willing to do so in the future [30]. The proportion of participants in a study conducted in Portugal who had undergone PCa screening at least once in their lifetime was 44.2% [31].

The literature shows that pain is the most common symptom reported by male PCa patients [32,33]. The study by Ngowi et al. [34] reports that men have low knowledge of PCa, including knowledge of the discomforts that accompany the developing PCa disease process. The results of a review of forty-two articles indicated that many African Americans have inadequate knowledge about PCa and its early detection [35]. The results of the following study confirmed the authors' observed low level of male knowledge of PCa symptoms and low awareness of the risk of death. Nearly half of the respondents could not identify any of the symptoms.

The authors of this study indicated that only 9% of respondents confirmed knowledge of at least one PCa prevention programme, and only 4% of men had participated in a prevention programme. The majority of men understood the importance of preventive screening, despite this, as many as 60% of them did not undergo a PCa test. Similar data emerged from the Nationale-Nederlanden report [36], where more than 70% of respondents considered preventive examinations important, but only one in four men performed them.

Reporting men with symptoms of prostate disease to a doctor is still considered shameful and embarrassing. Bania suggest that male PCa survivors experience internalized stigma, as well as stigmatization from those close to them, such as family or community members; however, the topic of stigma remains under-researched [37]. Research shows that men experienced feelings of shame in different ways and under different circumstances. The diagnosis of PCa itself has been described as causing discomfort among men when they went

eISSN: 2354-0265, ISSN: 2353-6942

to hospital [38], when other men did not believe they were ill [39]. This made men ashamed to admit their illness to others because they did not fit the traditional model of a ‘sick person’. They also experienced worthlessness due to their inability to work, being deprived of the dominant male role to which they were accustomed [40]. Ettridge et al. [41] highlighted that patients with PCa do not seek social support because of the expected awkwardness, unwanted sympathy and stress. Moreover, these factors can undermine meaningful patient relationships and consequently promote isolation [41]. Perceived discomfort with a digital rectal examination and fear of intrusion into their privacy and body and masculinity has been identified as one of the most important factors associated with low participation in screening, particularly among black men [42]. The results of our own study confirmed the correlations observed by the authors that men are reluctant to undergo prostate examinations most often due to a sense of shame.

The analysis of the survey shows that the main source of knowledge about PCs was family and friends (39%). The above finding correlates with studies by other authors [43-45]. A group of doctors and nurses as health educators for PCa prevention were cited by 31% and 19% of respondents, respectively. The insights gained in this part of the study regarding the involvement of health system staff in men’s education are confirmed by the literature [46-48].

Findings from the study showed that health education programs can positively influence preventive behaviors for PCa, by increasing the level of knowledge among men and also having a positive impact on perceived susceptibility and severity, as well as considering perceived barriers, benefits and health motivations, which has been confirmed in other studies [49,50].

eISSN: 2354-0265, ISSN: 2353-6942

Limitations of the research

It is important to mention some limitations of our study, which should be kept in mind when interpreting the results. Firstly, the sample selected cannot adequately represent the wider population due to the fact that it was based on the opinions of 106 respondents. Secondly, all participants resided in the Wołomin district of the Masovian Province; therefore, the results of the study cannot be generalized to other districts, and provinces or the entire country. Thirdly, data for the study were only obtained from a sample consisting of men over 40 years of age who consented to participate in the study. Future studies should consider a larger research sample while using standardized tools. Repeating the study in different contexts will allow the role of other psychosocial variables that may influence these relationships to be explored, thus deepening the understanding of the phenomenon under study. The study provides important information for the design and implementation of prostate cancer prevention and control programs, with appropriate consideration of the study context.

Conclusions

The following conclusions can be drawn from the results of the study:

1. Men's awareness of prostate cancer is low, with many men aware of the seriousness of the problem but doing nothing to prevent the disease and detect it early, thus avoiding death as a result.

eISSN: 2354-0265, ISSN: 2353-6942

2. It is reasonable to coordinate the activities of entities operating in the field of public health in the implementation of educational programs aimed at preventing prostate cancer among men.
3. An opportunity to reduce mortality among men from prostate cancer is to increase men's awareness of the role and importance of preventive screening. Doctors and nurses in primary care, occupational medicine as well as those in their social environment should be more involved in prevention activities.

