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Obesity and Hypertension Pattern among Selected Group of Employed and Non-Employed Adults in Kandy District, Sri Lanka

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***Abstract*—** Non communicable diseases (NCDs) are the leading causes of deaths globally, killing people in each year than all other causes combined. Aim of this study was to determine the pattern obesity and hypertension among selected group of employed and non-employed adults, in Kandy District, Sri Lanka. The data were collected from employed (n=350) and unemployed (n=550) who attended health promotion programmes in the district of Kandy, Sri Lanka. Height and weight were measured. BMI was calculated. Blood pressure (BP) was measured. Among the employed adults, there were 247 females (70.6%) while 385 females (75.5%) were among the unemployed adults. mean age of employed and unemployed were 38.5 ±10.4 and 42.6 ±11.6 respectively. Mean BMI of employed was 23.6 Kgm^{-2} ±4.12 whereas the mean BMI of unemployed group was 24.6 Kgm^{-2} ±4.64. It was found that 12.8% of employed were obese while 19.2% unemployed were obese. Study revealed that 19.4% of employed were hypertensive while 19.6 % of unemployed were hypertensive.

***Keywords*—** Employed; unemployed; obesity; hypertension.

I. INTRODUCTION

Non communicable diseases (NCDs) are the leading causes of death globally, killing people each year than all other causes combined [1]. Worldwide, non-communicable diseases (NCD) represent 43% of the burden of disease which are expected to be responsible for 60% of the disease burden and 73% of all deaths by 2020 (2). Most of this increase will be accounted for by emerging non communicable disease epidemics in developing countries [2].

NCDs are major burden in industrial countries, and are rapidly increasing in developing countries owing to demographic transition and changing the lifestyle in people [3]. NCDs are estimated the distribution of deaths by region, non-communicable diseases ranked first as the cause of death in developed countries, as well as in many developing countries and the world as a whole. In the developed countries, three out of every four deaths are due to cardio-vascular disease (CVD), cancer, or accidents or other violent causes [4].

Labor force of a country is defined as the stem of any particular community [7]. Therefore concerning their health status should be given a priority by the relevant authorities. This study aims to assess the risk of the major risk factors on NCDs (biological and anthropometric) among selected group of the labor force in Kandy District Sri Lanka.

According to the national labor force survey overall unemployment rate in Sri Lanka reported as 4.1% and for female is 6.1% and it is 3.0% for male [8]. Also it was found that unemployment among those who are in age group 25-29 and over 30 years were 8.6% and 4.1% respectively [8]. Unemployment status negatively effects on national productivity. Many studies have shown that unemployed adults showed significantly higher level of distress, short and long-term disabilities and many health problems including hypertension [9]. Similarly studies revealed that the employed adults are also vulnerable for hypertension, obesity which are caused by the unhealthy dietary pattern, work load and the sedentary lifestyle [10]. Nevertheless the research done on compare the health status among employed and unemployed is limited [10], [13]. Identification of the severity of risk factors on NCDs which influencing on both employed and unemployed, and documenting them is essential to take measures on preventing deleterious health conditions in the future. And also describing differences of NCD risk factors between these two groups may shed additional insight in to the association between employment status, occupation type and healthy work effect. Present study documents the pattern of overweight, obesity and the hypertension among selected group of employed and unemployed adults as well as examine the risk of overweight and hypertension according to their occupation categories.

II. OBJECTIVE

General objective

To determine the obesity and hypertension pattern in selected group of employed and unemployed adults in Kandy district, Sri Lanka

Specific objectives

- To determine the risk level of obesity and overweight.
- To determine the anthropometric and biological risk among employed adults based on their working condition.
- To compare the risk of overweight, obesity and hypertension between employed and unemployed adults

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III. METHODS

The secondary analysis of this descriptive study was done based on data which were collected from employed and unemployed adults who attended for a health promotion programme held in Kandy District, Sri Lanka.

This study population comprised by employed (n=350) and unemployed (n=510) who were screened at the health promotion programme. This health promotion programmes were implemented in selected villages as well as the work places in Kandy District, Sri Lanka. During the programme, all the participants had been screened for blood pressure (BP) and also the height and weight were measured then the BMI was calculated. All the adults who were screened at the village level programme and those who did not engage with any occupation were considered as the unemployed and all the adults who were screened at the workplaces were included in the employed group. Employed adults were assigned in to four groups based on their occupation types. Therefore the employed adult group was consisted by bus workers (drivers and conductors), school teachers, office workers and field workers (those who engaged with the field activities such as land mining and constructions). Information of pregnant women and those who did not have enough data were excluded from the analysis process.

