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ORIGINAL ARTICLE

Knowledge, attitudes and practices towards lung cancer among adults in KwaZulu-Natal, South Africa: a cross-sectional survey

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Abstract

Background. Lung cancer remains the number one cause of cancer mortality estimated at 1.8 million deaths. There are limited studies in resource poor countries regarding knowledge, attitudes and practices towards lung cancer.

Objective. This study aimed to describe the knowledge, attitudes and practices regarding lung cancer in selected communities in KwaZulu-Natal, South Africa.

Methods. An observational, analytic cross-sectional study design was conducted using a standardized questionnaire. A stratified random cluster sampling method was applied across five communities. A regression model was developed to identify the predictors of the level of knowledge.

Results. About 59.9% (95% CI 52.0 - 67.3) of the participants reported to have heard of lung cancer. The mean knowledge score was 41.8% (95% CI 35.7 - 47.9%). Coughing blood was the most recognized symptom (61.0%, 95% CI 52.1 - 69.1). About 17% (95% CI 14.7 - 21.5) of participants reported to be smokers. Many respondents reported that they would go to a health centre or clinic in case they were coughing blood (72.4%, 95% CI 93.9 - 79.5). Less than 10% (95% CI 3.9 - 8.1) of participants was screened for lung cancer at the time. Gender, history of working in the chemicals industry, screening for lung cancer, and time taken to seek health care when sick were significant predictors of lung cancer knowledge.

Conclusions. Public health interventions should be explored to increase the levels of community awareness regarding lung cancer, particularly focusing on the importance of screening, early diagnosis and treatment.

Keywords: Lung cancer, community awareness, screening, prevention.

INTRODUCTION

Cancer morbidity and mortality is increasingly becoming a major public health problem and it is the second leading cause of death worldwide[1]. Globally, over 20 million new cancer cases are projected for 2025 compared to about 17.5 million new cases in 2015[1–4]. Globally, new cancer cases estimates have been trending upwards between 2008 (12.7 million) and 2021 (19.3 million)[5–8]. About 19.3 million new cases of cancer were estimated globally in 2020, with lung cancer being the second most commonly diagnosed cancer (2.2 million, 11.4%) after female breast cancer (2.3 million, 11.7%)[8]. Lung cancer remained the number one cause of cancer mortality estimated at 1.8 million deaths (18%). In South Africa, lung cancer is among the top four ranking cancers in terms of morbidity and mortality after breast, prostate, and cervical cancers[1]. However, the trends of lung cancer mortality in Africa are based on scanty epidemiological evidence[9], and the burden of disease is underestimated[6].

Greater lung cancer awareness, symptom recognition, early diagnosis, and access to appropriate treatment may improve outcomes.[9–11] Lung cancer prevention is best.[9] A Malaysian study found that smokers and nonsmokers were willing to go for lung cancer screening if they knew their risk.[11] In contrast, 92.8% of USA veterans were willing to screen for lung cancer regardless of smoking.[12,13] A study on smoking cessation among USA veterans found that most saw lung cancer screening as stimulating and self-reflective.[14]They also liked lung cancer screening. During screening, some were anxious.

Low- and middle-income countries (LMICs) have done few studies on lung cancer knowledge, attitudes, and practices (KAPs). Morhason-Bello et al. and Williams et al. propose cancer awareness, advocacy, research, workforce care training, and funding to avert this situation.[15,16]Cancer care is poor in SSA, including South Africa.[17]Better awareness and detection are needed.

The purpose of this observational cross-sectional study was to describe the knowledge, attitudes and practices regarding lung cancer in selected communities in KwaZulu-Natal, South Africa.

MATERIALS AND METHODS

Study setting and design

This study was conducted in selected communities (townships: Umlazi, Chatsworth, Lamontville, Imbali and Sobantu), and suburb: Bluff) in KwaZulu-Natal (KZN), South Africa. A township is an area where the previously disadvantaged communities (predominantly Black African people) were forced to live in during the apartheid era in South Africa[18]. Households were visited between March and May 2019. An observational, analytic cross-sectional study design was conducted using a standardized questionnaire. The questionnaire was piloted in each of the five study communities. Ten participants were recruited in the pilot study. These participants were not included in the study sample, and they were not from the study sites.

