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Factors Influencing Occupational Health Practices and Hypertension Among Security Personnel in a Public University

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ABSTRACT

Introduction: The noncommunicable disease has emerged as a major epidemic for decades and hypertension has been reported as a disease that has a high association with the occupational factors of security personnel. The duty routines of security personnel such as doing patrols, post-guards and the need to stay alert have made them vulnerable to occupational health and safety hazards. Therefore, this study aimed to identify the factors influencing occupational health practices and hypertension among security personnel in a public university in Kota Kinabalu, Sabah. **Methodology:** A cross-sectional study was conducted among the security personnel of a public university in Kota Kinabalu, Sabah, using a convenient sampling technique. Questionnaires adapted from NHMS 2019 have been distributed among the security personnel of the selected public university. Data analysis was conducted by using the SPSS version 28. Descriptive analysis and cross-tabulations were conducted. Pearson Chi-square/Fisher exact test was used to find the association. Statistical significance was considered at $p<.05$. **Results:** Of the total respondents, 77.7% were male and 22.3% of them were female. The mean age of the respondents was 35.5 years with a standard deviation of 8.5. The proportion of annual cardiovascular screenings was 68%, and type of residence (p=.013) and previous employment factors (p=.013) were found

to be statistically significant. Alternately, the proportion of recent cancer screenings was 16.5%, and gender (p=<.001), marital status (p=.004) and year of services (p=.034) were found to be statistically significant. The prevalence of hypertension was 21.4%, and age (p=.001) and year of services (p=.010), were found to be statistically significant. **Conclusion:** Early detection of underlying disease will contribute to the prevention of cardiovascular diseases such as hypertension and diabetes mellitus. Subsequently, annual health screening activities are essential in guaranteeing the quality of health and a life sustenance fundamental practice among security personnel.

INTRODUCTION

The noncommunicable diseases (NCDs) had exerted a heightening trend of morbidity and major cause of mortality across the globe and Malaysia to date (National Institute of Health, 2020; World Health Organization, 2013; World Health Organization, 2023). In particular, the cardiovascular diseases (CVDs), such as hypertension and diabetes mellitus had topped rank other NCDs (Budreviciute et. al, 2020; National Institute of Health, 2020; World Health Organization, 2013; World Health Organization, 2023).

The good and bad effects of urban living were better job prospects but unhealthy lifestyles. The unhealthy lifestyle had further subjected the population living the urban lives to the development of NCDs. In addition, demographic aging, gradual and rapid urbanization and globalization of unhealthy lifestyles have led to a shift in the trends of epidemiologic transcended humankinds, in particular, the NCD (Kumar et. al, 2023; Budreviciute et. al, 2020; National Institute of Health, 2020; World Health Organization, 2023).

Factors associated with occupational health (OH) practices were indicated by measures taken to maintain a good health status. In order to maintain good health, the security personnel should be aware of their health status in the first place. As described by Chauhan et. al, 2022, focus on law enforces health status and timely intervention rather important in order to maintain good health.

Various studies have shown the association of occupational factors of police duty natures with the prevalence of hypertension (Arredondo, 2019; Parkash et. al, 2019; Hussain & Ajuwon, 2020; Chauhan et. al, 2022; Kumar et. al, 2023). There was also an association of sociodemographic factors with the incidences of hypertension among police types of occupations (Kumar et. al, 2023; Hussain & Ajuwon, 2020). The findings mentioned above had shown inconsistencies in the prevalence of hypertension in various abroad regions as indicated in their studies, in which in the Indian regions, hypertension among policemen indicated higher prevalence (Parkash et. al, 2019; Chauhan et. al, 2022; Kumar et. al, 2023), when compared to the study conducted among policemen in Mexico (Arredondo, 2019).

The above-mentioned phenomenon raised interest in the current study setting and population, in which the sociodemographic and occupational factors of the study population would have predisposed them to the infliction of hypertension. This led to insights that present ranked position, job scopes, duty shifts, working hours, year of service and previous employment were the occupational factors that had contribute to the development of hypertension among security personnel of the study population.

