

## ORIGINAL ARTICLE

# Association between Physical Activity and Quality of Working Life among Nurses in Private Hospitals

Yap Kar Xin<sup>1</sup>, Siti Aishah Hamzah<sup>1</sup>, Muhammad Hibatullah Romli<sup>2,3</sup>

<sup>1</sup> Department of Nursing, Faculty of Medicine and Health Sciences, Universiti Putra Malaysia, 43400 Serdang, Selangor, Malaysia.

<sup>2</sup> Department of Rehabilitation Medicine, Faculty of Medicine and Health Sciences, Universiti Putra Malaysia, 43400 Serdang, Selangor, Malaysia

<sup>3</sup> Malaysian Research Institute on Ageing, Universiti Putra Malaysia, 43400 Serdang, Selangor, Malaysia.

## ABSTRACT

**Introduction:** Nursing is a physically demanding profession; they must be in good physical condition to do the physical tasks such as lifting or positioning the patient. Studies on nurses were mostly carried out in public sectors in Malaysia and investigation among nurses in private sector is limited. Even though there are investigations on physical activity level with quality of life, however, the quality of life explored were general. Therefore, the study aims to determine the association between physical activity (PA) and quality of working life (QoWL) among nurses working in private hospitals. **Methods:** This is a cross-sectional study. The nurses were recruited by using the snowball sampling method during the COVID-19 pandemic. This study involved 64 nurses (61 female and three male) in private hospitals. Using Google Form, sociodemographic data, physical activity (PA), and quality of the working life (QoWL) were gathered online and analysed using SPSS version 22. PA was evaluated using the Global Physical Activity Questionnaire (GPAQ), whereas QoWL was measured for the Work-Related Quality of Life Scale (WRQoL). Spearman Correlation, the Mann-Whitney Test, and the Kruskal-Wallis Test were applied to determine PA and QoWL. **Results:** According to the findings, the WRQoL score and age had a significant correlation ( $p < 0.05$ ). The PA was also shown to have a significant on two of the six elements of the WRQoL scale, which represent the control at work and stress at work. The association between physical activity and general well-being also was found significant ( $p < 0.05$ ). **Conclusion:** This study identified private nurses in Malaysia were physically active and having relatively good quality of working life. The factors such as increase of age among nurses contributes to lower quality of work life. Malaysian Journal of Medicine and Health Sciences (2024) 20(3): 158-164. doi:10.47836/mjmhs.20.3.22

**Keywords:** Nurses, physical activity, quality of working life, job satisfaction.

## Corresponding Author:

Siti Aishah Binti Hamzah, MScNurs  
Email: aishahs.hamzah@upm.edu.my  
Tel: +6019-330 9751

## INTRODUCTION

Nurses is considered the backbone professions in the healthcare industry. Nursing is a physical-demand job which requires the nurses to be fit to carry out the physical tasks such as prolong standing, carrying and lifting heavy things, and fast-paced mobility (1). Having a good and quality patient care relies on the nurse's performance in their job and this includes the nurses' quality of life, job satisfaction as well as the nurses' health and wellbeing (2,3). However, many Malaysian nurses having poor health and wellbeing quality in terms of physical fitness and activity. Study shows many nurses were physically inactive, abnormal bodyweight of either underweight or overweight, having musculoskeletal diseases such as back and neck pain, and having unhealthy lifestyle such

as high stress and unhealthy diet (3-6). The previous-mentioned problem contributes towards continuous issue on physical inactivity for the nurses. Persons who active physically was found to have better physical and psychological performance as well as good quality of life and wellbeing and this can be achieved by remain active in doing daily life activities such as doing exercises, doing house chores and leisure activities, use less of sedentary and supportive technology (e.g., motorized transportation), while in the same time taking care of own body not to be excessive in doing things, get a good rest and respecting the pain (7).

Most nurses are classified as highly and moderately active. However, a large percentage of their reported PA attributed to occupational PA, indicating a larger physical work-stress predisposing them to participate in less leisure time PA (8). Even though there are investigations on physical activity level with quality of life, however, the quality of life explored were general. Most quality of life aspects investigated are on health-related quality

of life such as by using the SF-36 form or the World Health Organization's aspect on quality of life using the WHOQOL-Bref instrument which observed on physical health, psychological health, social relationship and environmental health (9). This is inaccurately depicting the quality of life specific on the working condition. The general quality of life can be denoted from personal life experience and the experience in personal life may or may not translated into working life (10). For example, a person can be happy with his or her personal life and family relationship but feels stress with the work and job demand. Therefore, it is important to investigate specifically on working context to get a better picture on the impact.