Study population, inclusion, and exclusion criteria

Adults from the legal age of 18 years and above residing in the one of the selected communities were targeted to participate in this study. Both genders were invited to participate in the study. People younger than 18 years were excluded from participation.

Sample size and sampling method

A stratified random cluster sampling method was applied, with clusters randomly stratified across five representative communities. A total of 40 out of 879 clusters were selected using probability proportional to population size (PPS) sampling. Twenty households were selected from each cluster based on maps of the selected communities. A minimum of

Supplementary information The online version of this article (Tables/Figures) contains supplementary material, which is available to authorized users.

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20 participants were randomly sampled within each cluster to allow a precision of ± 5% assuming a design effect of two (2) with 95% confidence and assuming maximum variability (i.e. p=0.5 or 50%). A total sample size of 800 was estimated.

Data collection tool

A standardised questionnaire was used in this study as a measurement instrument that consisted of different sessions including participants' socio-demographic data, knowledge, attitudes and practices (and health-seeking behaviour) regarding lung cancer. The socio-demographic variables were from the National Income Dynamics Study, Wave 3 questionnaire[19], and the variables about lung cancer were taken the Cancer Research UK. Lung Cancer Awareness Measure Toolkit. Version 2.1. 2011[20]. The variables that were collected were: Gender, Age, Race/ethnicity, Socioeconomic status, Type of settlement, Level of education, Smoking behaviour, Knowledge (e.g., sign and symptoms, risk factors, and treatment of lung cancer), Attitudes (what to do if coughing blood, persistently, or suspecting lung cancer), and Health-seeking behaviour towards lung cancer. The questionnaire was in English and translated into isiZulu for the participants to choose their preferred language. A team of field workers administered the questionnaires. The data was captured using REDCap[21] which is connected to a server that has redundancy protocols, only accessible to users with granted access through login credentials.

Data analysis

The data was analyzed using STATA 15 and summarized and presented using tables. Cronbach's Alpha was calculated for the knowledge (0.94) and attitude (0.08) domains of the questionnaire to test for internal consistency. The knowledge score was calculated by summing all the knowledge variables, dividing the outcome by the number of the variables (34), and then multiplying them by hundred to get the percentage. Each correct response was assigned a value of one (1) and zero (0) for an incorrect one. The participants' knowledge scores were grouped either as poor knowledge (<50%) or good knowledge (≥50%). The two groups were then compared in terms of the socio-demographic factors. Because of the sampling design, it was possible to have sample weighted 95% Confidence Intervals (CI) around the point estimate. A regression model was developed to identify the predictors of the level of knowledge.

Ethics approval and consent to participate

The study was granted ethics approval from the University of KwaZulu-Natal Biomedical Research Ethics Committee (BREC). The study approval number is BF585/18. The participants gave a written informed consent after the field workers explained the study aim, objectives and methods to potential participants before participating in the study. The participants' confidentiality was protected through administering the questionnaires in an environment comfortable and in the privacy of the participants' homes. The completed questionnaires were kept under lock and key, and the captured data in a password protected computer.

RESULTS

Description of the sample

A total of 793 respondents participated in this study. About 12.8% refused to participate in the study. The majority (51.5%, 95% CI 47.8 - 55.2) of the participants were males (Table 1). The participants' mean age (± standard deviation [SD]) was 52.5 (SD±14.8) years. Most of the participants were Africans (70.3%, 95% CI 53.9 - 82.7), followed by Asians/Indians (20.6%, 95% CI 10.8 - 35.6) and Coloureds (mixed race) (7.8%, 95% CI 3.0 - 18.6). Many participants (67.4%, 95% CI 51.4 - 80.2) reported isiZulu as their preferred language, followed by English (30.8%, 95% CI 18.1 - 47.4). Fewer participants (44.5%, 95% CI 38.5 – 50.6) reported reaching grade 12 level of education. Less participants (18.9%, 95% CI 14.1 - 24.7) reported reaching tertiary education. About 30.4% (95% CI 24.7 - 36.9) reported a monthly household income of $100 (where USD 1=ZAR15). Less than three percent reported an income of $1800 or more. Just over 17% (95% CI 14.7 - 21.5) of participants were smokers, with the average number of cigarettes smoked per day of seven (7) and the average packs of 5.5 per week.

