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## **Prevalence of Obesity and Health-Promoting Lifestyle among Nurses in a Tertiary Hospital, Malaysia**

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### **Abstract**

The study was conducted to determine the prevalence of obesity and health-promoting lifestyles among nurses in a tertiary hospital, Malaysia. Descriptive cross-sectional study of 417 nurses was conducted between July and August 2022 using the Health-Promoting Lifestyle Profile II (HPLP-II) scale. The study found majority of the respondents were obese ( $n = 233, 55.9\%$ ). The total score of Health-Promoting Lifestyle Profile II (HPLP-II) was  $142.46 \pm 22.70$ . Body Mass Index and health responsibility were statistically correlated ( $r = 0.129, p = 0.009$ ). Obesity among nurses is prevalent. Body weight management and exercise programs should be implemented to achieve healthy lifestyle among nurses.

**Keywords:** Nurse(s), Health-Promoting Lifestyle Profile (HPLP), Body Mass Index (BMI), Obesity

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### **1.0 Introduction**

Each individual's health-promoting lifestyle activity is influenced by their way of life (Baral et al., 2020). The World Health Organization (WHO) 2012 announced that lifestyle-related diseases account for 40–50% of fatalities in less developed nations and 70–80% in affluent nations. According to Estebarsari et al. (2019), a global assessment of health and quality of life (QOL) conducted by the World Health Organization (WHO) shows that 60% of QOL is lifestyle-dependent. The term "lifestyle" refers to the conditions and manner of human existence. It combines behavioural patterns and individual habits, resulting in socialisation and increased overweight and obesity. Furthermore, according to World Health Organization (WHO) (2016), 6% of deaths annually mortality globally are due to excess weight and obesity and increased cardiovascular disease, colorectal cancer, diabetes, hypertension, anxiety, depression, osteoporosis, lipid disorders (Saad et al., 2020). According to projections, by 2030, 1.12 billion adults (20%) and 2.16 billion adults (38%) will be overweight or obese (Zubery et al., 2021). The discovery projection shows a significant increase in morbidity and disability due to non-communicable diseases. In addition, occupation is related to socioeconomic circumstances and lifestyle choices, including sedentary behaviour and physical inactivity. Hence it is thought to be a predictor of obesity. Furthermore, the economic transformation has also led to the adaptation of low physical activity occupations involving more sedentary activities.

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In Malaysia, 30.4% of adults are overweight, and 19.7% are obese (Ministry of Health, 2014 & National Health Morbidity Survey [NHMS], 2019). However, due to the nature of their employment, socioeconomic conditions, and lifestyle choices, nurses are more exposed to the risk factors for overweight and obesity. According to Kunyahamu et al. (2021), over time, healthcare workers have shown a trend towards obesity and have higher obesity rates than the general population. The study was conducted on all government healthcare workers on the east coast of Peninsular Malaysia; the results showed that half of the healthcare workers had a normal Body Mass Index (BMI), while the other half were overweight and obese (Kunyahamu et al., 2021). In addition, 46.1% of respondents to research the prevalence of overweight and obesity among healthcare professionals in Selangor were either overweight or obese (Kit et al., 2020). Moreover, prevalence research in Perak revealed that 79.6% of healthcare workers had a high body fat percentage, 49.9% were overweight or obese, and 51.0% were at risk of developing abdominal obesity (Kit et al., 2020).

Individuals' daily behaviours are referred to as their lifestyles (Keele, 2019). The aim of this study was to add new knowledge after gathering preliminary data on the Body Mass Index (BMI) status and prevalence of obesity in nurses' current lifestyles or personal habits. Additionally, this study investigated the health-promoting a nurse's lifestyle at a tertiary hospital and determined the relationship of the health promoting lifestyle and the BMI.