Whereas, the significant influences of occupational factors on humankind were that occupants in various broad cultures of occupation tended to be developing or inculcating various modes of dietary patterns, socializing norms and within-society

adaptation (Parkash et. al, 2019). This led to the insights that non-modifiable risk factors such as the gender, age, race, marital status, level of education and type of residence would have caused the infliction of hypertension among the security personnel of this study setting.

Hypertension had been identified to be highly associated with security nature of occupations (Chauhan et. al, 2022; Hussain & Ajuwon, 2020; Parkash et. al, 2019). The need to stay alert and highly vigilante had imposed them to the infliction of hypertension (Chauhan et. al, 2022; Hussain & Ajuwon, 2020; Parkash et. al, 2019). This correlated with the duty scopes of security personnel which demanded them to be in highly vigilante mode and concentrations while doing post-guards in their designated post locations.

In this particular study, the main study population and settings involved a public university security division, which was registered as auxiliary police of the University but profoundly known as security personnel. The classification of their duty roles would resemble the duty forces of both the security and police forces. Nevertheless, this study aimed to investigate factors associated with occupational health practices and hypertension among the security personnel in Kota Kinabalu, Sabah.

MATERIALS AND METHODS

Study Design, Setting and Participants

A cross-sectional study was conducted from September 2022 to July 2023 among the security personnel of a public university security division, in Kota Kinabalu, Sabah. All eligible study participants who consented to participate in this research activity received a hard copy of an anonymous questionnaire. This included an explanatory opening paragraph reporting the purpose of the study, advising that there was no obligation to complete the questionnaire, and reassuring that the information obtained would remain confidential. The return of the ended question was considered as written consent to participation. Pre-tested questionnaires adapted from NHMS 2019 were self-administered in the security division office setting and in every zone post location in the university compound. It contained three sections which were: I socio-demographic factors, and occupational factors and II the self-reported medical histories of known hypertension. The final section assessed their practice of substantial OH elements which consisted of the annual cardiovascular and recent cancer screenings.

Dependent Variables

Annual cardiovascular/medical check-ups/ screenings were the thorough body check-ups conducted and medical reports that had been validated by medical doctors and could be used as proof of the designated worker's health condition (National Institute of Health, 2020). Whereas, cancer screenings were the pre-cancer screenings conducted based on the most recent period within this study implementation. Collectively, colorectal, breast, PAP smear and mammogram were jointly grouped in this variable (National Institute of Health, 2020). Meanwhile, the known hypertension was defined as self-reported as being told to have hypertension by a doctor or assistant medical officer, in the past twelve months of this study duration (National Institute of Health, 2020).

Independent Variables

The socio-demographic variables were gender, age, marital status, type of residence and level of education. Residence is defined as security personnel who temporarily resided within the university compound due to duty purposes and non-residence are those living outside the university compound and needed to travel back and forth for duty purposes.

The occupational variables were present ranked position, job scopes, working hours, duty shifts, year of service and previous

employment factors. Junior ranked position referred to every ranking order below ranking grades 41, and senior referred to ranking grades 41 and above. The administration duty scopes comprised desk job, administrative, and accounting type duties and attached in the security division main office and worked in Non-shift mode of working (daily office hours). Meanwhile, operational duty scope entitled to doing regular patrols, zone post guards and supervising and working in shift mode. Previously unemployed/self-working referred to as security personnel who were not affiliated in other working sectors. Whilst, the previously employed security personnel were those affiliated in another working sector before joining the security division of Universiti Malaysia Sabah (UMS).

Sample Size Calculation and Sampling Technique

A convenient sampling technique was used to select study units and the sample size was calculated using the Krejcie & Morgan (1970) sample size formulae (Chua, 2020). Thus, with a population of 170, the sample size was determined as 118.

Inclusion Criteria

Serving security personnel aged between 20 and 60 years old and were willing to participate were included in the study.

Exclusion Criteria

The security personnel of the university setting who were on sick and personal leaves were excluded from the study.

