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SOCIODEMOGRAPHIC CHARACTERISTICS AND SMOKING-RELATED HABITS AMONG PARTICIPANTS IN A LUNG CANCER SCREENING PROGRAM IN VOJVODINA, SERBIA

SOCIODEMOGRAFSKE KARAKTERISTIKE I NAVIKE U VEZI SA PUŠENJEM UČESNIKA SKRININGA ZA RANO OTKRIVANJE RAKA PLUĆA U VOJVODINI, SRBIJA

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Summary

Introduction. Lung cancer ranks as the second most common cancer among women and the leading cancer among men in Serbia. This study aimed to analyze smoking-related habits among participants in a lung cancer screening program. **Material and Methods.** The cross-sectional study was conducted between September 29, 2020 and June 9, 2023. Relevant database records containing information on socio-demographic characteristics of patients treated at the Primary Healthcare Center Novi Sad were analyzed. Socio-demographic characteristics (age, gender, level of formal education), and smoking related habits, were obtained through an electronic questionnaire, specially designed for the purpose of the project. **Results.** Out of 2,460 respondents, 58.9% were females. The average age of the respondents was 63.7±6.8 years. The majority of the participants were smokers (83.3%). Nearly half (48.7%) considered quitting smoking in the previous six months, while 24% considered smoking cessation within the next 30 days. Participants frequently concerned about the risk of lung cancer development were more willing to quit smoking compared to those less concerned (33.3% vs. 16.2%, $p < 0.001$). **Conclusion.** The study concludes that there is a low level of personal decisions to quit smoking, concern for one's health and insufficient awareness of the risks of lung cancer development. Physicians working in the primary healthcare settings should take a more proactive role in smoking cessation initiatives.

Key words: Lung Neoplasms; Primary Health Care; Smoking; Habits; Mass Screening; Demography; Health Knowledge, Attitudes, Practice

Introduction

Lung cancer (LC) ranks among the most prevalent neoplasms globally, with 2 million cases reported annually worldwide, leading to 1.7 million deaths [1, 2]. Smoking cessation is commonly integrated into international and national initiatives aimed at preventing malignant diseases due to the strong correlation between LC and smoking. Tobacco control is recognized as a significant measure

Sažetak

Uvod. Karcinom pluća je na drugom mestu po učestalosti karcinoma kod žena, a najčešći je kod muškaraca u Republici Srbiji. Cilj istraživanja bio je analiziranje navika (aktuelne i bivše) u vezi sa pušenjem kod učesnika skrining programa na karcinom pluća. **Materijal i metode.** Istraživanje je sprovedeno u vidu studije preseka u periodu 29. 9. 2020–9. 6. 2023. godine. Skrining karcinoma pluća primenom *low-dose computed tomography* sprovodi se u Institutu za plućne bolesti Vojvodine, a u odabir ispitanika za skrining uključen je Dom zdravlja Novi Sad. Za potrebe ovog skrining programa kreirana je baza podataka. Demografski podaci o starosti, polu, nivou formalnog obrazovanja, kao i o faktorima u vezi sa pušenjem prikupljeni su pomoću onlajn upitnika, dizajniranog za potrebe ovog skrininga. **Rezultati.** U istraživanju je učestvovalo 2.460 ispitanika (58,9% ženskog pola), prosečne starosti 63,7 ± 6,8 godina. Većina ispitanika bili su pušači (83,3%). Ukupno 48,7% je razmatralo mogućnost prestanka pušenja u prethodnih šest meseci, a u narednih mesec dana 24% nameravalo je da prestane sa pušenjem. Pacijenti koji su često ili vrlo često bili zabrinuti zbog rizika od karcinoma pluća bili su spremniji da ostave cigarete u odnosu na one koji to nisu (33,3% prema 16,2%), $p < 0,001$. **Zaključak.** Utvrđen je nizak stepen lične odluke ispitanika za prestanak pušenja, kao i nedovoljno razvijena svest o riziku za nastanak karcinoma pluća. Pilot projekat za skrining karcinoma pluća trebalo bi proširiti na područje cele države, a lekari primarne zdravstvene zaštite treba da imaju aktivniju ulogu u odvikavanju od pušenja kod svih osoba.