Most participants (78.2%; 95% CI 70.2 - 84.6) did not paying for health services. The average paid per health visit was $17 (95% CI $8.57 - $25.75). Less participants 12% (95% C I8.7 - 16.3) had worked in a chemicals industry. An average of seven years was reported by those that had worked in the industry (95% CI 4.9 - 8.5). A lower proportion (1.9%; 95% CI 1.2 - 3.0) had worked in the mines, with an average of 4.5 years (95% CI 0.5 - 8.5) working there.

Knowledge of lung cancer

Of the sample, about 59.9% (95% CI 52.0 - 67.3) of the participants reported having heard of lung cancer (Table 2). Fewer participants (34.8%, 95% CI 28.9 - 41.2) had heard of lung cancer through radio, followed by television (28%, 95% CI 22.2 - 33.6), newspaper (~25%, 95% CI 18.8 - 32.2) and health professional (~16%, 95% CI 11.9 - 21.3). Coughing blood was the most recognised lung cancer symptom (61.0%, 95% CI 52.1 - 69.1), followed by Persistent chest pain (50.1%, 95% CI 41.2 - 59.0), persistent shortness of breath (49.1%, 95% CI 39.5 - 58.7), and a cough that does not go away for two to three weeks (40.8%, 95% CI 32.3 - 49.9). The mean knowledge score was 41.8% (95% CI 35.7 - 47.9%).

Smoking was the most recognised risk factor (81.2%, 95% CI 72.2 - 87.4), followed by exposure to harmful mineral dust in the mines (56.2%, 95% CI 45.4 - 66.4), and inhaling harmful chemicals (54.6%, 95% CI 44.9 - 64.0). Less participants (10%, 95% CI 6.8 - 12.0) knew someone that was diagnosed with lung cancer. Chemotherapy was cited by most participants (52.2%, 95% CI 42.6 - 61.7) as a treatment option for lung cancer, followed quitting smoking (40%, 95% CI 31.3 - 49.7).

Most participants (77.4%, 95% CI 69.4 - 83.9) agreed that avoiding smoking reduces the risk of lung cancer. This was followed by avoiding second-hand smoke (56.6%, 95% CI 47.6 - 65.1), using protective equipment when working in the mines or chemicals industry (52.8%, 95% CI 43.0 - 62.3), exercising (30.8%, 95% CI 23.2 - 39.6), and lastly eating fruit and vegetables and reducing sugar and starch (30.5%, 95% CI 23.1 - 39.1). Less participants (18.7%, 95% CI 14.2 - 24.3) had heard about lung cancer screening. Fewer participants (48.9%, 95% CI 41.0 - 56.8) knew that lung cancer can be detected early.

Attitudes towards lung cancer prevention

Many participants (72.4%, 95% CI 93.9 - 79.5) reported that they would go to a health centre or clinic in case they were coughing blood. Fewer (24.9%, 95% CI 17.9 - 33.6) said that they would consult a medical doctor (private GP). Just over a percent said they would not do anything in that situation (1.5%, 95% CI 0.9 - 2.5). Similarly, more participants (75.4%, 95% CI 67.2 - 82.1) said they would go to the health centre of clinic, if they were coughing persistently. Many participants (71.0%, 95% CI 62.5 - 78.3) reported that they would take between one and three days to consult a medical doctor, if they thought they has symptoms of lung cancer. Most participants (71.4%, 95% CI 63.2 - 78.4) would not consult a traditional, if they thought they had symptoms of lungs cancer. Most participants (93.7%, 95% CI 89.7 - 96.2) expressed willingness to screen for lung cancer. Most participants (97.7%, 95% CI 95.4 - 98.2) wanted a national screening program in the future, however, they were unwilling to pay for service (64.7%, 95% CI 57.4 - 71.3) (Table 3).