Data Analysis

Data were compiled and analyzed using SPSS version 28.0. Descriptive analysis and Crosstabs were used to evaluate association between groups of the categorized variables. p-value <.05 was considered statistically significant. Whereas Pearson Chi Square and Fisher Exact test were used to determine the significant association between independent and dependent variables.

Ethical Approval

The ethics approval for research activities had been given by the medical committee of the Faculty of Medicine and Health Sciences, UMS. The approval code was JKEtika 1/23 (13). In addition, research activity consent was also submitted and approved by the university setting security division.

RESULTS

A total of 103 respondents were obtained throughout the study. Of the 103 respondents, 68 (66%) of them were identified to have conducted yearly cardiovascular health screenings and 17 (16.5%) of them have conducted cancer screenings. Male security personnel, between 31 and 40 years of age, Sabahan, married and with secondary level of education, junior ranked, having operational duty scope, having 1 to 5 years of services and previously employed in other working sectors made up the majority of respondents to have conducted annual cardiovascular and cancer screenings. Whereas, type of residences (p=.013) and previous employment factors (p=.013) were identified to have significant association with the prevalence of yearly conducted cardiovascular screenings. Besides, gender (p=<.001), marital status (p=.004) and year of services (p=.034) were identified to have significant association with the prevalence of cancer screenings. All information was shown in Table 1.

On the other hand, 22 (21.4%) of them were identified to have known hypertensive. The age factor (p=0.002) and year of services were identified to have significant association with the prevalence of known hypertension (p=.010). Meanwhile, sociodemographic factors such as race, marital status, education and type of residences and occupational factors such as the present rank position, duty scopes, shift hours and previous employment factors had no significant association with the prevalence of known hypertension. All information was shown in Table 2.

Table 1. The Association of socio-demographic and occupational factors with the prevalence of annual cardiovascular and cancer screenings.

Variable (n=103)	Annual Cardiovascular Check-ups n (%)	p-value	Cancer Screenings n (%)	p-value
	68 (66)		17 (16.5)	
Gender Male Female	 51 (49.5) 17 (16.5)	Fisher's exact test used: .259	 2 (11.8) 15 (88.2)	Fisher's exact test used: <.001
Age (Years) 20 to 30 31 to 40 41 and above	 23 (33.8) 30 (44.1) 15 (22.1)	χ2 value=.060; df=2; p=.970	 6 (35.3) 7 (41.2) 4 (23.5)	χ2 value=.101; df=2; p=.951
Race Malay Sabahan Sarawakian	 3 (2.9) 63 (61.2) 2 (1.9)	χ2 value=2.705; df=2; p=.259	 1 (5.9) 16 (94.1) -	χ2 value=1.104; df=2; p=.602
Marital Status Unmarried Married Divorce/Widow/Widower	 16 (15.5) 51 (49.5) 1 (1)	χ2 value=3.323; df=2; p=.190	 5 (29.4) 9 (53) 3 (17.6)	χ2 value=11.166; df=2; p=.004
Level of Education Secondary Level Tertiary Level Higher Level	 47 (45.6) 13 (12.6) 8 (7.8)	χ2 value=.380; df=2; p=.827	 11 (64.7) 5 (29.4) 1 (5.9)	χ2 value=1.305; df=2; p=.521
Type of Residences Residence Non-Residence	 9 (8.7) 59 (57.3)	Fisher's exact test used: .013	 1 (5.9) 16 (94.1)	Fisher's exact test used: .281
Present Ranked Position Junior Senior	 61 (59.2) 7 (6.8)	Fisher's exact test used: .541	 17 (100) -	Fisher's exact test used: .150
Job Scope Administration Operation	 17 (16.5) 51 (49.5)	Fisher's exact test used: .259	 1 (5.9) 16 (94.1)	Fisher's exact test used: .063
Duty Shift Yes No	 60 (88.2) 8 (11.8)	Fisher's exact test used: .448	 16 (94.1) 1 (1)	Fisher's exact test used: .424
Year of Services New Intake 1 to 5 Years 6 to 10 Years 11 Years and above	 11 (10.7) 22 (21.4) 18 (17.5) 17 (16.5)	χ2 value=6.661; df=3; p=.084	 1 (5.9) 11 (64.7) 1 (5.9) 4 (23.5)	χ2 value=8.657; df=3; p=.034
Previous Employment Factors Unemployed/ Self-Working Employed	 15 (22.1) 53 (77.9)	Fisher's exact test used: .013	 7 (41.2) 10 (58.8)	Fisher's exact test used: .209

Table 2. The association of socio-demographic and occupational factors with the prevalence of known hypertension.