In Malaysia, studies on nurses mostly were conducted in public sectors. Nurses in the public sectors mostly reported with poor working quality such as overburden, high level of stress and having poor quality of life and physically inactive (11). Investigation among nurses in private sector is limited while the population of nurses in private sectors usually experience a unique attention than the one in public sector. For example, nurses working in private sector also experience an unhealthy working condition, and higher level of marginalization, discrimination, and abuses (12). Similarly with healthcare workers in public sector, those in private sector also experience high work burden, and out of job scope demands (13-16). Nurses in private are also reported lack in training and low work retention (17). However, this population of nurse is under researched and neglected which makes the knowledge and intervention for them limited.

Therefore, the impact of different factors, such as physical activity, on quality of working life is of interest. Thus, the researcher aims to examine the association between physical activity (PA) and quality of working life (QoWL) among nurses working in private hospitals. This study will analyse the relationship between sociodemographic data, PA and QoWL through breaking into details of level of PA and subscales of Work-Related Quality of Life Scale (WRQoL).

## **MATERIALS AND METHODS**

### **Design**

This was a cross-sectional research using questionnaires carried out from April to August using the snow ball technique sampling among nurses in private hospitals. Data collection was performed online. The study received ethical clearance from the UPM Ethics Committee for Research Involving Human Subjects (Ref. No.: UPM/TNCPI/RMC/JKEUPM/1.4.18.2 (JKEUPM)).

### **Setting and recruitment**

The population of this study were registered nurses working in private hospitals regardless of academic qualification. The inclusion criteria was registered nurses

who have worked for over six months and the exclusion criteria were nurses who were in probation period, on maternal leave, study leave, long sick leave, pregnant, administrative staff and clinical instructors. There are 38 private hospitals in Selangor (18). Selangor is among the state with a large volume of private hospitals and contain a large size hospital. As Selangor is highly populous and developed state in Malaysia, the work load of those in private hospitals is also distinct than the other location. Thus, one private hospital in Selangor, Malaysia is considered for this study.

### **Sample size estimation**

The reported statistic during the year 2018 showed that the total number of nurses in the private sector in Selangor was 4844 (19). Estimation of the sample size is calculated based on the number of nurses in one private hospital known by the researcher as conveniently selected. Together with margin of acceptable error 10%, confidence level 95% and response distribution 50%, the calculated minimum sample size for this study is 55 respondents.

However, due to the pandemic and movement restriction order, limited ability to effectively approaching the potential respondents, and low response rate due to the busy and high work demand of the healthcare practitioners, the recruitment is done using snowball method and open to any nurses working in private hospitals throughout Malaysia.

### **Questionnaires**

The questionnaires comprised of sociodemographic information, the Global Physical Activity Questionnaire (GPAQ), and the Work-Related Quality of Life Scale (WRQoL). GPAQ was used to assess the degree of PA, whereas WRQoL was used to measure the quality of life. GPAQ is a self-administered questionnaire evaluates the level of physical activity (20). GPAQ consists of 16 questions to collect information from three domains which are activity at work, travel to and from places and recreational activities, together with sedentary behavior. The frequency which will be measured in days per week and the duration which will be 14 measured in time per day are collected accordingly for each domain. METs (Metabolic Equivalent) are used for the analysis of GPAQ data, 4 METs get assigned to the time spent in moderate activities, and 8 METs to the time spent in vigorous activities. The higher the total MET value (minutes per week), the more active the individual is. GPAQ has been evaluated for its validity internationally (21).

WRQoL is a 23-item self-administered tool to assess specific on quality of working life (22). There are 6 factors assessed including general well-being, home-work interface, job and career satisfaction, control at work working condition and stress at work. Each item is responded on a 5-point scale comprising of 1 = Strongly

Disagree, and 5 = Strongly Agree. The scores of the three negatively phrased items are reversed (questions 7, 9, 19). After coding (including reversal of the three negatively phrased items), the overall WRQoL factor score is determined by finding the average of all 23 WRQoL items. The higher overall WRQoL score indicates better quality of working life.