## 2.0 Literature Review

### 2.1 Prevalence of obesity

Based on a literature review, Keele (2019) discovered that the prevalence of overweight and obesity varied depending on the individual's age, race and ethnicity, and country of origin. However, according to statistics, 23% and 61.4% of Americans were obese (Keele, 2019). According to Oo et al. (2019), the World Health Organization (WHO) revealed that 650 million of the 1.9 billion adults who were overweight in 2016 were obese. Furthermore, according to Oo et al. (2019), the Asia Roundtable on Food Innovation for Improved Nutrition (2016) calculated that the rising rate of obesity will cost between RM4.26 billion and RM8.53 billion. According to Chong et al. (2022), in Malaysia, a countrywide survey by National Health and Morbidity Survey (NHMS) found that the prevalence of obesity rose from 15.1% to 17.7% and then 19.9% in 2011–2015 and 2019–2020, respectively. In addition, 20.1% of Malaysian adults between 18 and 59 were obese (Chong et al., 2022).

According to Kunyahamu et al. (2021), obesity was more common among healthcare professionals in Peninsular Malaysia's east coast than in the adult population and it was significantly more prominent among nurses than doctors and other professional groups. Obesity was strongly connected with healthcare worker job categories, and various healthcare professionals appear to have varied risks; being a nurse dramatically raises the chance of being obese compared to other healthcare worker job categories (Kunyahamu et al. 2021). The primary reason was that an unhealthy diet pattern, hospital infection exposure, long working hours, and work stress were likely causes of nurse's obesity (Oo et al. 2019).

### 2.2 Health-promoting Lifestyle and obesity related to nurses and healthcare workers.

Regarding the previous study's result, the nurses aged 40 to 49 and over 50 had lower total Health-Promoting Lifestyle Profile (HPLP-II) scores than younger colleagues (Kurnat-Thoma et al. 2017). Therefore, it may be wise to equip aged and exhausted workers with resources to maintain their resilience on a personal and professional level. On the other hand, studies in Turkey show that nurses scored the highest in the subscale of Spiritual Growth regarding self-actualisation (Khaghanyrad & Ozlu 2020). Moreover, nurses scored the highest in Nutrition and Interpersonal Relationships in Health-Promoting Lifestyle Profile (HPLP-II) between nurses and the resident community. Other than that, healthcare workers adopt better Nutrition, Physical Activity and Health Responsibility than other professions (Khaghanyrad & Ozlu 2020).

A study by Baral and Tamrakar (2020) found that regarding patient care and education quality, the nurse's highest score was Spiritual Growth, which is significant by marital status and educational qualification. At the same time, Interpersonal Relationships, Nutrition, and Stress Management are significantly related to educational qualifications. Additionally, work experience affects nurses' physical activity and spiritual development (Baral et al., 2020). Gender, education, the number of people receiving care, and religion all impact the Health-Promoting Lifestyle Profile (HPLP-II) among nursing assistants in China regarding health conception, perceived health, behavioural self-efficacy, and self-satisfaction. In addition, Health-Promoting Lifestyle Profile (HPLP-II) among healthcare workers between work experience is significantly related to Physical Activity (Chen et al. 2018).

Finally, a study from Iran demonstrates the association between demographic factors, the Health-Promoting Lifestyle Profile II (HPLP-II), and Body Mass Index (BMI). However, the findings indicate no significant association between the Body Mass Index (BMI) and any of the six subscales of the HPLP-II (Hossein Abbasi & Aghamiri, 2020).

## 3.0 Methodology

Upon approval from the Medical Research Ethics Committee (MREC) from the appropriate hospital and the Human Resource Ethics Committee of UiTM Selangor, Puncak Alam Campus, a cross-sectional study was carried out at the tertiary hospital Lembah Pantai, Kuala Lumpur.

### 3.1 Instrument

This study was conducted via an online self-administered questionnaire. The instrument was adopted from the English Version of Health-Promoting Lifestyle Profile II (Walker et al., 1995) and the Malay Version of Profil Galakan-Gaya Hidup Sihat II (HPLP-II-M) (Kuan et al., 2019). The internal consistency for the total scale was 0.943, with the alpha coefficients for the subscales ranging from 0.79 to 0.87 (Walker et al., 1995). In addition, the construct reliability for the HPLP-II-M subscales was acceptable, ranging from 0.74 to 0.88 (Kuan et al., 2019). We conducted a pilot study of 33 nurses before real data collection and found that Cronbach's Alpha results for all questions ranged from 0.72 to 0.83. The sample of the pilot study was excluded from the actual data.