Ključne reči: tumori pluća; primarna zdravstvena zaštita; pušenje; navike; skrining; demografija; znanje o zdravlju, stavovi, praksa

in LC prevention. Various screening programs have been devised to target adults of varying ages, regardless of their smoking status, primarily focusing on individuals at heightened risk for LC development. The objective is to enable early detection and prompt initiation of treatment, thereby mitigating mortality [3–10]. The European action plan to combat cancer sets the target of reducing tobacco use in the general population to under 5% by 2040 [11, 12]. Low-dose computed tomography (LDCT) has been

Abbreviations

LC	– lung cancer
LDCT	– low-dose computed tomography
PY	– pack-years
CT	– computed tomography
BMI	– body mass index

utilized in LC screening worldwide for decades, with the aim of achieving the same goal [2, 13–16].

According to the Serbian Cancer Registry of the Institute of Public Health of Serbia, “Dr. Milan Jovanovic Batut”, there were 6,863 new LC cases (2,069 in women and 4,794 in men) registered in 2019, making it the second most common cancer among women (10.5%) and the most common cancer among men (21.3%) in Serbia [17, 18]. These concerning statistics were confirmed by an observational study based on hospital registry data from the Institute for Pulmonary Diseases of Vojvodina for the period spanning 2011 to 2020. The number of diagnosed lung cancers in Vojvodina had increased compared to the preceding decade, with a significantly higher incidence in females [19]. In an effort to reverse these trends, LC screening using LDCT was launched at the Institute for Pulmonary Diseases of Vojvodina in September 2020. The Primary Healthcare Center Novi Sad was included in the selection of subjects for the screening program, and the results obtained thus far have been published in several papers [20, 21].

Daily interaction with patients plays a very important role in motivating them to quit smoking and sustaining abstinence. The objective of this study was to analyze smoking-related habits among participants in the LC screening program.

Material and Methods

The cross-sectional study was conducted from September 29, 2020 to June 9, 2023. Relevant database records containing information on the socio-demographic characteristics of patients treated at the Primary Healthcare Center Novi Sad were analyzed. The research was approved by the Ethics Committee of the Primary Healthcare Center Novi Sad (Decision number: 21/32-1) as a part of the pilot project titled “Early Detection of Lung Cancer”.

During the observed period, records of 2,460 participants were included in the database. Written informed consent was provided to all participants by their designated physicians during regular health visits, with a compliance rate of 100%.

Socio-demographic characteristics (age, gender, level of formal education) and smoking-related habits were assessed using an electronic questionnaire specifically designed for the project.

Only individuals meeting the following inclusion criteria were eligible for participation: (1) age between 50 and 74 years, active smoker with a smoking history of ≥ 30 years, consuming one or more packs per day (equivalent to 30 pack-years (PY) calculated by dividing the number of cigarettes smoked per day by 20 and multiplying the result by the number of years of smok-

ing [22]); or (2) age between 50 and 74 years, active smoker with a smoking history of ≥ 20 years, consuming one or more packs per day (equivalent to 20 PY), and having one or more associated risk factors: chronic lung disease, previous cancer diagnosis (established more than five years ago and no longer under follow-up), family history of lung cancer, or occupational exposure to carcinogenic substances; or (3) age between 50 and 74 years, former smoker who quit smoking 1 to 10 years prior to the screening, with the same risk factors as active smokers mentioned above, but without the symptoms or signs of lung cancer.

The final sample was formed by applying the following exclusion criteria: age below 50 or above 74; cessation of smoking for more than 10 years; regular lung CT findings within the past 12 months; previous lung cancer diagnosis (as these individuals are covered by a special monitoring system); continuous use of a home oxygen concentrator; presence of other comorbidities in an advanced stage, such as advanced liver disease, chronic obstructive pulmonary disease (COPD) with hypoventilation and hypoxia, or congestive heart failure (New York Heart Association stage IV), where the expected length of survival due to the underlying disease limits the potential benefits of screening.

Differences between categorical variables were assessed using the Chi-squared test, while one-way ANOVA was employed to test differences between groups. Quantitative parameters were described as Mean (M) $\pm$ Standard Deviation (SD), while percentages and frequencies were reported for qualitative parameters. A probability level of $p \leq 0.05$ was considered statistically significant. All statistical analyses were conducted using the SPSS for Windows, version 24.0 (IBM Corp., Armonk, NY, USA).