Hypertension status was described according to the JCN 7.0 (Subjects were considered to have hypertension if their systolic blood pressure was at above 140 mmHg and the diastolic blood pressure was at above 90 mmHg) [11]. Weight and height of the participants were measured during the health promotion programmes. Weight was measured with a precision of 100g with electronic weigh scale and height was measured with a precision of 1 cm with the setediometer (Seca 120). The body mass index (BMI) was calculated by dividing weight in kilograms by height meters squared. Underweight, normal weight, overweight and obesity were defined according to the WHO cut-off values for Asian countries [(12)].The statistical analysis was performed with the SPSS 16.0 version. The level of significance was $p< 0.05$.

IV. RESULTS

Characteristics of the study variables are summarized in table I. Among the employed adults (n= 350), there were 70.6% (n=247) females in the group. Mean age of the employed adult was 38.5 (± 10.4, 95 %CI). It was found that mean BMI, SBP and DBP were 23.67 Kgm^{-2} ± 4.12, 95 % CI), 124.06 mmHg (± 1.99, 95% CI), 81.4 mmHg (± 9.37, 95%CI).

TABLE I. Characteristics of employed and unemployed adults.

Characteristics	Employed	%	Unemployed	%
Male	103	29.4	125	24.5
Female	247	70.6	385	75.5
Age	38.5 (±10.4)		42.6 (± 11.6)	
BMI	23.67 (± 4.12)		24.6 (± 4.64)	
SBP	124.6 (± 1.99)		125.6 (± 1.77)	
DBP	81.4 (± 9.37)		78.9 (± 9.6)	

Among the unemployed adults (n= 510) there were 24.5% males. Mean age of unemployed adults was 42.6 (± 11.6). Mean BMI, SBP and DBP were 24.6 Kgm^{-2} (± 4.64, 95% CI), 125.6 mmHg (± 1.77, 95% CI) and 78.9 mmHg (± 9.6, 95% CI) respectively.

The pattern of obesity and overweight among employed and unemployed adults

Among the employed group, 12.8 % (n=45) individuals were categorized in obesity group and 13.1% (n=46) individuals were categorized in the overweight category. Among the unemployed group 22.9 % (n=171) were overweight while 19.2% (n= 98) adults were categorized in obesity groups while 3.5% (n=18) were underweight (table II).

TABLE II. Characteristics of BMI among employed and unemployed.

	Employed adults		Unemployed adults	
	Number	%	Number	%
Overweight	46	14.8	171	22.9
Obesity	45	12.8	98	19.2

Hypertension status of employed and unemployed adults

Study revealed that 19.4 % of employed were hypertensive while 19.6 % of unemployed were hypertensive. Furthermore, it was found that systolic and diastolic blood pressure of employed adults were 14% and 5.4% respectively while the systolic and the diastolic blood pressure of unemployed were 14.% and 5.5% respectively (table III).

TABLE III. Hypertension status of employed and unemployed adults.

	Employed adults		Unemployed adults	
	Number	%	Number	%
Systolic BP	49	14	72	14.1
Diastolic BP	19	5.4	28	5.5

TABLE IV. Blood pressure and hypertension status according to the occupation categories of employed adults.

Job Category	Overweight (%)	Hypertension (%)
Bus workers (Drivers and Conductors)	22.6	18
Field Workers	21	17.2
Office Workers	24	20.5
Teachers	23	22.6

Results revealed that the risk of overweight in bus workers, field officers, office workers and school teachers were 24%, 21%, 23% and 22.6% respectively while the hypertension were 18%, 17.2%, 20.5% and 22.6% respectively (table IV).

V. DISCUSSION

The labor force of a country includes both employed and unemployed in a particular country. Health status of this groups must be concerned as it is the crucial factor for getting them involved in development of a country. Researchers have found that being employed helps people to improve their wellbeing in various ways such as, to economically stable, to fulfil psychosocial needs and for improve the physical and mental health [7]. Also health status of unemployed adults should be concerned as they face major mental and physical health problems [8]. Proposed study assessed the overweight, obesity and hypertension status among employed and

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unemployed adults. There were 350 employed including 64 bus drivers, 144 officer workers, 69 of them field workers and 73 school teachers. And 510 unemployed adults

Findings of the present study indicated that the risk of overweight and obesity among employed adults were 14.8 % and 12.8% respectively. Prevalence of overweight and obesity among unemployed were 23.9 % and 19.2% respectively (table I). Although the risk of overweight was greater in both groups, It was clearly found that the risk of overweight and obesity was prevalent among unemployed adults. Present study confirms the findings of previous studies which confirmed that the prevalence of overweight and obese was high in unemployed adults [13], [14].