The questionnaire was divided into two sections; the first part consists of 11 items of socio-demographics such as age, gender, marital status, height, weight, education level, working hours, working experience, chronic disease, smoking, and alcohol. The second part consists of 6 subscales with 52 self-reporting items of HPLP-II to measure health-promoting lifestyle behaviour (Walker et al., 1995; Kuan et al., 2019). The item contained no negative questions. Four subscales consist of nine items: Nutrition, Spiritual Growth, Health Responsibility and Interpersonal Relationships, and two subscales of Stress Management and Physical Activity, each with eight items. The scoring was done using the Likert scale, with Never (1), Sometimes (2), Often (3), and Routinely (4). A higher score indicates more significance to health promotion.

### 3.2 Data Collection

The study was conducted between July 2022 to August 2022. Respondents participating in this study should be registered nurses who have worked for more than six months and must understand English and/ or Bahasa Melayu. While nursing students and nurses on special leave during the data collection period were not recruited. The respondents were approached and given an information sheet from the questionnaire's google form link posted through all nurses' registered emails. The information given included an explanation of the study and the purpose of the study being conducted.

### 3.3 Analysis

The Statistical Package for Social Sciences (SPSS) version 26.0 was used to analyse the data. In order to evaluate the reliability of the instrument, Cronbach's alpha was determined. The socio-demographic variables and the prevalence of obesity were analysed using descriptive frequency (N) and percentage (%). The method of descriptive mean, standard deviation (SD), frequencies (N) and percentages (%) were used to determine the level of health-promoting lifestyle among nurses at the tertiary hospital. In addition, inferential parametric data analysis using Pearson Correlation Coefficient Analysis determines the relationship between health-promoting lifestyle and Body Mass Index (BMI) among nurses.

## 4.0 Findings

417 respondents answered the survey, and all legitimate information was used to produce the results. Descriptive statistics have been used to determine the socio-demographic characteristic of the respondent. Most respondents were female, 92.3% (n= 385), compared to men, only 7.7% (n= 32). The mean of age was 33.22±8.04, and most respondents were from 21 to 30 years old (n= 188, 45.15%), followed by 31-40 years old (n= 157, 37.6%), 41-50 years old (n= 53, 12.7%), and more than 50 years old (n= 19, 4.6%). The educational of the respondent was Certificate/Diploma (n= 400, 95.9%), Bachelor (n= 17, 4.1%). As for the marital status, the minority of them was single (n= 122, 29.3%) and the rest married (n= 295, 70.7%). Most respondents worked hours in shifts (n= 332, 79.6%) compared to office hours (n= 85, 20.4%). On average, their working experience was 11.19±7.46 years. Approximately 379 (90.9%) respondents reported unknown chronic disease(s), while 99.3 % (n= 414) were not smoking, and 99% (413) had no alcohol use.

Table 1 shows the prevalence of obesity among nurses at the tertiary hospital using descriptive statistics. Regarding weight, group respondents were most likely to have a weight (mean) of 64.83±13.75 and a height of 157.34±5.95. Therefore, the respondent's BMI shows a mean of 26.16±5.21. Based on the WHO BMI (2000) classification, the respondents' BMI in the group underweight (less than 18.5) was 5.5% (n= 23), 22.5% (n= 94) of the respondents had normal BMI (18.5 – 22.9), 16.1% (n= 67) of the respondents were overweight (23-24.9), and 55.9% (n= 233) of the respondents were obese (≥25) (Table 2). Thus, more than half of the respondents were in the group of individuals with excessive weight.

