

Determinants of the Utilization of a Noncommunicable Disease Screening Service by White Collar Workers in Depok City, West Java Indonesia

Abstract

Background: Noncommunicable disease (NCD) screening provides a means for early detection of chronic diseases, thereby reducing the risks posed by NCDs. In 2012, 56 million deaths were reported globally, 38 million of which were attributed to NCDs. In Indonesia, NCDs are a major cause of mortality. In Depok City, an NCD screening program among white collar employees has been in place since 2016. This study aimed to establish the determinants of NCD screening among workers at the Depok City Hall. **Methods:** The study used quantitative methods and a cross-sectional study design. It was conducted at Depok City Hall, Depok City, West Java, Indonesia. Data were collected using a self-reported questionnaire, which was pretested for validity and reliability. Data were analyzed using multiple logistic regressions. **Results:** Only 45.7% of workers had used the NCD screening service. Peer support ($P < 0.01$) and having pre-existing NCDs ($P < 0.05$) were the determinants of NCD screening among respondents. Peer support was the dominant factor associated with the utilization of NCD screening. After controlling for having NCDs, workers with adequate peer support had increased odds of uptake of NCD screening by more than two times (OR: 2.37, 95% CI: 1.29–4.37). **Conclusions:** Peer support is important in persuading workers to utilize NCD screening. Therefore, it is necessary to develop health promotion programs in the workplace and to empower peer educators to encourage their colleagues to undertake regular health screening.

Keywords: Health care utilization, Indonesia, non-communicable diseases, prevention and control

Introduction

Worldwide, including Indonesia, premature mortality due to four major categories of noncommunicable diseases (NCDs) is quite high. These four diseases are cardiovascular disease (CVD), cancer, chronic obstructive lung disease, and diabetes mellitus.^[1] Indonesia ranks fifth in the world for incidence of diabetes, and lung cancer is the leading cause of death among Indonesian males.^[2,3] According to Indonesian Basic Health Research, the prevalence of diabetes mellitus in the working-age population increased from 5.7% in 2007 to 6.9% in 2013.^[4] CVD has also undergone a significant increase, from 7.2% in 2007 to 29.4% in 2013.^[4] According to the Indonesian Ministry of Health, in 2015, the prevalence of hypertension among the adult population in West Java was 29.4%.^[5] In addition, among the productive-age population of West Java, two out of every 100 individuals have diabetes, and two out of every 1,000 individuals in the population aged

15 years and older have coronary heart disease.^[5] With regard to strokes, West Java ranks 14th out of 26 provinces, with the highest prevalence of strokes recorded in Depok City in West Java.^[5]

Although NCD screening provides an early means of chronic disease detection, such screening is rarely undertaken. Research has indicated that levels of awareness, treatment, and control of hypertension are particularly low in some developing countries.^[6] Research in Sub-Saharan Africa found that only 27% of people with hypertension were aware of their hypertension status because of lack of early detection, only 18% received treatment and only 7% had control of their blood pressure.^[7] Figures for developed countries are equally worrying. Research conducted in the United Kingdom found that only 43.7% of patients aged 32–74 years participate in NCD screening.^[8] In Germany, only 28.9% of the population participated in NCD screening in 2010.^[9] A study in Australia found that among individuals aged 45–49 years, only 30.3% took part in NCD

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screening.^[7] In China, the utilization of NCD screening services is 45.9%,^[10] and in Malaysia, only 41.9% of the male population aged 20–69 years participate in NCD screening.^[11]

According to Andersen's model, individual characteristics related to the utilization of health services include predisposition, enablement, reinforcement, and needs.^[12-14] Previous studies revealed that age, sex, peer support, perceived need, evaluated need, and attitude are related to an individual's willingness to take part in health screening.^[9] Other research has found that married individuals are more likely to utilize screening services than unmarried people.^[15] It has been found that those who do not utilize NCD screening services are less knowledgeable of the benefits of screening than those who use such services.^[16] Research conducted in Africa demonstrates a significant relationship between family support and health screening utilization.^[17]

Since 2016, an NCD screening program for white collar employees has been in place in their workplace's clinic while every employee has been scheduled at their work hours for one-time screening, but only 46% of workers have taken part in the program. The aim of this study was to ascertain the determinants of NCD screening uptake among white collar employees in Depok City.