Results

Out of 2,460 respondents, 41.1% were males and 58.9% females. The average age of the respondents was 63.7 ± 6.8 years. The average body mass of the respondents was 78.0 ± 17.6 kg, with an average height of 169.3 ± 9.8 cm. Among the participants, 44 (1.8%) were undernourished, 863 (35.2%) had normal weight, 1002 (40.8%) had increased body mass, and 546 (22.2%) were obese. The majority of the participants had a spouse or a cohabiting partner (1579 or 64.2%), 132 (5.4%) were single, 340 (13.8%) were divorced, and 409 (16.6%) were widows/widowers. In terms of educational level, 227 (9.2%) had completed primary school, 1673 (68.0%) had completed secondary school, 231 (9.4%) had higher education, and 306 (12.4%) participants had a university degree. Other forms of education were reported by 23 (0.9%) participants. In terms of employment status, 932 (37.9%) were employed, 310 (12.6%) were unemployed, 1188 (48.3%) were retirees, 30 (1.2%) were part time workers, and 30 (1.2%) were early retirees due to medical conditions. Over the last 20 years, 473 (19.2%) participants reported changing their place of residence, while remaining 1987 (80.8%) did not (**Table 1**).

Table 1. Sociodemographic characteristics of the participants
Tabela 1. Socio-demografske karakteristike ispitanika

Sex/Pol	N (%) / Br. (%)
Male/Muški	1,011 (41.1%)
Female/Ženski	1,449 (58.9%)
Age (years), M±SD (range)/Starost (godine), M±SD (raspon)	63.7±6.8
Body mass (kg), M±SD (range)/Telesna masa (kg), M±SD (raspon)	78.0±17.6 (37.0–191.0)
Height (cm), M±SD (range)/Visina (cm), M±SD (raspon)	169.3±9.8 (120.0–202.0)
BMI (kg/m ²) M±SD (range)/Indeks telesne mase (kg/m ²), M±SD (raspon)	27.1±5.2 (13.5–65.8)
BMI categories/BMI kategorije	N (%) / Br. (%)
≤ 18.5 (Underweight/Pothranjenost)	44 (1.8%)
18.5–24.9 (Healthy weight/Normalna telesna masa)	863 (35.2%)
25.0–29.9 (Overweight/Povećana telesna masa)	1,002 (40.8%)
≥ 30 (Obesity/Gojaznost)	546 (22.2%)
Marital status/Bračni status	N (%) / Br. (%)
Living with a partner (marital/extramarital)/Život u zajednici (bračni/vanbračni)	1,579 (64.2%)
Single/Neoženjen/neudata	132 (5.4%)
Divorced/Razveden/razvedena	340 (13.8%)
Widowed/Udovac/udovica	409 (16.6%)
Educational attainment/Nivo formalnog obrazovanja	N (%) / Br. (%)
Primary school/Osnovna škola	227 (9.2%)
Secondary school/Srednja škola	1,673 (68.0%)
Post-secondary vocational education/Viša škola	231 (9.4%)
University/Fakultet	306 (12.4%)
Other/Ostalo	23 (0.9%)
Current employment status/Trenutni radni status	N (%) / Br. (%)
Employed/Zaposlen	932 (37.9%)
Unemployed/Nezaposlen	310 (12.6%)
Retired/Penzioner	1,188 (48.3%)
Retired prematurely due to illness/Prevrmeno penzionisan zbog bolesti	30 (1.2%)
Change of residence in the last 20 years/Promena mesta boravka u poslednjih 20 godina	N (%) / Br. (%)
Yes/Da	473 (19.2%)
No/Ne	1,987 (80.8%)

Legend: N – number of participants; M – mean; SD – standard deviation; BMI – body mass index

Legenda: Br. – broj ispitanika; M – srednja vrednost; SD – standardna devijacija; BMI – indeks telesne mase