Health-seeking behaviour

Less participants (10%, 95% CI 3.9-8.1) were lung cancer-screened. More participants (57.6%, 95% CI 49 - 65.8) said fever prompted them to seek medical care, followed by diarrhoea (17%, 95% CI 11.3 - 24.7) and cough/pneumonia (11.3%, 95% CI 7.6 - 16.5) Fewer respondents (42.1%) said they waited two to three days after getting sick to seek care. They were followed by those who reported within 24 hours (42%) and more than three days (13.6%). Many participants (76.9%, 95% CI 69.8-82.7) agreed that distance did not affect their attendance at the health facility. Transport to the hospital averaged $2.50 (95% CI $1.60-3.11) per trip. More participants (59.6%, 95% CI 51.6 - 67.1) didn't get the health services they needed (Table 4).

Community knowledge predictors

Sample knowledge ranged from 4.1% to 97.1%. In the lung cancer knowledge predictive model, only statistically significant variables were included. Unadjusted and adjusted odds ratios are presented (Table 5). Gender, chemical industry experience, lung

cancer screening, and time to seek care when sick predict lung cancer knowledge. Although gender wasn't a statistically significant predictor of lung cancer knowledge in the unadjusted model, it was included for its importance. Females were 1.86 times more likely to have good lung cancer knowledge in the adjusted model (p=0.016). Imbali residents were 0.093 times less likely to have good lung cancer knowledge (p=0.040). The adjusted model lost significance (aOR 0.401, 95% CI 0.026-6.132, p=0.512).

Working in the chemicals industry predicted good lung cancer knowledge (uOR 2.328, 95% CI 1.259-4.305) (p=0.007), and this was maintained in the adjusted model (aOR 2.361, 95% CI 1.142-4.884) (p=0.021). Screened participants were 5.455 times (95% CI 2.149-13.847) more likely to have good lung cancer knowledge (p0.001), and this was maintained in the adjusted model (aOR 4.887, 95% CI 1.684-14.188, p=0.004). Participants who sought care within two to three days of being sick were less likely to know about lung cancer. The adjusted model maintained this effect (aOR 0.411, 95% CI 0.238-0.711, p=0.001).

Age, race, preferred language at home, level of education, smoking cigarettes, household income, paying for health services, history of mine work, knowing someone with lung cancer, participants' behavior when coughing blood, and participants' behavior when coughing persistently were also included in the univariate model but were not significant. The adjusted model omitted these variables.

DISCUSSION

Studies investigating lung cancer awareness in LMICs are limited. The current study contributes to a greater understanding of lung cancer knowledge and awareness in such contexts. Such understanding could contribute to how countries in these contexts respond with prevention strategies, early diagnosis treatment and care.

Knowledge of lung cancer

The sample knowledge mean score was 41.8% (95% CI 35.7% - 47.9%) in the current study. A study conducted among students at a tertiary institution in Malaysia found that over 50% of those students had good knowledge regarding lung cancer.[22] In the current study, coughing blood was the most recognised warning sign at 60.9%, followed by persistent chest pain (50.1%) and persistent shortness of breath (49.1%). Conversely, a Malaysian study found that a worsening of, or a change in an existing cough was the most recognised (88.8%) warning sign of lung cancer.[11] This sign was followed by a persistent chest infection (85.9%), and coughing up blood (85.3%). In an Indian study of college teachers, the persistent cough was the most recognised warning sign (67.5%) of lung cancer.[23] The second and third most recognised signs were shortness of breath (56.5%) and sputum streaked with blood (haemoptysis) (42.8%), respectively. A study among secondary school male teachers in Malaysia, chest pain (87.3%), coughing up blood (86.0%) and shortness of breath (84.7%) were the three most recognised signs of lung cancer.[24] More participants in the Malaysian studies were able to recognise the top three warning signs of lung cancer in relation to their study samples compared to the current study.