Table 1. The prevalence of obesity among nurses

| Variable                 | Mean   | SD    | Min    | Max    |
|--------------------------|--------|-------|--------|--------|
| Weight (kg)              | 64.83  | 13.75 | 37.00  | 114.00 |
| Height (cm)              | 157.34 | 5.95  | 140.00 | 175.00 |
| BMI (kg/m <sup>2</sup> ) | 26.16  | 5.21  | 15.42  | 50.67  |

Table 2. The BMI status among nurses

| Variables     | Underweight (≤18.5) | Normal (18.5-22.9) | Overweight (23-24.9) | Obese (≥25) |
|---------------|---------------------|--------------------|----------------------|-------------|
| Frequency (n) | 23                  | 94                 | 67                   | 233         |
| Percent (%)   | 5.5                 | 22.5               | 16.1                 | 55.9        |

The Health-Promoting Lifestyle Profile II displays the six subscales of Interpersonal Relationships, Nutrition, Stress Management, Health Responsibility, Physical Activity, and Spiritual Growth. The total score of the HPLP-II was 142.46±22.70. The level of health-promoting lifestyle among nurses shows for each scale contributing to HPLP-II was Spiritual Growth (27.84±4.55), followed by Interpersonal Relationship (26.82±4.15), Nutrition (23.34±4.28), Health Responsibility (22.59±5.31), Stress Management (22.43±3.88) and the lowest mean of Physical Activity (19.45±4.54), presented in Table 3.

Table 3. Health-Promoting Lifestyle Profile II (HPLP-II) and subscale outcomes summary

| Scale dimensions           | Mean   | SD    | Min  | Max   |
|----------------------------|--------|-------|------|-------|
| Total HPLP-II              | 142.46 | 22.70 | 59.0 | 208.0 |
| Spiritual Growth           | 27.84  | 4.55  | 9    | 36    |
| Interpersonal Relationship | 26.82  | 4.15  | 11   | 36    |
| Nutrition                  | 23.34  | 4.28  | 9    | 36    |
| Health Responsibility      | 22.59  | 5.31  | 10   | 36    |
| Stress Management          | 22.43  | 3.88  | 9    | 36    |
| Physical Activity          | 19.45  | 4.54  | 8    | 32    |

Table 4 shows the correlation between the Health-Promoting Life II (HPLP-II) and Body Mass Index (BMI) using the analysis of the Pearson correlation coefficient. It shows no relationship between total HPLP-II and BMI with  $r = 0.066$  at  $p = 0.176$ . For each scale, however, only health responsibility demonstrated a small, positive connection that was statistically significant ( $r = 0.129$ ,  $p = 0.009$ ) with body mass index (BMI). Meanwhile, there was no correlation between body mass index (BMI) with Nutrition ( $r = 0.084$ ,  $p = 0.087$ ), Spiritual Growth ( $r = 0.058$ ,  $p = 0.239$ ), Interpersonal Relationship ( $r = 0.060$ ,  $p = 0.219$ ), Stress Management ( $r = 0.018$ ,  $p = 0.713$ ), and Physical Activity ( $r = -0.026$ ,  $p = 0.595$ ).

Table 4. The Pearson Correlation Analysis between the Health-Promoting Lifestyle Profile II (HPLP-II) and Body Mass Index (BMI)

|                     | Health-Promoting Lifestyle Profile II (HPLP-II) | Body Mass Index (BMI) | p-value |
|---------------------|---|-----------------------|---------|
| Pearson correlation | Total HPLP-II                                   | 0.066                 | 0.176   |
|                     | Health Responsibility                           | 0.129*                | 0.009   |
|                     | Nutrition                                       | 0.084                 | 0.087   |
|                     | Spiritual Growth                                | 0.058                 | 0.239   |
|                     | Interpersonal Relationship                      | 0.060                 | 0.219   |
|                     | Stress Management                               | 0.018                 | 0.713   |
|                     | Physical Activity                               | -0.026                | 0.595   |

\* Correlation is significant at the 0.05 level (2-tailed)