It is evident that the BMI has shown a greater increase between 1980 and 2013 from 28.8% to 36.9% in men, and from 29.8% to 38.0% in women [14], [18]. Also WHO reported that in 2008, 35% of adults aged 20+ were overweight and the prevalence of obesity has nearly doubled between 1980 and 2008 [15]. In Sri Lanka, it is documented that the prevalence of overweight and obesity of Sri Lankan adults were 25.2% and 9.2% respectively [16]. With compared to the previous findings with the present study, risk level of overweight and obesity in both groups were found to be similar national figures which is not similar with the global figures.

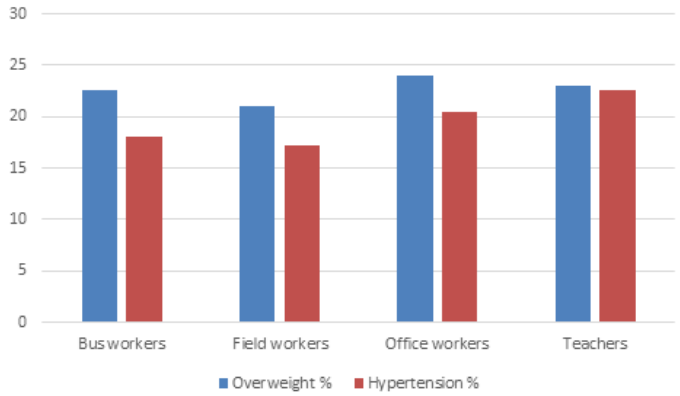

Fig. 1. Characteristics of boverweight and hypertension among employed adults.

Overall results depicts that the employed adults were likely to be overweight and obese compared to the unemployed adults. Table IV describes that office workers had greater risk to be overweight (>25Kgm^{-2}) compared to the others. Also the school teachers were shown a greater risk of being overweight. Risk of being overweight among field workers was less compared to others. In terms of risk of hypertension, school teacher and officer workers showed a greater risk of being hypertensive compared to other categories. Many studies revealed that school teachers are more vulnerable for hypertension due to many reasons such as stressful circumstances while teaching at the class room, poor dietary pattern and sedentary lifestyle [27-30]. Even though the bus workers were having less risk of getting hypertensive with compared to the other workers, they were found to be with a higher risk of hypertension. Risk of hypertension was less among field workers compare to others. World Health Organization found that the prevalence of raised blood pressure was consistently high, with low, lower middle and upper middle countries all having rates of around 40% [16]. In Sri Lanka, prevalence of the hypertension over 20 years was 28.36% and around 12% of adults were found with pre-hypertension [17]. Even though the hypertension status among employees of the present study did not match with the international figures, they were quite similar to the local statistics.

Bus driver's category showed a considerable risk of being overweight (>23.4Kgm^{-2}), hypertension (SBP >140 or DPB > 90). It has been revealed that most of bus workers have various issues in their lifestyle such as irregular sleeping habits, stressful circumstances, irregular eating habits and also they patronize foods from fast food outlets and furthermore most of them are inactive since their work is more sedentary and most of them don't have time to get physically active in their day to day life [19], [20]. Studies have shown that the opportunity for getting physically active in four domains (households, working, transport and leisure time) is very less among bus workers [21]. Previous studies have indicated that the prevalence of alcohol and tobacco consumption among bus workers was higher than other workers [21]. In the present study, percentages of overweight and hypertension among employees who engaged with field work were found to be less compared to other workers (Figure 1). It is possible that field workers are likely to be more physically active in the working domain which would attribute to have a lower risk of being overweight with compared to other employee groups. Since the present study did not focus on dietary and physical activities, an assumption cannot be made to find out the underlying causes of disparities in overweight and hypertension between occupation types.

When it comes to the unemployed adult's group, 22.9 % of adults were overweight (23.4-27 Kgm^{-2}) and 19.2 % were obese. Although the percentages of obesity in unemployed adults was consistent with the national statistics [15], [22], percentage of obesity of the group was found to be doubled compared to the national figures. Also the present study indicated that the risk of being hypertensive in unemployed group was classified as 19.6% which was less that the prevalence of hypertension in Sri Lanka [17], and similar to the prevalence of hypertension among adults in Central Province, Sri Lanka [23]. Therefore the number of individuals those who were in unemployed category, found with hypertension. Even though the studies have concluded that the hypertension is prevalent among unemployed adults [24], [25], Few studies indicated that being unemployment is an protective factor for hypertension [26].