Methods

Quantitative methods and a cross-sectional study design were used. The study was conducted from December 2017 to March 2018 in City Hall, Depok. Depok city is located in West Java Province and is a satellite city of Jakarta, the capital city of the Republic of Indonesia. Depok, with an area of 200.29 km², had a population of 2,179,813 people in 2016, with a density of 10,883 people/km². At 70.64%, the working-age population (aged 15–64 years) composes the largest proportion of Depok.^[18]

The research population consisted of 1,507 white collar workers, employed in 21 local government departments, located in Depok City Hall. For the purposes of this research, white collar workers were defined as professional and semi-professional employees^[19] who have been recorded as active full-time workers since 2016. Exclusion criteria included workers who were on leave, absent because of sickness at the time of the data collection, or pregnant at the time of the screening program. A required sample size of 350 was calculated, based on hypothesis testing of the difference of two proportions formula^[20] at the 95% confidence level and with 80% power of test for each independent variable. The sample was then calculated to include at least 305 workers to anticipate incomplete questionnaires, and the sample size was increased to 350 workers.

The number of workers and their names were collected from 21 local government departments. The sample was then

calculated proportionally, based on the number of workers in each department, and the sample was randomly chosen.

Data were collected using self-reported questionnaires that were pre-tested for validity and reliability.

Utilization of NCD screening was the dependent variable, and the independent variables consisted of (1) predisposing factors (age, gender, marital status, and knowledge of NCDs and NCD screening, and attitudes toward NCDs), (2) need factors (perceived symptoms and having NCDs); and (3) reinforcing factors (family support, peer support, and advice by a doctor). "Screened according to the guidelines" was used as the outcome, as all types of NCD exams were assessed, including weight, height, pulse, blood pressure, hemoglobin, glucose, and cholesterol at once. Perceived symptoms were measured using the question "Have you experienced any health problems in the past 12 months?" Subjects were also asked whether they had been diagnosed by a doctor with an NCD. Subjects were asked "During the past 12 months, has a doctor recommended that you have an NCD test?" Categorization of independent variables used the median value as the cut-off, since precise distribution was not possible. Age was categorized as adult (<45 years old) and pre-elderly (≥45 years old). Data were analyzed using a Chi-squared test and multiple logistic regressions, using SPSS software version 22.0 (IBM Corp., 2013, New York).

Results

The analyzed results indicate that the utilization of NCD screening services by workers in Depok City Hall is 45.7%. Only 51.1% of workers have had a hemoglobin test, while 67.4% have participated in glucose and cholesterol tests. Controlling for independent variability, 68% of the workers were adult, 56% were female, and almost all (90.3%) were married. More than half (70.9%) of the respondents had high knowledge of NCDs and NCD screening, but 75.7% expressed a negative attitude toward NCD screening. Based on need factors, only 30.9% of workers had perceived symptoms and 32.6% of workers had been diagnosed with an NCD. Meanwhile, with respect to family and peer support variables, 82.3% and 82.9% of the workers had adequate levels of support, respectively, and 87.1% of workers had been advised by a doctor to get screened [Table 1]. Based on bivariate analysis, 5 of 10 independent variables are candidates for multivariable analysis [Table 2].

A multivariable analysis observed that peer support ($P < 0.01$) and having a pre-existing NCD ($P < 0.05$) were determinants of utilization of NCD screening and peer support was the dominant factor related to the utilization of NCD screening. Workers with adequate peer support more than doubled the odds of undertaking NCD screening (OR: 2.37, 95% CI: 1.29-4.37) [Table 3].

Table 1: Utilization of NCD Screening Services by White Collar Workers in Depok City Hall

Variables	n	%
Utilization of NCD Screening		
Yes	160	45.7
No	190	54.3
Age		
Pre-elderly	112	32.0
Adult	238	68.0
Gender		
Female	196	56.0
Male	154	44.0
Marital status		
Married	316	90.3
Widow/widower	15	4.3
Unmarried	19	5.4
Knowledge		
High	248	70.9
Low	102	29.1
Attitude		
Positive	85	24.3
Negative	265	75.7
Perceived symptom		
Yes	108	30.9
No	242	69.1
Having NCD		
Yes	114	32.6
No	236	67.4
Family support		
Adequate	288	82.3
Less	62	17.7
Peer support		
Adequate	290	82.9
Less	60	17.1
Advised by doctor		
Yes	305	87.1
No	45	12.9