As shown in **Table 2**, during the 12 months preceding the survey, 351 (14.3%) participants underwent a chest X-ray, averaging 1.3±0.8 chest X-rays per participant, 32 (1.3%) had lung CT scan, averaging 1.2±0.8 CT scans per participant, and 138 (5.6%) underwent mammography. The average tobacco smoke exposure among participants was 21.8±12.4 years. Regarding tobacco smoking status, 2048 (83.3%) were smokers, 402 (16.3%) were ex-smokers, and 10 (0.4%) were non-smokers. The average number of years of smoking was 36.7±9.0 years, with an average number of cigarettes smoked per day of 22.0±7.9. The average PY value was 40.1±17.4 years. Among ex-smokers, the average number of years since smoking cessation was 7.6±7.0 years. Among the 2435 participants who reported the type of cigarettes smoked, 1986 (81.6%) smoked commercial cigarettes, 428 (17.5%) smoked hand-rolled cigarettes, 19 (0.8%) used e-cigarettes, and 2 (0.1%) smoked pipes. Regarding the option of quitting smok-

ing in the previous 6 months, 962 (48.7%) out of 1977 participants considered quitting, while 1015 (51.3%) did not. Regarding the intention to quit smoking in the next 30 days, 477 (24.0%) out of 1984 participants were affirmative about it. In terms of exposure to tobacco smoke during childhood/teenage years, 999 (40.6%) reported no exposure, 311 (12.7%) reported occasional exposure, 524 (21.3%) reported moderate exposure, and 626 (25.4%) reported frequent exposure. Regarding exposure to tobacco smoke during adulthood at work or at home 396 (16.1%) reported no exposure, 242 (9.9%) reported occasional exposure, 653 (26.5%) reported moderate exposure, and 1169 (47.5%) participants reported frequent exposure. Concerning the likelihood of developing lung cancer, 651 (26.5%) participants never worried, 362 (14.8%) rarely worried, 953 (38.7%) occasionally worried, 360 (14.6%) frequently worried, and 134 (5.4%) very frequently worried (**Table 2**).

Table 2. Smoking practices, habits and attitudes of the participants**Tabela 2.** Praksa, navike i stavovi ispitanika o pušenju cigareta

Did you have a chest X-ray in the last 12 months?/Da li ste u poslednjih 12 meseci imali rendgenski pregled pluća, N/Br. (%)	
Yes/Da	351 (14.3%)
No/Ne	2109 (85.7%)
How many chest X-rays did you have in the last 12 months? M±SD (range)	1.3±0.8 (1.0–8.0)
Koliko ste rendgenskih pregleda pluća imali u poslednjih 12 meseci? M±SD (raspon)	
Did you have a chest CT in the last 12 months?/Da li ste u poslednjih 12 meseci imali kompjutersku tomografiju pluća?	
Yes/Da	32 (1.3%)
No/Ne	2428 (98.7%)
How many times did you have chest CT in the last 12 months? M±SD (range)	1.2±0.8 (1.0–5.0)
Koliko puta ste u poslednjih 12 meseci imali kompjutersku tomografiju pluća? M±SD (raspon)	
Did you undergo mammography in the last 12 months?/Da li ste imali mamografiju u poslednjih 12 meseci? N/Br. (%)	
Yes/Da	138 (5.6%)
No/Ne	2,322 (94.4%)
How long have you been exposed to tobacco smoke for? years, M±SD (range)	21.8±12.4 (1.0–50.0)
Koliko dugo ste bili izloženi duvanskom dimu? godine, M±SD (raspon)	
Smoking status/Pušački status	N/Br. (%)
Smoker/Pušač	2048 (83.3%)
Ex-smoker/Bivši pušač	402 (16.3%)
Nonsmoker/Nepušač	10 (0.4%)
How many years have you been smoking/did you smoke daily? M±SD (range)	36.7±9.0 (1.0–65.0)
Koliko godina redovno (svakodnevno) pušite ili ste pušili? M±SD (raspon)	
How many cigarettes do/did you consume daily? M±SD (range)	22.0±7.9 (1.0–80.0)
Koliko ste u proseku pušili/pušite cigareta, M±SD (raspon)	
Pack-years (PY), M±SD (range)/Paklo – godina (PG), M±SD (raspon)	40.1±17.4 (1.0–174.0)
If you are an ex-smoker, how many years ago did you quit? M±SD (range)	7.6±7.0 (1.0–55.0)
Ako ne pušite, koliko godina ima od kada ste prestali da pušite? M±SD (raspon)	
Type of cigarettes you most often consume/consumed/Vrsta cigarete koje najčešće pušite/ste pušili?	N/Br. (%)
Commercial cigarettes/Cigarete - fabričke	1,986 (81.6%)
Hand-rolled cigarettes/Cigarete - Sopstvene izrade	428 (17.5%)
E-cigarettes/E-cigarete	19 (0.8%)
Pipe/Lula	2 (0.1%)
Have you considered quitting smoking in the past 6 months? (N=1977)	N/Br. (%)
Da li ste razmotrili mogućnost prestanka pušenja u prethodnih 6 meseci? (Br.=1977)	
Yes/Da	962 (48.7%)
No/Ne	1,015 (51.3%)
Do you plan to quit smoking in the next 30 days?/Da li planirate da prestanete pušiti u narednih 30 dana? N/Br.=1984)	
Yes/Da	477 (24.0%)
No/Ne	1,507 (76.0%)
Were you exposed to tobacco smoke as a child or teenager (<18 years)?	N/Br. (%)
Da li ste kao dete i tinejdžer (< 18 godina) bili izloženi duvanskom dimu?	
No/Ne	999 (40.6%)
Occasionally/Vrlo malo	311 (12.7%)
Moderately/Umereno	524 (21.3%)
Frequently/Često	626 (25.4%)
Were you exposed to tobacco smoke at home or workplace as an adult?	N/Br. (%)
Da li ste kao odrasli bili izloženi duvanskom dimu kod kuće/radnom mestu?	
No/Ne	396 (16.1%)
Occasionally/Vrlo malo	242 (9.9%)
Moderately/Umereno	653 (26.5%)
Frequently/Često	1,169 (47.5%)
How often do you worry about your lung cancer risk?	N/Br. (%)
Koliko često ste zabrinuti zbog sopstvenog rizika za nastanak karcinoma pluća?	
I am not worried/Nisam zabrinut/zabrinuta	651 (26.5%)
Rarely/Retko	362 (14.8%)
Occasionally/Ponekad	953 (38.7%)
Frequently/Često	360 (14.6%)
Very frequently/Vrlo često	134 (5.4%)