Variable (n=103)	Known Hypertension n (%)	p-value
	22 (21.4)	
Gender Male Female	 18 (22.5) 4 (3.8)	Fisher's exact test used: .418

Age (Years) 20 to 30 31 to 40 41 and above	 1 (4.5) 11 (50) 10 (45.5)	 χ2 value=13.744; df=2; p=.001
Race Malay Sabahan Sarawakian	 1 (1) 21 (20.4) -	 χ2 value=.800; df=2; p=.670
Marital Status Unmarried Married Divorce/Widow/Widower	 3 (2.9) 19 (18.4) -	 χ2 value=3.211; df=2; p=.201
Level of Education Secondary Level Tertiary Level Higher Level	 15 (14.6) 5 (4.9) 2 (1.9)	 χ2 value=.143; df=2; p=.931
Type of Residences Residence Non-Residence	 4 (3.8) 18 (17.5)	 Fisher's exact test used: .345
Present Ranked Position Junior Senior	 20 (19.4) 2 (1.9)	 Fisher's exact test used: .638
Job Scope Administration Operation	 7 (6.8) 15 (14.6)	 Fisher's exact test used: .178
Duty Shift Yes No	 21 (20.4) 1 (1)	 Fisher's exact test used: .268
Year of Services New Intake 1 to 5 Years 6 to 10 Years 11 Years and above	 - 6 (5.8) 5 (4.9) 11 (10.7)	 χ2 value=11.409; df=3; p=.010
Previous Employment Factors Unemployed/ Self-Working Employed	 9 (8.7) 13 (59.1)	 Fisher's exact test used: .162

DISCUSSION

The OH practices would symbolize the importance of maintaining appropriate health practices while at work, for employees' long-term well-being (World Health Organization, 2002). The occupational health hazards could be broadly classified as biological, chemical, physical, ergonomic, and psychological agents, and accidents (Mehrdad, 2020; Canadian Centre for Occupational Health and Safety, 2021). In relation to this, factors associated with OH included mitigation and identification of health risks and hazards, improved efficiency and productivity, improved employee relations and morale, reduced costs associated with accidents or injuries which resulted from fewer workplace incidents and workers' compensation claims (World Health Organization, 2002).

Since the 9th Malaysia Plan in 2006, the focus has changed from illness to wellness and many policies and programs have been introduced and implemented to encourage regular health screenings (National Institute of Health, 2020). The notable recent one is the PEKA B40 health screening initiative for the low-income B40 group aged 40 years and above which had been related to cardiovascular (CVD) screenings.

The annual cardiovascular screenings comprised of blood pressure, full blood count, lipid profile and glycated hemoglobin test. This was the basic package in the yearly medical

check-ups conducted as for health and also occupational demands for contract renewal purposes.

In Malaysian settings, the prevalence of health screening or medical check-ups within the past 12 months (prior to the period of this survey conducted through NHMS 2019) was 49.0% (95% CI: 47.03, 50.94). The prevalence was higher among older age groups, with 77.3% (95% CI: 74.36, 79.95) among adults aged 60 years and above. Females also reported having a higher prevalence compared to males. Widowers and divorcees had a higher uptake of medical check-ups, as well as among retirees.

Among the socio-demographic factors assessed in this study, type of residence showed a significant association with the prevalence of yearly medical screenings. Non-residence turned out showing higher prevalence and was highly significant in having conducted the yearly medical screenings as compared with residents. Whereas in terms of occupational factors, previous employment factor was shown to be significantly associated with a high prevalence of yearly conducted medical screenings, in which previously employed in other working sectors were highly prevalent in comparison with those previously unemployed or self-worked.