NCD=Noncommunicable diseases

Discussion

The utilization of NCD screening by workers at Depok City Hall was at 45.7%. Peer support and having an NCD are significantly associated with utilization of NCD screening. This result was controlled by a multivariable analysis using logistic regression to minimize confounding bias. In addition, since the sample was calculated proportionally across each local government department and randomly chosen, this result represents the study population. The results of this research are in line with the findings from other developing countries, such as China (45.9%)^[10] and Malaysia (41.9%).^[11] A possible explanation for this finding is that white collar workers do not have appropriate

Table 2: Determinants Associated with the Utilization of NCD Screening Services

Independent Variables	Utilization of NCD Screening		P	OR (95% CI)
	Yes	No		
Age				
Pre-elderly	51.8%	48.2%	0.147*	1.43 (0.91-2.25)
Adult	42.9%	57.1%		
Gender				
Female	45.4%	54.6%	0.983	0.97 (0.64-1.49)
Male	46.1%	53.9%		
Marital status				
Married	45.6%	54.4%	0.123*	4.33 (1.02-18.38)
Widow/widower	66.7%	33.3%		1.18 (0.67-4.89)
Unmarried	31.6%	68.4%		
Knowledge				
High	48.8%	51.2%	0.092*	1.54 (0.96-2.46)
Low	38.2%	61.8%		
Attitude				
Positive	49.4%	50.6%	0.508	1.22 (0.75-1.99)
Negative	44.5%	55.5%		
Family support				
Adequate	46.5%	53.5%	0.605	1.21 (0.69-2.01)
Less	41.9%	58.1%		
Peer support				
Adequate	49.3%	50.7%	0.005*	2.46 (1.34-4.51)
Less	28.3%	71.7%		
Perceived symptom				
Yes	47.2%	52.8%	0.793	1.09 (0.69-1.72)
No	45.0%	55.0%		
Having NCDs				
Yes	55.3%	44.7%	0.017*	1.77 (1.13-2.77)
No	41.1%	58.9%		
Advised by doctor				
Yes	46.9%	53.1%	0.325	(0.76-2.77)
No	37.8%	62.2%		

*Candidates into multivariate modeling. NCD=Noncommunicable diseases

knowledge about NCD screening guidelines, especially about complete types of NCD tests. Therefore, socialization regarding NCD screening guidelines should be considered when advising workers to participate in NCD screening. In addition, tight work schedules may present a barrier to participation in NCD screening. If workers are given the ability to take time off work, they are more likely to uptake screening.^[21]

Previous research has suggested that social support promotes the uptake of early detection measures.^[21-23] This is supported by the findings of this research. Work colleagues at Depok City Hall can facilitate the uptake of screening services by, for instance, filling in for their

Table 3: Multivariable Analysis of Determinants of Utilization of NCD Screening Services

Variables	B	P	OR	95% CI
Age	0.314	0.199	1.37	0.85-2.21
Gender	-0.510	0.826	0.95	0.60-1.49
Marital status	0.120	0.602	1.13	0.72-1.78
Knowledge	0.503	0.050	1.65	0.99-2.74
Attitude	0.115	0.663	1.12	0.67-1.88
Perceived Symptom	-0.191	0.461	0.83	0.49-1.37
Having NCD	0.604	0.021	1.83	1.09-3.05
Family support	-0.172	0.606	0.84	0.44-1.62
Peer support	0.920	0.010	2.51	1.25-5.04
Advised by doctor	-0.064	0.860	0.94	0.46-1.89
Constant	-1.570	0.015	0.21	

NCD=Noncommunicable diseases; CI=Confidence interval

co-workers when these co-workers take time off to undergo NCD screening. Additionally, the prospect of not being alone after receiving a diagnosis could reduce worriedness about participating in a medical check-up.^[9]

Existing chronic conditions represent a potential need for healthcare use. This study demonstrates that having an NCD is related to utilization of NCD screening services. Workers who had been previously diagnosed with an NCD increased the odds of utilizing screening services by 1.7 times, compared to their colleagues who did not have pre-existing NCDs, after controlling for peer support. This indicates that workers who are worried about their health are more likely to utilize free screening services. In addition, workers who take part in NCD screening may have the wisdom to compare the results of previous examinations with those obtained from a workplace NCD screening. These findings are comparable to other studies that have found that patients with chronic illness are more likely to use health services.^[9,10,24,25] This suggests that chronic diseases play a critical role in increasing health service utilization by promoting more positive personal perceptions.