### Data Collection

Data was collected fully online using Google Forms through snowball sampling to increase the number of participations during the pandemic crisis. Link of the Google Form questionnaire was sent to nurses working in the private hospitals in Malaysia, acquaintance to the researcher, through social media such as Facebook and WhatsApp. The link was then shared with other eligible nurses. The first page of the online questionnaire survey was denoted in providing complete participant information to ensure they met the inclusion and exclusion criterias and consented to participate in the study. Researchers can access the answers from participants for research purposes only.

### Data Analysis

Data was analysed using the SPSS version 22 and non-parametric tests, Mann-Whitney Test, Kruskal-Wallis Test and Spearman Correlation, were used as the data were not normally distributed (Kolmogorov-Smirnov normality test result of 0.000 and a p-value 0.000).

## RESULTS

### Socio-demography

A total of 72 individuals responded to the online survey, and only 64 responses were valid to be used and analysed in this study. Table I shows the demographic characteristics of respondents. Majority of the participants in this research were female (n=61, 95.3%). Their median age was 26 years old (range: 21 – 49 years old), their median years of working were 2 (range: 0.5 – 26 years), most of them were from the medical ward (n=19, 29.7%), and most of them worked shifts (n=61, 95.3%). The median weekly energy expenditure was 3,360 MET minutes (range: 200 – 19,200 MET minutes). Moreover, half of the individuals (n=34, 53.1%) were classed as having a high level of physical activity. The median WRQoL score was 81.50 (range: 31 – 110).

### Association between sociodemographic data and Physical Activity (PA)

Overall energy expenditure of PA was used as a parameter. Data on sociodemographic and energy expenditure were found to have no significant association (Table II).

### Association between sociodemographic data and Work-Related Quality of Life (WRQoL)

From the Spearman's analysis, a weak but significant negative association was discovered between WRQoL score and age ( $\rho = -0.264$ ,  $p = 0.035$ ). No other

**Table I: Sociodemographic data of nurses working in private hospitals**

Variables	n (%)	median (min-max)
<b>Age</b>		26 (21-49)
<b>Gender</b>		
Female	61 (95.3)	
Male	3 (4.7)	
<b>Years of working</b>		2.0 (0.5-26.0)
<b>Current wards or units of working</b>		
Obstetrics and gynaecology unit	11 (17.2)	
Multidisciplinary unit	10 (15.6)	
Critical unit	8 (12.5)	
Paediatric ward	3 (4.7)	
Surgical-related unit	13 (20.3)	
Medical ward	19 (29.7)	
<b>Shift working</b>		
No	3 (4.7)	
Yes	61 (95.3)	
<b>Overall energy expenditure</b>		3360 (200-19200)
High PA	34 (53.1)	
Moderate PA	19 (29.7)	
Low PA	11 (17.2)	
<b>Overall WRQoL score</b>		81.50 (31-110)

**Table II: Association between sociodemographic data and overall energy expenditure**

Variables	Overall energy expenditure	
	median (min-max)/ mean rank	p-value
<b>Age</b>	$\rho = 0.142$	$p = 0.263^a$
<b>Gender</b>		$p = 0.131^b$
Female	3160 (200-19200)	
Male	5920 (3840-12000)	
<b>Years of working</b>	$\rho = 0.065$	$p = 0.610^a$
<b>Current wards or units of working</b>		$p = 0.211^c$
Obstetrics and gynaecology unit	22.00	
Multidisciplinary unit	27.55	
Critical unit	47.50	
Paediatric ward	43.00	
Surgical-related unit	33.77	
Medical ward	35.29	
<b>Shift working</b>		$p = 0.455^b$
No	6720 (1680-6720)	
Yes	3360 (200-19200)	

Notes: a= Spearman correlation, b= Mann-Whitney test, c=Kruskal-Wallis test.

significant association was found as reported in Table III.

**Association between PA and QoWL**

Table IV shows that there was no significant association between total WRQoL score and overall energy expenditure. Alternative analysis was performed where the total amount of energy used was further categorized into PA levels but no association was found with WRQoL score (Table V).