## 5.0 Discussion

The study shows that the prevalence of obesity among nurses was prevalent. According to the 2019 National Health and Morbidity Survey (NHMS), 50.1% of adults are overweight, while 30.4% are obese in Malaysia. However, the incidence of obesity and its related variables among nurses or healthcare professionals in Malaysia is undefined. As the person who provides healthcare to the community, nurses should maintain a healthy weight to serve as an excellent reference to others or the general population. According to Kyle et al. (2017), health issues potentially occur from obesity among medical practitioners. Obese individuals may develop health problems related to obesity, such as exhaustion, breathlessness, or arthritis, which could lower productivity at work. In addition, increased absenteeism and early employee departure could lower the workforce's capability. The study by Kyle et al. (2017) showed that the prevalence of obesity among nurses was 25.12% and was exceptionally high among older nurses due to the future burden of ill health. So then, basal metabolic rate (BMR) will reduce as one gets older (Omer, 2020). The high rate of obesity and overweight among public healthcare workers may be due to their intense focus on their jobs, forcing them to risk their health. Moreover, caring for numerous patients daily may limit healthcare workers' time for exercise and maintaining a healthy weight (Kit et al., 2020).

The finding of this study showed that the overall score of scale health-promoting lifestyle profile II (HPLP-II) scale was 142.46±22.70. Meanwhile, the Spiritual Growth subscale scored the highest, and the lowest was the Physical Activity. The result of this study is consistent with the finding of Estabsari et al. (2019), Keele (2019), Baral and Tamrakar (2020) and Kurnat-Thoma (2017). A study report by Baral and Tamrakar (2020) discovered that the nurses had focused more on the spiritual component of wellness and that exercise should be given more significance. According to Baral and Tamrakar (2020), the value of Spiritual Growth may be related to the trends

promoting interest in spirituality. In the current study, nurses engage in the spiritual aspect of decision-making and application while providing self-care (Estabsari et al.2019). So, the support system in the family environment also contributes to good interpersonal relationships. It demonstrates that they have high self-esteem, self-belief, a positive outlook on the future, and a sense of purpose in life, which is a reasonable projection given this type of work that requires a high level of inclusivity (Estabsari et al., 2019).

Meanwhile, Interpersonal Relationships showed the second-highest score. Respondent is most inclined to have positive relationships with those around them and care about and appreciate others for their accomplishments. It is consistent with another study which focuses on maintaining meaningful relationships in a positive working environment and giving proper recognition and management (Kurnat-Thoma et al., 2017). The Nutrition subscale had significance in this study. According to Hossein Abbasi and Aghaamiri (2020), respondents know they need to develop healthy eating habits; yet they do not frequently consume several items in the questionnaires. Based on the average mean score, respondents consume vegetables and fruits daily, a healthy eating practice. However, according to the National Health and Nutrition Examination Survey (2019), 94.9% of people do not consume the recommended five servings of fruits and vegetables daily. Therefore, Nutrition is key role in weight gain and obesity, and a healthy diet and appropriate nutrition will aid in a balanced lifestyle. Based on the result, the value of Health Responsibility showed that respondents could take responsibility for their health and seek expert advice. In addition, the study showed that respondents maintain a healthy lifestyle and are aware of the need to identify any distinctive signs and symptoms of mental health to maintain good health and provide safe and effective nursing service (Hossein Abbasi & Aghaamiri, 2020).

Furthermore, Stress Management is a crucial factor to consider. Respondents can use their strategies to handle stress but rely less on meditation for relaxation. According to Kurnat-Thoma et al. (2017), nurses' workload, working environment, organisation, and lack of proper acknowledgement have increased stress among nurses. As Keele (2019) suggested, another way to increase a health-promoting lifestyle is to promote a culture of civility and support in the workplace. Therefore, an essential health maintenance educational program is needed to address issues such as coping with stress, mindfulness, and effective communication skills. Finally, the Physical Activity subscale showed that some respondents exercise daily despite their aversion to organised exercise. Therefore, the lowest scores in Physical Activity may be attributed to circumstances such as a lack of time, facilities with inconvenient schedules, and exercise that does not fit around duty schedules. Again, it is relevant to the study by Baral and Tamrakar (2020), which showed that the lowest activity score might be attributable to a lack of time and exercise not fitting within duty schedules. Thus, nurses should constantly practice a healthy lifestyle to stay fit and healthy regardless of their working schedule (Sreevali et al., 2019).