Legend: N – number of participants; M (mean) ±SD (standard deviation)

Legenda: Br. – broj ispitanika; M (srednja vrednost) ±SD (standardna devijacija)

Table 3. Practices, habits and attitudes of participants related to willingness to quit smoking**Tabela 3.** Praksa, navike i stavovi ispitanika u odnosu na spremnost da prestanu s pušenjem cigareta

	Willing to quit smoking <i>Planiranje prekida aktivnog pušačkog statusa</i>		p/p
	Yes/Da	No/Ne	
Did you have a chest X-ray in the last 12 months?/ <i>Da li ste u poslednjih 12 meseci imali rendgenski pregled grudnog koša?</i>	< 0.001		
Yes/Da	90 (18.9%)	181 (12%)	
No/Ne	387 (81.1%)	1,326 (88%)	
Total/ <i>Ukupno</i>	477	1,507	
Did you have a chest CT in the last 12 months? <i>Da li ste u poslednjih 12 meseci imali kompjutersku tomografiju grudnog koša?</i>	0.008		
Yes/Da	12 (2.5%)	14 (0.9%)	
No/Ne	465 (97.5%)	1,493 (99.1%)	
Type of cigarettes you most often consume/consumed?/ <i>Vrsta cigarete koje najčešće pušite ili ste pušili?</i>	0.001		
Commercial cigarettes/ <i>Cigarete – fabričke</i>	398 (83.6%)	1,163 (77.3%)	
Hand-rolled cigarettes/ <i>Cigarete – Sopstvene izrade</i>	70 (14.7%)	329 (21.9%)	
E-cigarettes/ <i>E-cigarete</i>	8 (1.7%)	10 (0.7%)	
Pipe/ <i>Lula</i>	0 (0%)	2 (0.1%)	
Total/ <i>Ukupno</i>	476	1,504	
How often do you worry about your risk of developing lung cancer? <i>Koliko često ste zabrinuti zbog sopstvenog rizika za nastanak raka pluća?</i>	< 0.001		
I am not worried/ <i>Nisam zabrinut/zabrinuta</i>	80 (16.8%)	430 (28.5%)	
Rarely/ <i>Retko</i>	55 (11.5%)	230 (15.3%)	
Occasionally/ <i>Povremeno</i>	183 (38.4%)	603 (40%)	
Frequently/ <i>Često</i>	113 (23.7%)	179 (11.9%)	
Very frequently/ <i>Vrlo često</i>	46 (9.6%)	65 (4.3%)	
Total/ <i>Ukupno</i>	477	1,507	