Knowledge is an important driving factor in behavioral change.^[10] This research found that knowledge is unrelated to the utilization of NCD screening services. Although workers had good knowledge about the benefit of NCD screening, they did not know how many NCD tests they had to take. Therefore, it is necessary that NCD screening guidelines are more widely disseminated.^[26]

This study found the same level of utilization of NCD screening among the adult group and the pre-elderly group, although some workers who had already been informed by doctors that they had NCDs failed to utilize NCD screening. This result is consistent with those of previous studies^[26] and may be caused by lack of time, as has been found in other research.^[21]

No difference was found between male and female utilization of NCD screening. Previous research has found

that both male and female workers believe they are in good health and thus have no use for NCD screening.^[26,27] A person who feels healthy, free of pain, and with no obvious signs of disease is less likely to seek out preventive healthcare services such as screening.^[28]

Attitude is a determinant of individual health behaviors.^[12] Many workers had a negative attitude toward NCD screening and thus did not take part in the complete NCD screening test. The findings of this study indicate that approximately half of the workers in Depok City Hall perceive that screening tests do not need to be routinely carried out, and they will only undertake screening if they have free time. Similar findings from previous research indicate that people who fear pain or embarrassment will not use screening services.^[29]

The limitations of this cross-sectional study should be considered. Because of the cross-sectional nature of the study, associations, but not causal relationships, could be determined. Recall bias may have been present as respondents recalled their experiences of utilizing NCD screening in their workplace almost two years earlier. However, this bias was minimized by contrasting respondents' answers with District Health Office's technical report of NCD screening program. In addition, since the respondents knew the research was conducted by health scientists, the socially desirable effect may have been raised, especially with regard to utilizing NCD screening.

In conclusion, providing access to free-of-charge NCD screening in the workplace is not enough to ensure the uptake of such screening. NCD screening should be accompanied by a health education program to increase employees' awareness of the need for screening and to increase knowledge of NCD screening test guidelines. To increase utilization rates, workers who take part in routine annual screening and who have been declared healthy by local health departments following completion of the screening program could be rewarded.

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Ethical clearance

The study was approved by the Research and Community Engagement Ethics Committee Faculty of Public Health, University of Indonesia (Certificate number: 625/UN2.F10/PPM.00.02/2017).

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Conflicts of interest

There are no conflicts of interest.