**Table III: Association between sociodemographic data and overall Work-Related Quality of Life (WRQoL)**

Variables	Overall WRQoL score	
	median (min-max)/ mean rank	p-value
<b>Age</b>	rho= -0.264	p= 0.035**
<b>Gender</b>		p= 0.198 <sup>b</sup>
Female	82.00 (31-110)	
Male	71.00 (47-84)	
<b>Years of working</b>	rho= -0.177	p= 0.163 <sup>a</sup>
<b>Current wards or units of working</b>		p= 0.400 <sup>c</sup>
Obstetrics and gynaecology unit	38.68	
Multidisciplinary unit	39.05	
Critical unit	35.94	
Paediatric ward	31.00	
Surgical-related unit	26.00	
Medical ward	28.71	
<b>Shift working</b>		p= 0.259 <sup>b</sup>
No	84.00 (83-90)	
Yes	80.00 (31-110)	

Notes: a= Spearman correlation, b= Mann-Whitney test, c=Kruskal-Wallis test, \*= p-value <0.05.

**Association between level of PA and subscales of WRQoL**

The WRQoL Scale was further categorized into 6 WRQoL subscales, which are General Well-Being (GWB), Home-Work Interface (HWI), Job and Career Satisfaction (JCS), Control at Work (CAW), Working Conditions (WCS) and Stress at Work (SAW). Table VI indicates there were significant association found between level of PA and CAW (X<sup>2</sup>=7.512, p=0.023), as well as level of PA and SAW (X<sup>2</sup>=6.292, p=0.043). The significant between level of PA and GWB was also found with to be clinically relevant with a p-value of less than 0.1 (X<sup>2</sup>=5.075, p=0.079).

**Table VI: Association between level of PA and subscales WRQoL**

Variables	GWB			HWI			JCS			CAW			WCS			SAW		
	Mean rank	X <sup>2</sup>	p-value	Mean rank	X <sup>2</sup>	p-value	Mean rank	X <sup>2</sup>	p-value	Mean rank	X <sup>2</sup>	p-value	Mean rank	X <sup>2</sup>	p-value	Mean rank	X <sup>2</sup>	p-value
Level of PA		5.075	0.079**		2.438	0.296 <sup>a</sup>		2.686	0.261 <sup>a</sup>		7.512	0.023**		4.130	0.127 <sup>a</sup>		6.292	0.043**
High PA	36.21			33.21			35.40			36.43			36.25			27.78		
Moderate PA	32.08			35.61			31.66			33.24			30.92			34.97		
Low PA	21.77			24.95			25.00			19.09			23.64			42.82		

Notes: a= Kruskal-Wallis test, \* = p-value <0.05, \*\* = p-value <0.1.

**Table IV: Association between overall energy expenditure and overall WRQoL score**

Variables	Overall WRQoL score	
	median (min - max)	p-value
<b>Overall energy expenditure</b>	rho= 0.148	p= 0.243 <sup>a</sup>

Note: a= Spearman correlation.

**Table V: Association between level of PA and overall WRQoL score**

Variables	Overall WRQoL score	
	mean rank	p-value
<b>Level of PA</b>		p= 0.225 <sup>a</sup>
High PA	34.63	
Moderate PA	33.76	
Low PA	23.73	

Note: a= Kruskal-Wallis test.

**DISCUSSION**

This study identified private nurses in Malaysia were physically active and having relatively good quality of working life. It reflected to a study in five (5) Malaysian government hospitals found that 50.1% of the nurses had moderate QoWL (23). The similar study which shows that private hospital nurses had a high quality of work life than public sector nurses where was conducted among 218 nurses who worked in both government and private hospitals in Peshawar, Pakistan (24).

Demographic factor like age and physical activity have association with quality of working life. However, physical activity has impacted in certain quality of work life on control at work, stress at work and general well-being. Increase of age among nurses contributes to lower quality of work life. There are several assumptions of such aspect. Experienced nurses will have more responsibility than just basic clinical duty such as getting advanced training, supervising junior staff and holding management position (25). In addition, majority of the nurses are women and over time, their family expanded and also has a role as wife and mother (26). This makes the nurses juggling between work and personal life which creates higher burden, less time for family leave, childcare facilities are not available at the workplace, and an imbalance between work life and family demands (27) contributed to low quality of life among senior nurses. In Malaysia, as in many other countries, there is a scarcity of nurses (28), making it more difficult for nurses to take time off to care for their

families. Increase age makes a person prone to health problems such as musculoskeletal injury, arthritis, and other chronic conditions such as hypertension and diabetes (29,30). Having chronic conditions was found reduces quality of life (31). Hence, this may explain of the association between age and quality of working life.