Legend: N – number of participants; p value – level of statistical significance/*Legenda: Br. – broj ispitanika; p – nivo statističke značajnosti***Table 4.** Correlation between smoking history and exposure to tobacco smoke**Tabela 4.** Povezanost dužine pušačkog staža sa izloženošću duvanskom dimu

	Smoking history (years) <i>Dužina pušačkog staža (godine) (M±SD)</i>	p/p
Were you exposed to tobacco smoke as a child or teenager (<18 years)? <i>Da li ste kao dete i tinejdžer (< 18 godina) bili izloženi duvanskom dimu?</i>	N (%) / Br. (%)	0.007
No/ <i>Ne</i>	36.0 ±9.0	
Occasionally/ <i>Povremeno</i>	36.9 ±8.2	
Moderately/ <i>Umereno</i>	36.6±9.2	
Frequently/ <i>Često</i>	37.6±9.2	
Were you exposed to tobacco smoke at home or workplace as an adult? <i>Da li ste kao odrasli bili izloženi duvanskom dimu kod kuće ili radnom mestu?</i>	N (%) / Br. (%)	< 0.001
No/ <i>Ne</i>	35.2±8.7	
Occasionally/ <i>Povremeno</i>	36.3±8.3	
Moderately/ <i>Umereno</i>	36.2±9.4	
Frequently/ <i>Često</i>	37.5±8.9	
Current employment status/ <i>Trenutni radni status</i>	N (%) / Br. (%)	< 0.001
Employed, zaposlen/ <i>Zaposlena</i>	33.5±7.1	
Unemployed, nezaposlen/ <i>Nezaposlena</i>	35.3±7.8	
Retired, penzioner/ <i>Penzionerka</i>	39.6±9.7	
Retired prematurely due to illness/ <i>Prevrneno penzionisan/penzionisana zbog bolesti</i>	36.0 ±12	

Legend: N – number of participants; M – mean; SD – standard deviation; p value – level of statistical significance
Legenda: Br. – broj ispitanika; M – srednja vrednost; SD – standardna devijacija; p – nivo statističke značajnosti

Table 3 presents an analysis of a subset consisting of 477 participants who reported intending to quit smoking within the next 30 days. Of these patients, 90 (18.9%) had undergone a chest X-ray in the previous 12 months, while 12 (2.5%) had a chest CT scan. Out of 476 participants who provided information about the type of cigarettes they smoked, 398 (83.6%) smoked commercial cigarettes, 70 (14.7%) smoke hand-rolled cigarettes, 8 (1.7%) used e-cigarettes and none reported smoking a pipe. All participants answered the question about their concern regarding the possibility of developing lung cancer with the following distribution: 80 (16.8%) never worried, 50 (11.5%) rarely worried, 183 (38.4%) occasionally worried, 113 (23.7%) frequently worried and 46 (9.6%) very frequently worried.

Among 1507 participants who reported not planning to quit smoking in the next 30 days, 181 (12%) had undergone a chest X-ray in the previous 12 months, while 14 (0.9%) had a chest CT scan. Out of 1504 who provided information about the type of cigarettes they smoked, 1163 (77.3%) smoked commercial cigarettes, 329 (21.9%) smoked hand-rolled cigarettes, 810 (0.7%) used e-cigarettes, and 2 (0.1%) smoked pipes. All participants answered the question about their concern regarding the possibility of developing lung cancer with 430 (28.5%) reporting never being worried, 230 (15.3%) rarely being worried, 603 (40%) occasionally being worried, 179 (11.9%) frequently being worried, and 65 (4.3%) very frequently being worried.

The results indicate that participants who were not exposed to tobacco smoke during childhood or as teenagers had the shortest duration of smoking in years (36.0 ± 9.0), while those frequently exposed had the longest duration (37.6 ± 9.2 , $p=0.007$). Similarly, participants who were frequently exposed as adults had the longest duration of smoking in years (37.5 ± 8.9), while those not exposed had the shortest (35.2 ± 8.7 , $p<0.001$). Employed participants had the shortest duration of cigarette consumption (33.5 ± 7.1), while retirees consumed cigarettes for the longest period of time (39.6 ± 9.7 , $p<0.001$) (**Table 4**).