From the study, it was concluded that the overweight, obesity and hypertension were found to be more prominent in adult's unemployed category than the employed category. One of the reasons for this variation would be, this wasn't a representative sample of employed and unemployed community. Another reason would be, people who are living with diseases or risk factors likely to be attend this kind of

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health promotion camps which provide knowledge and skills on controlling their risk factors. Therefore significant amount of people who are living with diseases or/and risk factors likely to be appeared at this kind of events. Similarly people who believe that they are healthy, won't be appeared as they don't need to get exposure to screenings.

When we compare the overweight and hypertension between unemployed and employed adults, we can clearly see that in some point risk level of employed is greater than unemployed adults. Risk of being overweight, hypertensive and getting diabetes among employed adult is greater than unemployed adults. In terms of risk of obesity among unemployed adults is greater than employed adults. It was fund that majority of adults in normal weight represent the employed group.

VI. Limitation of the Study

Present study has some limitations. First, there was some difficulties to generalize the results to all the employed and unemployed adults in Kandy District as this was not a representative sample. Although the sample size was quite high, the scientific validity of the study was less as statistical method had not been applied to recruit the sample. Present study did not have much demographic information such as their income, religion, education level, etc. which would useful to ensure the strength of the study. Present study did not focus on dietary information and physical activity data which would useful to illustrate the nutritional pattern of these two groups. There was an opportunity to occur the selection bias as usually people who were living with various health issues and health conscious people were likely to attend health screening programmes in the general communities. Also those who know that they were living with health conditions likely to not to attend health camps at work places.

VII. Conclusion

According to the results, we can assume that employed adults in a particular community is at risk of getting risk factors for NCDs in their early stage of life. Risk of being overweight, hypertensive and diabetes among employed adults is greater than the unemployed adults. These results may be caused by unhealthy dietary practices, sedentary life style and stressful circumstances in day to day life among employed adults. Also adults who have an opportunity to being active in the working domain, have less opportunity to being overweight and obese. Even though current research did not focus on calculated sample, findings may useful for future project designs.

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References

[1] World Health Organization, *Global Status Report on Non Communicable Diseases*, Geneva: WHO, 2010.
[2] World Health Organization, *Non-Communicable Diseases Surveillance*, WHO, 2011
[3] C. J. L. Murray and A. D. Lopez, "Mortality by cause for eight regions of the world: Global Burden of Disease Study," Lancet, vol. 349, pp. 1269–1276, 1997.
[4] R. Fuentes, N. Ilmaniemi, E. Laurikainen, J. Tuomilehto, and A. Nissinen, "Hypertension in developing economies: A review of population-based studies carried out from 1980 to 1998," *Journal of Hypertension*, vol. 18, pp. 521–529, 2000.
[5] E. Cafiero et al., "The global economic burden of non communicable diseases," 2012. http://ideas.repec.org/p/gdm/wpaper/8712.html.
[6] G. Waddell and A k. Burton, *Is work good for your health and well-being?*, The stationary office (TSO), vol. 46, issue 1, 2004.
[7] M W Linn, R Sandifer, and S Stein, "Effects of unemployment on mental and physical health," *American Journal of Public Health*, vol. 75, issue 5, pp. 502–506, 1985.
[8] Sri Lanka labour force statistics quarterly bulletin, Sri Lanka labour force survey 2014.
[9] C. Arcy and C. M. Siddique, "Unemployment and health: An analysis of "Canada health survey" data," *International Health Survey*, vol. 15, no. 4, pp. 609-635, 1985.
[10] N. O. Addo, M. Kofi, K. Nyar, O. Samuel, H. Sackey, A. Patricia, and S. Bismark, "Prevalence of obesity and overweight and associated factors among financial institution workers in Accra Metropolis, Ghana: a cross sectional study Prince," BMC Res Notes, 8:599, 2015.
[11] Seventh report of the joint national committee on prevention, detection, evaluation and treatment of high blood pressure (JNC 7).
[12] World Health Organization report: Appropriate body-mass index for Asian populations and its complications for policy and intervention strategies.
[13] J. Alberto, C. Martinez, J. David J. G. Elizabeth, P. Evelyn P. Davila, E. L. Fleming, G. William, L. Blanc, L. Kristopher, E. Kathryn, L.C. Sharon L, J. F. Zimmerman, C. Muntaner, and A. Julie, "Health indicators among unemployed and employed young adults," *Journal of Occupation Environment*, vol. 53, issue 2, pp. 196–203, 2011.
[14] M. Ng, T. Fleming, M. Robinson Blake Thomson, N. Graetz, and C. Margono, "Global, regional, and national prevalence of overweight and obesity in children and adults during 1980–2013: a systematic analysis for the Global Burden of Disease Study 2013," vol. 384, no. 9945, pp. 766–781, 2014.
[15] P. Katulanda, M. A. Jayawardena, M. H. Sheriff, G. R. Constantine, Dr. Matthews, "Prevalence of overweight and obesity in Sri Lankan adults,' *Pubmed*, vol. 11, issue 11, pp. 751-756, 2010.
[16] Global Health observatory (GHO), Obesity situation and trends. World health organization, 2012.
[17] P. Katulanda., V. Gunawardena, G. R. Constantine, M. H. R, Sheriff, and Dr. Matthews, "Prevalence and correlates of hypertension in Sri Lanka," Ceylon College of Physicians, 2009.
[18] C. Ersoy and S. Imamoglu, "Comparison of the obesity risk and related factors in employed and unemployed (Housewife) premenopausal urban woman," Diabetes Research Clinical Practice, vol. 72, issue 2, pp. 190-196, 2006.
[19] G. E. Hedberg, L. Wikström-Frisén, and U. Janler, "Comparison between two programmes for reducing the levels of risk indicators of heart diseases among male professional drivers," Occup Environ Med; vol. 55, issue 8, pp. 554–561, 1998.
[20] B. C. Satheesh and R. M. Veena, "A study of prevalence of hypertension among bus drivers in Bangalore City," *IJCRR*, vol. 5, issue 17, pp. 90-94, 2013.
[21] A. Lakshman, N. Manikath, and A. Rahim, and V. P. Anilakumari, "Prevalence and risk factors of hypertension among male occupational bus drivers in North Kerala, South India: A Cross-sectional Study," PMCID: PMC4045462.
[22] P. Katulanda, P. Ranasinghe, R. Jayawardena, G. R. Constantine, R. Sheriff, and D. R. Matthews, "The prevalence, predictors and associations of hypertension in Sri Lanka: a cross-sectional population bases national survey," *Clinical Experience on Hypertension*, vol. 36, issue 7, pp. 484-491, 2014.