Physical activity such as exercising has been linked to better time management, mental-interpersonal performance, and production expectations (32). This supported the current study finding where physical activity can foster better ability of the nurses to control their work. Additionally, data from a cross-sectional investigation of health care professionals indicated that more excellent PA was related to a decrease in reporting of poor or mediocre job capacity (33). This is because physically active person is usually more motivated to improve one's self image and physical feature, more organized in their lifestyle and this attitude is also perhaps translated into their work life. This current study found higher physical activity provides a better stress management at work. This result is supported by previous review where physical activity and exercise contributes to better mental health such as reducing stress, depression, anxiety and burnout as well as improve self-esteem, confidence and self-control (34). Exercise and other PA yield endorphins, a type of chemical in the brain that acts as natural painkiller and promote better sleep, which in turn decreases stress (35). This may explain of that physical activity could reduce the workplace stress. In addition, this current study found physical activity can improve general well-being among the nurses. Physical activity has been found to be a factor in a person's overall sense of well-being, both physically and psychologically (36). Physical activity improves and contributes to better health condition such as better management of chronic health conditions such as high blood pressure, cardiovascular health, glucose level, cholesterol level, metabolic syndrome and obesity (37,38). Another study revealed that PA had a good influence on employee well-being, which was backed up by the outcomes of that study (39).

The study is constrained by several limitations. Firstly, the utilization of snowball sampling due to the Covid-19 pandemic resulted in a small sample size, which may limit the generalizability of the findings. Additionally, reliance on respondents to recall their physical activity over the past 7 days introduces potential recall bias, possibly impacting the accuracy of reported data. Furthermore, the absence of data regarding nurses' working hospitals, initially intended for universal sampling at a single hospital before the pandemic, limits the contextual understanding of the study's results, overlooking potential variations in hospital environments and policies. These limitations necessitate careful interpretation of the findings and point towards avenues for future research to address these constraints for a more robust understanding of the topic.

## CONCLUSION

Age is the factor that is related to the nurses' quality of life at work in private hospitals, according to the findings. It was discovered that there was a significant correlation between the level of physical activity and control and stress at work from the two components of the Work-Related Quality of Life (WRQoL) scale.

## ACKNOWLEDGEMENTS

Authors are thankful to all respondents for giving their valuable time.

## REFERENCES

1. Chunhui, He., Kermit, G., Davis. Impact of Shift Work on Physical and Postural Demands Among Nursing Aides in Long-Term Health Care Facilities. *Proceedings of the Human Factors and Ergonomics Society Annual Meeting*, 2011;55(1): 1007-1011. doi:10.1177/1071181311551210
2. Otaghi M, Azadi A, Sayehmiri K, Nikeghbal N. Relationship between Mental Health, Life Satisfaction, and Job Satisfaction of Nurses. *Romanian Journal of Military Medicine*, 2023; 126(2):185-191. doi:10.55453/rjmm.2023.126.2.9
3. Dor A, Halperin O. Nurses' Job Satisfaction and Motivation: Patients' and Nurses' Perceptions. *The journal of bioscience and medicine*, 2022; 10(6):121-131. doi: 10.4236/jbm.2022.106011
4. D'Errico A, Viotti S, Baratti A, Mottura B, Barocelli AP, Tagna M, et al. Low back pain and associated presenteeism among hospital nursing staff. *Journal of Occupational Health*, 2013; 55(4):276-83. doi:10.1539/joh.12-0261-0a
5. Saridi M, Filippopoulou T, Tzitzikos G, Sarafis P, Souliotis K, Karakatsani D. Correlating physical activity and quality of life of healthcare workers. *BMC Research Notes*, 2019;12(1):208. doi:10.1186/s13104-019-4240-1
6. Cambridge Dictionary. Quality of Working Life | meaning in the Cambridge English Dictionary; 2019. Retrieved from <https://dictionary.cambridge.org/dictionary/english/quality-of-working-life> on Dec 2019.
7. Lim ZL, Danaee M, Jaafar Z. The association between physical activity and work schedule among hospital nurses: A cross-sectional study. *Malaysian Journal of Movement, Health & Exercise*, 2019; 8(1):15-32. doi:10.15282/mohe.v8i1.254
8. World Health Organization. Physical activity; (2018). Retrieved from <https://www.who.int/news-room/fact-sheets/detail/physical-activity> on Dec 2019
9. Easton S, Van Laar D. User Manual for the Work-Related Quality of Life (WRQoL) Scale: A Measure of Quality of Working Life. 2nd ed. University of Portsmouth, 2018. doi: 10.17029/EASTON2018