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References:

1. Wolnicka K. The role of nutrition in oncological prevention. NOWOTWORY J Oncol. 2024; 74: 57-65. https://doi.org/10.5603/njo.98446.
2. Sung H, Ferlay J, Siegel RL, Laversanne M, Soerjomataram I, Jemal A, et al. Global cancer statistics 2020: GLOBOCAN estimates of incidence and mortality worldwide for 36 cancers in 185 countries. CA: A Cancer Journal for Clinicians. 2021; 71(3): 209-249. https://doi.org/10.3322/caac.21660.

eISSN: 2354-0265, ISSN: 2353-6942

3. National Cancer Register. Raports [Internet]. Warsaw: National Cancer Register [access 2024 Feb 26]. Available from: https://onkologia.org.pl/pl/raporty (in Polish).
4. Sulkowska U, Michałek I, Wojciechowska U, Olasek P, Orzechowska M, Natkańska S, et al. Cancer in mazowieckie voivodeship in 2021 [Internet]. Warsaw: PMaria Sklodowska-Curie National Research Institute of Oncology; 2023 [access 2024 Feb 26]. Available from: http://mrn.pib-nio.pl/wp-content/uploads/2024/01/MRN-2023.pdf (in Polish).
5. Pyun JH, Ko YH, Kim SW, Son N-H. The Short- and long-term anticipation of prostate cancer incidence in Korea: based on social aging trends and prostate-specific antigen testing rate during the last decade. Cancers. 2024; 16(3): 503. https://doi.org/10.3390/cancers16030503
6. Rawla P. Epidemiology of prostate cancer. World J Oncol. 2019; 10(2): 63-89. https://doi.org/10.14740/wjon1191
7. Malik SS, Batool R, Masood N, Yasmin A. Risk factors for prostate cancer: a multifactorial case-control study. Curr. Probl. Cancer. 2018; 42: 337-343. https://doi.org/10.1016/j.currproblcancer.2018.01.014
8. Jung KW, Won YJ, Kang MJ, Kong HJ, Im JS, Seo HG. Prediction of cancer incidence and mortality in Korea, 2022. Cancer Research and Treatment: Official Journal of Korean Cancer Association. 2022; 54(2): 345-351. https://doi.org/10.4143/crt.2022.179
9. GBD 2019 Cancer Risk Factors Collaborators. The global burden of cancer attributable to risk factors, 2010-19: a systematic analysis for the Global Burden of Disease Study 2019. Lancet. 2022; 400(10352): 563-591. https://doi.org/10.1016/S0140-6736(22)01438-6

eISSN: 2354-0265, ISSN: 2353-6942

10. Oczkowski M, Dziendzikowska K, Pasternak-Winiarska A, Włodarek D, Gromadzka-Ostrowska J. Dietary factors and prostate cancer development, progression, and reduction. Nutrients. 2021; 13(2): 496. https://doi.org/10.3390/nu13020496
11. Matsushita M, Fujita K, Nonomura N. Influence of diet and nutrition on prostate cancer. Int J Mol Sci. 2020; 21(4): 1447. https://doi.org/10.3390/ijms21041447
12. Wang K, Chen X, Bird VY, Gerke TA, Manini TM, Prosperi M. Association between age-related reductions in testosterone and risk of prostate cancer – an analysis of patients' data with prostatic diseases. International Journal of Cancer. 2017; 141(9): 1783-1793. https://doi.org/10.1002/ijc.30882
13. Carlsson S, Assel M, Ulmert D, Gerdtsson A, Hugosson J, Vickers A, et al. Screening for prostate cancer starting at age 50-54 years. A population-based cohort study. European Urology. 2017; 71(1): 46-52. https://doi.org/10.1016/j.eururo.2016.03.026
14. Parker C, Castro E, Fizazi K, Heidenreich A, Ost P, Procopio G, et al. Prostate cancer: ESMO Clinical Practice Guidelines for diagnosis, treatment and follow-up. Annals of Oncology. 2020; 31(9): 1119-1134. https://doi.org/10.1016/j.annonc.2020.06.011
15. Bhuyan SS, Chandak A, Gupta N, Isharwal S, LaGrange C, Mahmood A, et al. Gentry D. Patient–provider communication about prostate cancer screening and treatment: new evidence from the Health Information National Trends Survey. American Journal of Men's Health. 2017; 11(1): 134-146. https://doi.org/10.1177/1557988315614082
16. Saman DM, Harry ML, Freitag LA, Allen CI, O'Connor PJ, Sperl-Hillen JM, et al. Patient perceptions of using clinical decision support for cancer screening and prevention: "I wouldn't have thought about getting screened without it.". J Patient Cent Res Rev. 2021; 8(4): 297-306. https://doi.org/10.17294/2330-0698.1863