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References

1. Roth GA, Huffman MD, Moran AE, Feigin V, Mensah GA, Naghavi M, *et al.* Global and regional patterns in cardiovascular mortality from 1990 to 2013. *Circulation* 2015;132:1667-78.
2. Zhou B, Lu Y, Hajifathalian K, Bentham J, Di Cesare M, Danaei G, *et al.* Worldwide trends in diabetes since 1980: A pooled analysis of 751 population-based studies with 4.4 million participants. *Lancet* 2016;387:1513-30.
3. Bray F, Ferlay J, Soerjomataram I, Siegel RL, Torre LA, Jemal A. Global cancer statistics 2018: GLOBOCAN estimates of incidence and mortality worldwide for 36 cancers in 185 countries. *CA Cancer J Clin* 2018;68:394-424.
4. National Institute of Health Research and Development. National Report on Basic Health Research (Riskesdas) 2013. Laporan Nasional 2013. Jakarta; 2013.
5. Ministry of Health Republic of Indonesia. Overview of Food Consumption, Nutritional Problems and Non-Communicable Diseases in West Java; 2015.
6. Kearney PM, Whelton M, Reynolds K, Whelton PK. Worldwide prevalence of hypertension: A systematic review. *J Hypertens* 2004;22:11-9.
7. Ataklte F, Erqou S, Kaptoge S, Taye B, Echouffo-Tcheugui JB, Kengne AP. Burden of Undiagnosed Hypertension in Sub-Saharan Africa. *Hypertension* 2015;65:291-8.
8. Cochrane T, Gidlow CJ, Kumar J, Mawby Y, Iqbal Z, Chambers RM. Cross-sectional review of the response and treatment uptake from the NHS Health Checks programme in Stoke on Trent. *J Public Health (Oxf)* 2013;35:92-8.
9. Hoebel J, Starker A, Jordan S, Ritcher M, Lampert T. Determinants of health check attendance in adults: Findings from the cross-sectional German Health Update (GEDA) study. *BMC Public Health* 2014;14:1-12.
10. Li Y, Nong DX, Wei B, Feng QM, Luo HY. The impact of predisposing, enabling, and need factors in utilization of health services among rural residents in Guangxi, China. *BMC Health Serv Res* 2016;16:1-10.
11. Teo CH, Ng CJ, White A. Factors influencing young men's decision to undergo health screening in Malaysia: A qualitative study. *BMJ Open* 2017;7:e014364.
12. Green LW, Kreuter MW. Health Promotion Planning: An Educational and Ecological Approach. 4th ed. New York: McGraw-Hill; 2005.
13. Andersen R, Newman JF. Societal and individual determinants of medical care utilization in the United States. *Milbank Q* 2005;83. doi: 10.1111/j.1468-0009.2005.00428.x.
14. Andersen RM. Revisiting the behavioral model and access to medical care: Does it matter? *J Health Soc Behav* 1995;36:1-10.
15. Janßen C, Sauter S, Kowalski C. The influence of social determinants on the use of prevention and health promotion services: Results of a systematic literature review. *Psychosoc Med* 2012;9:Doc07.
16. Dryden R, Williams B, Mccowan C, Themessl-Huber M. What do we know about who does and does not attend general health checks? Findings from a narrative scoping review. *BMC Public Health* 2012;12:1.
17. Brittain K, Taylor JY, Loveland-Cherry C, Northouse L, Caldwell CH. Family support and colorectal cancer screening among urban African Americans. *J Nurse Pract* 2012;8:522-33.
18. Central Bureau of Statistics. Kota Depok dalam Angka 2016. Central Bureau of Statistics; 2016.
19. Hammer CA, Ferrari JR. Differential incidence of procrastination between blue and white-collar workers. *Curr Psychol* 2002;21:333-8.
20. Lemeshow S, Hosmer DW Jr, Klar J, Lwanga SK. Part 1: Statistical methods for sample size determination. Adequacy Sample Size in Health Studies 1990;247. Available from: http://apps.who.int/iris/bitstream/10665/41607/1/0471925179_eng.pdf?ua=1. [Last accessed on 2019 Jul 12].
21. Katapodi MC, Facione NC, Miaskowski C, Dodd MJ, Waters C. The influence of social support on breast cancer screening in a multicultural community sample. *Oncol Nurs Forum* 2002;29:845-52.
22. Bronner K, Mesters I, Weiss-meilik A, Geva R, Rozner G, Strul H, *et al.* Patient education and counseling determinants of adherence to screening by colonoscopy in individuals with a family history of colorectal cancer. *Patient Educ Couns* 2013;93:272-81.
23. Mishra SI, DeForge B, Barnett B, Ntiri S, Grant L. Social determinants of breast cancer screening in urban primary care practices: A community-engaged formative study. *Womens Heal Issues* 2012;22:e429-38.
24. Dey M, Jorm AF. Social determinants of mental health service utilization in Switzerland. *Int J Public Health* 2017;62:85-93.
25. Venkataraman K, Wee HL, Ng SH, Rebello S, Tai ES, Lee J, *et al.* Determinants of individuals' participation in integrated chronic disease screening in Singapore. *J Epidemiol Community Health* 2016;70:1242-50.
26. Si S. Evaluations of the 45-49 Year Old Health Check Program in Australian General Practice. University of Adelaide; 2014.
27. Tessaro I, Mangone C, Parkar I, Pawar V. Knowledge, barriers, and predictors of colorectal cancer screening in an Appalachian church population. *Prev Chronic Dis* 2006;3:A123.
28. Mi Oh Kyeung, Jacobsen KH. Colorectal cancer screening among Korean Americans: A systematic review. *J Community Health* 2014;39:193-200.
29. Maxwell AE, Crespi CM, Antonio CM, Paiyun L. Explaining disparities in colorectal cancer screening among five Asian ethnic groups: A population-based study in California. *BMC Cancer* 2010;10:214-22.