10. Van Laar D, Edwards JA, Easton S. The Work-Related Quality of Life scale for healthcare workers. *Journal of Advanced Nursing*, 2007; 60(3):325–333. doi:10.1111/j.1365-2648.2007.04409.x
11. Abdullah NK, Rashid RS, Lukman N, Yusof YH, Annuar MN. Quality of Working Life among Nurses at a General Hospital in Malaysia. 1st Economics and Business International Conference 2017, 2018;46:338-345. doi:10.2991/ebic-17.2018.52
12. Suleiman K, Hijazi Z, Kalaldehy MA, Sharour LA. Quality of nursing work life and related factors among emergency nurses in Jordan. *Journal of Occupational Health*, 2019;61(5):398-406. doi:10.1002/1348-9585.12068
13. Ab Rahman N, Husin M, Dahian K, et al. Job satisfaction of public and private primary care physicians in Malaysia: analysis of findings from QUALICO-PC. *Hum Resour Health*, 2019; 17:82. doi:10.1186/s12960-019-0410-4
14. Ahmed S, Abd Manaf N H, Islam R. Measuring quality performance between public and private hospitals in Malaysia. *International Journal of Quality and Service Sciences*, 2017; 9(2):218–228. doi:10.1108/ijqss-02-2017-0015
15. Ong SM, Lim MT, Fah Tong S, Kamaliah MN, Groenewegen P, Sivasampu S Comparative performance of public and private primary care service delivery in Malaysia: An analysis of findings from QUALICOPC. *PloS ONE*, 2022; 17(10):e0276480. doi:10.1371/journal.pone.0276480
16. Jawahir S, Mohamad Anuar NN, Sheikh Abdullah SF, Silvernayagam S, Tan EH. Perception of nurses on the practice environment: experience from Malaysia. *Med J Malaysia*. 2021;76(1):73-79. Retrieved from: <https://www.e-mjm.org/2021/v76n1/perception-of-nurses.pdf>
17. Sheshadri T, Aranganathan P. Nurses in private hospitals in bangalore - a study on retention (1st ed.). 2023. Jupiter Publications Consortium. doi: 10.47715/jpc.b.978-93-91303-54-9
18. Association of Private Hospital of Malaysia. Member hospitals. (2019) . Retrieved from <https://hospitals-malaysia.org/member-hospitals/> on Dec 2019.
19. Suleiman K, Hijazi Z, Kalaldehy MA, Sharour LA. Quality of nursing work life and related factors among emergency nurses in Jordan. *Journal of Occupational Health*, 2019; 61(5):398-406. doi:10.1002/1348-9585.12068
20. World Health Organization: WHO STEPS Surveillance Manual: the WHO STEPwise Approach to Chronic Disease Risk Factor Surveillance. 2005, Geneva, Switzerland: World Health Organization
21. Bull FC, Maslin TS, Armstrong T. Global physical activity questionnaire (GPAQ): nine country reliability and validity study. *Journal of physical activity & health*, 2009; 6(6):790–804. doi:10.1123/jpah.6.6.790
22. Easton S, Van Laar D. User Manual for the Work-Related Quality of Life (WRQoL) Scale: A Measure of Quality of Working Life. (2nd ed.) University of Portsmouth. 2018. doi:10.17029/EASTON2018
23. Sham F, Alias A. Quality of Work Life among Nurses in Malaysia Government Hospital. *Environment-Behaviour Proceedings Journal*, 2023; 8(24):323-329 doi: 10.21834/ebpj.v8i24.4690
24. Saeeda Akbar, Sobia yasmin, Ayaz Ayub et al. Quality of Nurses Work Life among Public and Private Sector Tertiary Care Hospitals of Peshawar (A Comparative Study), 04 January 2023, PREPRINT (Version 1) available at Research Square (<https://doi.org/10.21203/rs.3.rs-2310531/v1>)
25. Thomas JM. Creating Roles to Retain the Experienced Mature Nurse in the Post-Anesthesia Care Unit. *Perioperative Nursing Clinics*, 2007; 2(4):337-344. doi: 10.1016/J.CPEN.2007.08.003
26. Muriel, Moyo. Millennial Nurse Manager: Leading Staff Nurses More Experienced Than You. *Nurse Leader*, 2019; 17(3):253-256. doi: 10.1016/J.MNL.2018.09.005
27. Suleiman K, Hijazi Z, Kalaldehy MA, Sharour LA. Quality of nursing work life and related factors among emergency nurses in Jordan. *Journal of Occupational Health*, 2019;61(5):398-406. doi:10.1002/1348-9585.12068
28. Atefi N, Abdullah KL, Wong LP. Job satisfaction of Malaysian registered nurses: A qualitative study. *Nursing in Critical Care*, 2014;21(1):8-17. doi:10.1111/nicc.12100
29. Spann SJ, Ottinger MA. Longevity, Metabolic Disease, and Community Health. *Prog Mol Biol Transl Sci*. 2018;155:1-9. doi: 10.1016/bs.pmbts.2017.11.015.
30. Gianini R, Salvestro G. Common mental disorders and circulatory diseases associated prevalence: age related differences from a health survey analysis: common mental disorders and circulatory diseases. *BJHMR (Internet)*. 2022;9(1):153-65. doi:10.14738/jbemi.91.11873
31. Moola S, Tyagi J, Kakoti M, Patel A, Bhaumik S. Tools to assess quality of life in adults with chronic conditions in India: A scoping review. *WHO South East Asia J Public Health*. 2022;11(2):102-127. doi: 10.4103/WHO-SEAJPH.WHO-SEAJPH\_151\_21.
32. Coulson J, Mckenna J, Field M. Exercising at work and self-reported work performance. *International Journal of Workplace Health Management*. 2008;1(3):176-97. doi:10.1108/17538350810926534
33. Arvidson E, Börjesson M, Ahlborg G Jr, Lindegerd A, Jonsdottir IH. The level of leisure time physical activity is associated with work ability-a cross sectional and prospective study of health care workers. *BMC Public Health*. 2013;13:855. doi: 10.1186/1471-2458-13-855.
34. Singh B, Olds T, Curtis R, Dumuid D, Virgara R, Watson A, Szeto K, O'Connor E, Ferguson