A few studies reported on the knowledge of risk factors associated with lung cancer. In the current study, over 81% of the sample agreed that smoking increased lung cancer risk. Similarly, cigarette smoking was acknowledged as a risk factor of lung cancer by a few studies.[11,23–25] In this study, fewer participants (49.2%) recognised second-hand smoking as a risk factor. Similarly, quitting smoking, as part of the mitigating factors for lung cancer, was acknowledged by fewer participants. A similar trend was observed in an Australian study that investigated the knowledge of signs and symptoms and risk factors associated with lung cancer among individuals 40 years and above.[26]The study found that although most participants (90.6%) could recognise smoking as a risk factor, less (25.6%) could also recognise second-hand smoking as a risk factor.

In the current study, history of working in the mines, screening for lung cancer, and time taken to seek health care when sick were predictors of lung cancer knowledge. Most studies on this topic in recent years have focused on the level of knowledge of lung

cancer. Not enough attention has been given to the predictors of lung cancer knowledge.

Smoking behaviour

In this study, the proportion of smokers seemed to be low (17.8%). This result should be interpreted with caution as this is a self-reported measure[27]. Possible assumption could be that some participants may have not reported their smoking status correctly for fear of stigma and/or discrimination. A United Kingdom (UK) study explored the perceptions and experiences of lung cancer patients regarding stigma, where the patients felt stigmatised as the disease was associated with smoking[28]. Nonetheless, an American Cancer Society report on tobacco use in Africa reported an upward trend in tobacco use from 1990 to 2010[29]. However, the reported trend for South Africa seemed to be the opposite in the same period. A study by van Welbeek also reported a similar trend from year 1993 to 2000, where the smoking prevalence dropped by 16.9% in that same period. However, there seemed to be an increase in smoking in the 15+ years segment of the population during this period.

Health-seeking behaviour

Most of the participants reported to have never screened for lung cancer, even though they were open to the idea of screening. Most of them were for the idea of the authorities providing the services, but fewer were willing to pay for the service. This may explain the low uptake of the screening low uptake of the service among the participants. A London study among smokers, former smokers and never smokers from a lower socioeconomic background found that former (14.5%) and never smokers (13%) believed that there was no point in screening for lung cancer if a person was still smoking[30]. A study done in England found that patients tended to delay going for consultation, despite having symptoms, such as, coughing, breathing changes and pain in the chest[31]. A study conducted in the UK found that about 48% of participants waited more than two (2) weeks to seek medical advice, when they experienced persistent cough[32]. A qualitative study in England among 41 to 88 year olds found that participants delayed seeking medical help, because they thought that a symptom they were experiencing was due to either ageing or smoking and could be self-managed[33]. In some cases, having a lung comorbidity such as Chronic Obstructive Pulmonary Disease (COPD) complicated the situation. The prompt to go seek medical help was the worsening of the symptoms.

The key strength of the current study was that primary data were used to ascertain the study outcomes. This study is the first of its kind in the context of South Africa to the best knowledge of the authors and is added to the body of knowledge on the subject. Limitation of the study is that the study cannot be generalized beyond the study's target population, because of the limited sampling frame. However, it may have implications for populations with similar group characteristics. The participants' responses may be biased because of social desirability bias, particularly when answering questions regarding smoking.

CONCLUSIONS

Public health interventions should be explored to increase the levels of community awareness regarding lung cancer, particularly focusing on the importance of screening, early diagnosis and treatment. Interventions to sensitise health personnel (including doctors and nurses) with a view to increase the level of alertness regarding lung cancer as a public health concern (suspicion index) should be investigated, as this could contribute towards early detection and diagnosis. Health policy on lung cancer prevention, screening and early detection should be strengthened to address the issues raised in this study. Very few individuals reported to have screened for lung cancer before. Nonetheless, there was a general willingness to screen for lung cancer, provided the service fee was not for their account. Public health policy makers need to develop policy on screening and early detection, as this could play a critical role in the early diagnosis of lung cancer patients (i.e., diagnosis at stage I/II) when treatment is more likely to be effective.

INFORMATION

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