A Pearson correlation coefficient shows no relationship between total HPLP-II and BMI. However, the subscale Health Responsibility variable showed a weakly positive connection that was statistically significant between the HPLP-II and Body Mass Index (BMI). Our results may be due to the majority of nurses working in this hospital being seniors and having an awareness of their own health responsibilities. Like Estabsari et al. (2019), this finding found a significant correlation between BMI, Health Responsibilities, and Nutritional habits. Contrary to the study by Kurnat-Thoma et al. (2017), health responsibility is the lowest, scoring HPLP-II (2.55), indicating the respondents did not always feel accountable for maintaining their well-being. According to Keele (2019), the exact questions on the subscale are asking medical professionals questions, notifying them of symptoms and signs, and bringing up health issues. As health experts, nurses have an advantage regarding comfort and knowledge.

The limitation of this study found where the respondents gave information regarding height and weight using unstandardized types of equipment. The results might be subjected to bias in regard to recall bias. In addition, the use of self-administered questionnaires as a study method may be considered a limitation of this study. Online distribution of questionnaires also presents a significant potential for data falsification, fear of being criticized, and respondents disregarding questions and responding blindly only to finish the study.

## 6.0 Conclusion and Recommendations

The current study provides a wise finding that most nurses were obese and physical activity is required to implement nurses' lifestyle-promoting behaviour to promote changes in a healthy lifestyle. Moreover, practising healthy lifestyles can help control body weight and improve stress levels. Therefore, providing stress management training courses, reducing stress in the working environment and empowering nurses to do more physical activities by providing a gym can be highlighted as priorities. As a result, nurses are expected to be role models in maintaining an ideal body weight. This study also presented essential information for Malaysian nurses, administration, and management to assume accountability for their health and well-being. Despite the limitations of related data of HPLP-II done in Malaysia, this study may benefit others, and alternative sampling methodology and comprehensive analysis can be performed in the future. In addition, larger-scale intervention at the regional, state, and national levels may be required to discover health-promoting behaviors among nurses and various interventions used to measure outcomes, which can enhance nursing research in clinical settings and other sectors.

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## Paper Contribution to Related Field of Study

This paper is related to the field of Nursing and Healthcare.