- T, Eglitis E, Miatke A, Simpson CE, Maher C. Effectiveness of physical activity interventions for improving depression, anxiety and distress: an overview of systematic reviews. *Br J Sports Med.* 2023 Sep;57(18):1203-1209. doi: 10.1136/bjsports-2022-106195.
35. Farris SG, Abrantes AM. Mental health benefits from lifestyle physical activity interventions: A systematic review. *Bull Menninger Clin.* 2020;84(4):337-372. doi: 10.1521/bumc.2020.84.4.337.
  36. Rodríguez-Fernández A, Ramos-Díaz E, Zuazagoitia-Rey-Baltar A. Quality of Life and Physical Activity: Their Relationship with Physical and Psychological Well-Being (Internet). London: IntechOpen; 2017 (cited 2020 Sep). Available from: <https://www.intechopen.com/chapters/55530>
  37. Buecker S, Simacek T, Ingwersen B, Terwiel S, Simonsmeier BA. Physical activity and subjective well-being in healthy individuals: a meta-analytic review. *Health Psychology Review.* 2021;15(4):574-592, doi:10.1080/17437199.2020.1760728
  38. Warburton DER, Bredin SSD. Health benefits of physical activity: a systematic review of current systematic reviews. *Current Opinion in Cardiology.* 2017;32(5):541-556. doi: 10.1097/HCO.0000000000000437
  39. Brown HE, Gilson ND, Burton NW, Brown WJ. Does Physical Activity Impact on Presenteeism and Other Indicators of Workplace Well-Being? *Sports Medicine.* (2011). 41(3):249-262. doi:10.2165/11539180-000000000-00000