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[23] S. Mendis, P. Ranasinghe, and B. D Dharmasena, "Prevalence of hypertension in Sri Lanka. A Large population study in the central province," vol. 102, issue 5, pp. 455–462, 1988.
[24] R. M Brackbill, P. Z. Siegel, and S. P. Ackermann, "Self-reported hypertension among unemployed people in the United States," *BMJ*, vol. 310(6979), pp. 568, 1995.
[25] V. Kuralselvi and V. Ramya, "Prevalence of hypertension among employed and unemployed woman at Kulithalai Talkua," *Cauvery Research Journal*, vol. 2, issue 2, pp. 66, 2009.
[26] J. B. Barbosa, A. A. M.da Silva, A. M. D. Santos, F. D. M. Junior, M. Barbosa, F. Neto, N. Jesus, S. Soares, V. Nina, and J. Barbosa, "Prevalence of arterial hypertension and associated factors in adults in Sao Luis, State of Maranhao," vol, 2:6, 2009.
[27] A. A. AL-Nooh, A. A. A. Alajmi, and D. Wood, "The Prevalence of Cardiovascular Disease Risk Factors among Employees in the Kingdom of Bahrain between October 2010 and March 2011: A Cross-Sectional Study from a Workplace Health Campaign," Cardiology Research and Practice, vol. 2014, pp. 9, 2014.
[28] L. Olaitan, "Prevalence of job stress among primary school teachers in South West, Nigeria," *African Journal of Microbiology Research*, vol. 3, issue 8, 2009.
[29] A. Grew, Z. Gad, A. Mandil, M. Wagdi, and A. Elneihoum, "Risk factors for Cardio Vascular Diseases among school teachers in Benghazi, Libya," *Ibnosina Journal of Medicine and Biomedical Sciences*, vol. 2, issue 4, pp. 168-177, 2010.
[30] W. Brito, L. Santos, A. Marcolongo, D. Campos, S. Bocalini, L. Antonio, A. Silva, J. Tucci, and J. Serra, "Physical activity level in public school teachers," *US National libra*, 2012.

C. P Senavirathne, N. D. Dhanapala, P. de Silva, and M. Fernando, "Obesity and hypertension pattern among selected group of employed and non-employed adults in Kandy District, Sri Lanka," *International Journal of Scientific and Technical Advancements*, Volume 2, Issue 1, pp. 155-159, 2016.