Other than CVD risk screenings, Malaysia also has a national cancer screening program for breast cancer, cervical cancer, and colorectal cancer (National Institute of Health, 2020). Such notions should be highly encouraged, but the actual uptake of health screening practices among Malaysians is still vastly unknown (National Institute of Health, 2020).

As reported in NHMS 2019, breast cancer was the most common cancer among women in Malaysia. Breast self-examination, clinical breast examination, and mammogram screening were several methods suggested for early detection of breast lumps. Mammogram screening did exhibit a reduction of breast cancer mortality by approximately 15% for women aged 39 to 49 years old. As reviewed in NHMS 2019, the most significant barriers to mammograms among Malaysian women in the general population were lack of time, lack of knowledge, unawareness of the facilities to run the test, and the fear of knowing the test result.

On the other hand, cervical cancer is the most common cancer among women worldwide. As per the report, in Malaysia, cervical cancer was the third most common cancer in women, with an incidence rate of 6.3 per 100,000 (National Institute of Health, 2020). The pap smear screening program was introduced in Malaysia by the MOH in 1969. Moreover, women aged between 30 and 65 years and who were sexually active were recommended to undergo pap smear screening.

In addition, colorectal cancer (CRC) was the most prevalent cancer among males (14.8%) and second most common among females (11.1%), according to the Malaysia Cancer Registry Report 2012 to 2016. Evidence exists that reductions in CRC mortality could be achieved through the detection and treatment of early-stage CRCs. In Malaysia, the CRC screening program was implemented using the WHO stepwise approach in 2014. The target group was asymptomatic males and females aged 50 to 75 years old. The screening method was using the immunological Faecal Occult Blood Test (iFOBT), followed by colonoscopy for those who were found to be positive for iFOBT. The objective of the colorectal screening program in Malaysia was to detect the pre-cancerous lesion and to detect cancer at the earliest stage possible (National Institute of Health, 2020).

It showed that the female gender and married status had significant association with the prevalence of the yearly conducted cancer

screenings. These findings show inter relation as the fact that the type of cancer screenings being assessed, such as breast cancer, PAP smear test and mammogram were gender preference over female and that requirements of doing were mainly associated with the marital status of females, for instance, the PAP smear test.

The occupational factors revealed that the year of services had a significant association with the prevalence of cancer screenings. Duration of 1 to 5 years of services had the highest prevalence of having conducted the cancer screenings shown interrelation with the fact that female aged 18 years and above were encouraged to do breast screening. Whereas mammograms and PAP smear test were advised to be conducted among those having symptoms, married female respondents and gotten advice of doing by medical practitioners.

The annual health screening activity would suggest its importance to be maintained and promoted of doing not only due to occupational demands but also in concern with one's health. Hypertension seemed to be taken lightly with the circulating stigma that every aging individual would have developed high blood pressure due to age factors without knowing the fact that hypertension is a risk factor for occurrences of other serious health problems.

The age had significant association with hypertension in this study (p=.002), and similar findings was also observed in similar study (Parkash et. al, 2019). Most of the hypertensive respondents had completed Malaysian secondary level of education and were married. Yet, these findings fluctuated with other literature findings (Chauhan et. al, 2022; Hussain & Ajuwon, 2020; Kumar et. al, 2023; Parkash et. al, 2019).

The operational duty scope was the highest and duty patrols confined within operational duty scopes had shown to have significant association with the prevalence of hypertension (Chauhan et. al, 2022). Yet, these findings deflected with the current study conducted. Every security personnel, regardless of position rankings were inscribed with total of eight hours shift of working and had been found to have significant association with the prevalence of hypertension (p=.010) and had been reported in other similar studies (Chauhan et. al, 2022; Kumar et. al, 2023; Parkash et. al, 2019).

CONCLUSION

Overall findings revealed that the current study settings had practiced moderately good OH practices. Nonetheless, OH practices such as the yearly activity of health screenings needed to be continuously maintained in every working community to maintain good health.

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CONFLICT OF INTEREST

There was no conflict of interest.

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