eISSN: 2354-0265, ISSN: 2353-6942

17. Kannan A, Kirkman M, Ruseckaite R, Evans SM. Prostate cancer awareness, case-finding, and early diagnosis: interviews with undiagnosed men in Australia. PLoS One. 2019; 14(3): e0211539. https://doi.org/10.1371/journal.pone.0211539
18. World Medical Association. Declaration of Helsinki. JAMA. 2013; 310(20): 2191. https://doi.org/10.1001/jama.2013.281053
19. Gift S, Nancy K, Victor M. Assessment of knowledge, practice and attitude towards prostate cancer screening among male patients aged 40 years and above at Kitwe Teaching Hospital, Zambia. African Journal of Urology. 2020; 26(70): 1-7. https://doi.org/10.1186/s12301-020-00067-0
20. Ukoli FA, Patel K, Hargreaves M, Beard K, Moton PJ, Bragg R, et al. A tailored prostate cancer education intervention for low-income African Americans: impact on knowledge and screening. Journal of Health Care for the Poor and Underserved. 2013; 24(1): 311-331. https://doi.org/10.1353/hpu.2013.0033
21. Bilgili N, Kitiş Y. Prostate cancer screening and health beliefs: a Turkish study of male adults. J Clin Pract Res. 2019; 41(2): 164-169. https://doi.org/10.14744/etd.2019.45762
22. Asare BY, Ackumey MM. Awareness and knowledge about prostate cancer among male teachers in the Sunyani Municipality, Ghana. Afr Health Sci. 2021; 21(2): 655-662. https://doi.org/10.4314/ahs.v21i2.22
23. Ojewola RW, Oridota ES, Balogun OS, Ogundare EO, Alabi TO, Banjo OO, et al. Knowledge, attitudes and screening practices regarding prostatic diseases among men older than 40 years: a population-based study in Southwest Nigeria. Pan Afr Med J. 2017; 27: 151. https://doi.org/10.11604/pamj.2017.27.151.10605
24. Howlader N, Noone AM, Krapcho M, Miller D, Bishop K, Kosary CL, et al. SEER Cancer Statistics Review, 1975-2014 [Internet]. Bethesda, MD: National Cancer

eISSN: 2354-0265, ISSN: 2353-6942

Institute; 2018 [access 2024 Feb 22]. Available from: https://seer.cancer.gov/csr/1975_2014/

25. Deluga A, Ślusarska B, Belmas E, Charzyńska-Gula M. [Men's knowledge on risk factors of prostate cancer]. Probl Hig Epidemiol. 2015; 96(4): 757-762 (in Polish).
26. Kohestani K, Chilov M, Carlsson SV. Prostate cancer screening-when to start and how to screen?. Transl Androl Urol. 2018; 7(1): 34-45. https://doi.org/10.21037/tau.2017.12.25
27. Stattin P, Vickers AJ, Sjoberg DD, Johansson R, Granfors T, Johansson M, et al. Improving the specificity of screening for lethal prostate cancer using prostate-specific antigen and a panel of kallikrein markers: a nested case-control study. Eur Urol. 2015; 68(2): 207-13. https://doi.org/10.1016/j.eururo.2015.01.009
28. Carlsson S, Assel M, Ulmert D, Gerdtsson A, Hugosson J, Vickers A, et al. Screening for prostate cancer starting at age 50-54 years. A population-based cohort study. European Urology. 2017; 71(1): 46-52. https://doi.org/10.1016/j.eururo.2016.03.026
29. Sosnowski R, Kuczkiewicz O, Moskal K, Kuncewicz P. [Assessing men's knowledge of lower urinary tract symptoms]. Przegląd Urologiczny. 2017; 5(105) (in Polish).
30. Morlando M, Pelullo CP, Di Giuseppe G. Prostate cancer screening: knowledge, attitudes and practices in a sample of men in Italy. A survey. PloS One. 2017; 12(10): e0186332. https://doi.org/10.1371/journal.pone.0186332.
31. Braga R, Costa AR, Pina F, Moura-Ferreira P, Lunet N. Prostate cancer screening in Portugal: prevalence and perception of potential benefits and adverse effects. Eur J Cancer Prev. 2020; 29(3): 248-251. https://doi.org/10.1097/CEJ.0000000000000539