Discussion

Although the risks of smoking to human health are well known, tobacco consumption remains the leading preventable cause of death and illness across all age groups, regardless of sex and geographic location [23]. However, it is noteworthy that the present study focused on adults aged 50 or above. Hence, it is valuable to compare our findings with those of a study conducted in 12 European states, which included a much broader age range [24]. The authors observed that educational differences between smokers and nonsmokers were more pronounced in the 20–44 age group, where less educated individuals were more likely to be smokers in most countries. In the 45–74 age group, directly comparable to our cohort, a correlation between active/former smoker status and lower educational attainment was noted in only a few countries [24]. Empirical evidence also

suggests that smokers living in a nonsmoking household are more likely to quit compared to those living alone or with a partner who smokes. Particularly, having a partner who is an ex-smoker increases the likelihood of quitting by 5-fold relative to being single [25]. These findings are expected, as cohabiting couples frequently share lifestyle habits. Therefore, healthcare professionals should involve partners of smokers in activities aimed at smoking cessation [23].

As our research was conducted as part of an LDCT screening pilot project, the study sample predominantly consisted of smokers (83.3%), who reported a smoking history. This sample composition aligns with prevailing international guidelines on LDCT screening, which target active or ex-smokers (those who stopped smoking within the last 15 years), with a smoking history of 25–30 PY and aged 50/55–75/80 years [26, 27]. The significance of such initiatives is highlighted by findings reported by Antonic D et al., indicating that in the Republic of Srpska, about 70% of newly diagnosed lung and trachea cancer cases and resulting deaths occurred in the 50–74 age group. The largest number of active smokers was noted in the 35–44 age group, with an average smoking history of about 20 years. Lung and trachea cancer were more common among men, who were also more likely than women to be active smokers [28]. Ex-smokers who participated in our study quit an average of 7.6 ± 7.0 years ago, while 48.7% of active smokers considered the possibility of quitting smoking in the last six months. Although most smokers recognize the highly harmful nature of tobacco consumption, their willingness to quit smoking is associated with their motivation to change bad habits and improve their health, as well as other factors [29]. Motivation to quit smoking and addiction to cigarettes are inter-related, and empirical evidence indicates that motivation to stop smoking can vary over time and is often influenced by the smoker's immediate environment [30]. Blondé J et al. found that the level of self-affirmation was positively related to higher motivation to quit among smokers in the high-dependency group but not among those exhibiting low-dependency traits [31]. However, identifying the factors that influence smoking cessation success rates is challenging due to considerable differences in results reported in the relevant literature. For example, Granda-Orive JI et al. surveyed 273 adults, of whom 147 or 53.8% were women, with an average age of 51 ± 11 years. They found that within 12 months, 53.5% of subjects (36.13% according to the intention-to-treat analysis) ($n=146$, 66 men and 80 women) quit smoking, with no statistically significant differences between sexes [32]. In another study involving 759 smokers, 32.4% reported not having smoked for at least 30 days at the 6-month follow-up. Additionally, 72.5% of participants attempted to quit smoking at least once, while 12.5% made at least three attempts. The authors observed that smoking cessation success was significantly predicted by older age at smoking initiation, non-

exposure to secondhand cigarette smoke, fewer quitting attempts, lower cigarette consumption, use of tobacco gum or patches, and lower carbon monoxide concentration at baseline [33]. With recent technological advances, smokers now have access to a wide range of mobile applications to support smoking cessation, particularly beneficial for those ambivalent about quitting and constantly delaying the decision [34, 35]. Further research is required to assess whether mobile applications can complement or replace traditional smoking cessation approaches [34].

Antuleska Belceska G et al. found a statistically significant association between professional exposure to tobacco smoke (16.2%) and positive family history of LC (20.8%) with lung cancer among their 173 study participants [36]. In our research, 14.6% and 5.4% of respondents respectively indicated that they are often and very often concerned about their lung cancer risk. Interestingly, those who had a chest X-ray or CT scan

in the preceding 12 months were more willing to quit smoking, which could also be interpreted as an increased concern for their health. In a study conducted in Poland involving 618 subjects (385 of whom were ex-smokers), 77% of respondents attempted to quit smoking on their own. They stated general concern for health (57%), personal health problems (32%), and social reasons (32%) as the primary motivators [37].

Conclusion

We have identified a low level of personal decisions to quit smoking, along with a concerning lack of awareness regarding the risks of developing lung cancer.

Physicians working in the primary healthcare settings should take a more proactive role in smoking cessation initiatives. Additional support at the primary healthcare level should be extended to individuals who have quit smoking, aimed to reinforce their decision by implementing preventive and corrective measures.

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