## References

- Baral, P., & Tamrakar, N. (2020). Health Promoting Lifestyle among Nurses of a Tertiary Level Hospital. *Journal of Kamali Academy of Health Sciences*, 3(1), 17. <https://doi.org/10.3126/jkaks.v3i1.28456>
- Chong, C. T., Lai, W. K., Zainuddin, A. A., Pardi, M., Mohd Sallehuddin, S., & Ganapathy, S. S. (2022). Prevalence of Obesity and Its Associated Factors Among Malaysian Adults: Finding From the National Health and Morbidity Survey 2019. *Asia-Pacific Journal of Public Health*, 1, 1–7. <https://doi.org/10.1177/10105395221129113>
- Estebarsari, F., Bakhshi, F., Nemati, S., Kazemnejad Leili, E., Ramezani, H., & Sadeghi, R. (2019). Determinants of Health Promoting Lifestyle Behaviors in Hospital Staff of Guilan University of Medical Sciences. *Health Education and Health Promotion*, 7(2), 71–76. <https://doi.org/10.29252/hehp.7.2.71>
- Hossein Abbasi, N., & Aghaamiri, M. (2020). Relationship Between Health-Promoting Lifestyle and Body Mass Index in Male Nurses Based on Demographic Variables. *American Journal of Men's Health*, 14(6). <https://doi.org/10.1177/1557988320966519>
- Institute for Public Health (IPH), National Institutes of Health, M. of H. M. (2020). National Health and Morbidity Survey 2019 : Health Literacy. In *Ministry of Health Malaysia: Vol. I* (Issue September). [shorturl.at/aAY19](http://shorturl.at/aAY19)
- Kuan, G., Kueh, Y. C., Abdullah, N., & Tai, E. L. M. (2019). Psychometric properties of the health-promoting lifestyle profile II: Cross-cultural validation of the Malay language version. *BMC Public Health*, 19(1), 1–10. <https://doi.org/10.1186/s12889-019-7109-2>
- Keele, R. (2019). To Role Model or Not? Nurses' Challenges in Promoting a Healthy Lifestyle. *Workplace Health and Safety*, 67(12), 584–591. <https://doi.org/10.1177/2165079919828738>
- Kit, L. P., Saad, H. A., Jamaluddin, R., & Phing, C. H. (2020). Prevalence of overweight and obesity among primary healthcare workers in Perak, Malaysia. *IJUM Medical Journal Malaysia*, 19(1), 23–30. <https://doi.org/10.31436/ijmj.v19i1.1327>
- Kunyahamu, M. S., Daud, A., & Jusoh, N. (2021). Obesity among healthcare workers: Which occupations are at higher risk of being obese? *International Journal of Environmental Research and Public Health*, 18(8). <https://doi.org/10.3390/ijerph18084381>
- Kurnat-Thoma, E., El-Banna, M., Oakcrum, M., & Tyroler, J. (2017). Nurses' health promoting lifestyle behaviors in a community hospital. *Applied Nursing Research*, 35, 77–81. <https://doi.org/10.1016/j.apnr.2017.02.012>
- Kyle, R. G., Wills, J., Mahoney, C., Hoyle, L., Kelly, M., & Atherton, I. M. (2017). Obesity prevalence among healthcare professionals in England: A cross sectional study using the Health Survey for England. *BMJ Open*, 7(12), 1–7. <https://doi.org/10.1136/bmjopen-2017-018498>
- Ministry of Health Malaysia. (2014). Clinical practice guidelines management of hypertension (Vol. 13). National Heart, Lung and Blood Institution. (n.d), Metabolic Syndrome. <https://www.nhlbi.nih.gov/health-topics/metabolic-syndrome>
- Oo, A. M., Al-Abed, A. A. A., Marlwin, O., Kanneppady, S. S., & Kanneppady, S. K. (2019). Prevalence of obesity and its associated risk factors among post- Basic renal care nursing students. *Malaysian Journal of Public Health Medicine*, 19(1), 177–183.
- Saad, H. A., Low, P. K., Jamaluddin, R., & Chee, H. P. (2020). Level of physical activity and its associated factors among primary healthcare workers in Perak, Malaysia. *International Journal of Environmental Research and Public Health*, 17(16), 1–12. <https://doi.org/10.3390/ijerph17165947>
- Sreevali, M., Hussin, N., Prema, M., & Cheah, W. K. (2019). Prevalence of Obesity Among Shift and Non-Shift Nurses in Taiping Hospital , Perak , Malaysia.
- Walker, S. N., Sechrist, K. R., & Pender, N. J. (1987). The Health-Promoting Lifestyle Profile: Development and psychometric characteristics. *Nursing Research*, 36(2), 76-81.
- World Health Organization. *Global Physical Activity Surveillance*; WHO: Geneva, Switzerland, 2016. Available online: <http://www.who.int/chp/steps/GPAQ/en/#> (accessed on 24 September 2016).
- Zubery, D., Kimiywe, J., & Martin, H. D. (2021). Prevalence of overweight and obesity, and its associated factors among healthcare workers, teachers, and bankers in Arusha City, Tanzania. *Diabetes, Metabolic Syndrome and Obesity: Targets and Therapy*, 14, 455–465. <https://doi.org/10.2147/DMSO.S283595>