eISSN: 2354-0265, ISSN: 2353-6942

32. Snijders RAH, Brom L, Theunissen M, van den Beuken-van Everdingen MHJ. Update on prevalence of pain in patients with cancer 2022: a systematic literature review and meta-analysis. Cancers. 2023; 15(3): 591. https://doi.org/10.3390/cancers15030591
33. Sanford NN, Sher DJ, Butler SS, Xu X, Ahn C, Aizer AA, et al. Prevalence of chronic pain among cancer survivors in the United States, 2010-2017. Cancer. 2019; 125(23): 4310-4318. https://doi.org/10.1002/cncr.32450
34. Ngowi BN, Mremi A, Mbwambo OJ, Mitao MP, Nyindo M, Mteta KA, et al. Prostate cancer knowledge and barriers to screening among men at risk in northern Tanzania: a community-based study. Cancer Treatment and Research Communications. 2024: 100811. https://doi.org/10.1016/j.ctarc.2024.100811
35. Coughlin SS, Vernon M, Klaassen Z, Tingen MS, Cortes JE. Knowledge of prostate cancer among African American men: a systematic review. The Prostate. 2021; 81(3): 202-213. https://doi.org/10.1002/pros.24097
36. Nationale-Nederlanden. [Cancer] [Internet]. [access 2024 Feb 26]. Available from: https://www.nn.pl/dam/jcr:2f1b848b-47c0-476b-87fb-69b948ef748f/Rak-Nationale-Nederlanden-Miej-serce-do-zdrowia-Raport-Zdrowotny.pdf (in Polish).
37. Ahmad MM, Musallam R, Allah AH, Al-Daken L, Abu-Snieneh H, Al-Dweik G. Maturity level of the stigma concept associated with cancer diagnosis in the nursing literature. Asian Pacific Journal of Cancer Prevention. 2018; 19(2): 479-485. https://doi.org/10.22034/APJCP.2018.19.2.479
38. Appleton L, Wyatt D, Perkins E, Parker C, Crane J, Jones A. The impact of prostate cancer on men's everyday life. Eur J Cancer Care (Engl). 2015; 24(1): 71-84. https://doi.org/10.1111/ecc.12233

eISSN: 2354-0265, ISSN: 2353-6942

39. Chambers SK, Lowe A, Hyde MK, Zajdlewicz L, Gardiner RA, Sandoe D, et al. Defining young in the context of prostate cancer. Am J Mens Health. 2015; 9(2): 103-114. https://doi.org/10.1177/1557988314529991

40. Ussher JM, Perz J, Rose D, Dowsett GW, Chambers S, Williams S, et al. Threat of sexual disqualification: the consequences of erectile dysfunction and other sexual changes for gay and bisexual men with prostate cancer. Arch Sex Behav. 2017; 46(7): 2043-2057. https://doi.org/10.1007/s10508-016-0728-0

41. Ettridge KA, Bowden JA, Chambers SK, Smith DP, Murphy M, Evans SM, et al. "Prostate cancer is far more hidden…": Perceptions of stigma, social isolation and help-seeking among men with prostate cancer. European Journal of Cancer Care. 2017; 27(2): e12790. https://doi.org/10.1111/ecc.12790

42. Ogunsanya ME, Brown CM, Odedina FT, Barner JC, Corbell B, Adedipe TB. Beliefs regarding prostate cancer screening among black males aged 18 to 40 years. American Journal of Men's Health. 2017; 11(1): 41-53. https://doi.org/10.1177/1557988316637879

43. Bansal A, Koepl LM, Fedorenko CR, Li C, Smith JL, Hall IJ, et al. Information seeking and satisfaction with information sources among spouses of men with newly diagnosed local-stage prostate cancer. J Canc Educ. 2018; 33: 325-331. https://doi.org/10.1007/s13187-017-1179-6

44. Hicks EM, Litwin MS, Maliski SL. Latino men and familial risk communication about prostate cancer. Oncol Nurs Forum. 2014; 41(5): 509-516. https://doi.org/10.1188/14.ONF.509-516

eISSN: 2354-0265, ISSN: 2353-6942

45. Okoro ON, Rutherford CA, Witherspoon SF. Leveraging the family influence of women in prostate cancer efforts targeting African American men. J. Racial and Ethnic Health Disparities. 2018; 5: 820-830. https://doi.org/10.1007/s40615-017-0427-0
46. Martinez-Lopez N, Makarov DV, Thomas J, Ciprut S, Hickman T, Cole H, et al. A study to compare a CHW-Led versus physician-led intervention for prostate cancer screening decision-making among black men. Ethnicity & Disease. 2023; 33(1): 26-32. https://doi.org/10.18865/1722
47. Pucheril D, Fletcher SA, Zlatev DV, Mossanen M, Ingham MD, Chang SL, et al. Shared decision making for prostate cancer screening: Reality or farce?. JCO. 2018; 36: 107-107. https://doi.org/10.1200/JCO.2018.36.6_suppl.107
48. Bennett C, Davis ID, Hamid AA. Nursing implications of recent changes in management practices for metastatic prostate cancer. Seminars in Oncology Nursing. 2020; 36(4): 151047. https://doi.org/10.1016/j.soncn.2020.151047
49. Molazem Z, Ebadi M, Khademian M, Zare R. Effects of an educational program for prostate cancer prevention on knowledge and psa testing in men over 50 years old in community areas of Shiraz in 2016. Asian Pac J Cancer Prev. 2018; 19(3): 633-637. https://doi.org/10.22034/APJCP.2018
50. Zare M, Ghodsbin F, Jahanbin I, Ariafar A, Keshavarzi S, Izadi T. The effect of health belief model-based education on knowledge and prostate cancer screening behaviors: a randomized controlled trial. Int J Community Based Nurs Midwifery. 2016; 4(1): 57-68.