

## Basic Research

### The Relationship between Nurses Fatigue and their Work Engagement in School Settings at Alexandria

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#### Abstract

**Context:** School health nurses have a pivotal role in the provision of health care services to students. Therefore, they are experiencing more fatigue and stress with the increasing numbers of students who enroll in school with either acute or chronic health conditions where they require early detection and management during the school day. **Aim:** Assess the relationship between school health nurses' fatigue and their work engagement in school settings in Alexandria. **Subjects:** 200 school health nurses who represent available school nurses enrolled in all educational zones of Alexandria **Methods:** A descriptive correlational research design was adopted to carry out this study. **Research question:** What is the relationship between school health nurses fatigue and their work engagement in school settings at Alexandria?. **Tools:** Tool I: which includes two parts: Part One: The Socio-demographic characteristics of school health nurses and Part Two: Professional Quality of Life Scale Version 5 (ProQOL5). Tool II: The 9-Utrecht Work Engagement Scale (UWES). **Results:** The results of this study showed that more than three quarters (78.0%) of the studied nurses had moderate vigor toward their work and the highest percent of them had moderate dedication and absorption (84.0 & 91.0%) respectively. Also, there were statistically significant differences between the school health nurses' fatigue and mean scores of work engagement. **Conclusion:** The study concluded that school health nurses at more risk of being victims of the long-term stress they are suffering overwhelming needs of ill students and their families, which in turn lead to compassion fatigue and burnout. So, studying the relationships between school health nurses' fatigue and their work engagement plays an important role in health promotion of students and all school health personnel. **Recommendations:** Prevention of school health nurses' fatigue should be incorporated in nursing theory and education to improve their levels of work engagement and decrease secondary traumatic stress.

**Keywords:** School health nurse, Compassion fatigue, Work engagement.

## **1. Introduction:**

School health nurses have a pivotal role in the provision of health care services to students. There are numerous factors that contribute to more fatigue and stress among healthcare providers as well as school health nurses, including heavy workloads, fulltime, a high pace, lack of physical or psychological safety, chronicity of care, moral conflicts, perceived job security, and workplace related bullying or lack of social support. Burnout, depression, anxiety, sleeping difficulties, and other illnesses might occur from the associated psychological anguish (**Søvold et al., 2021**).

School settings represent the second most influential environment in our children' life after own homes. As more students enter school as their emotional and social wellbeing is just as important as physical health. Good mental health helps them develop the resilience to cope with whatever life throws at them and grow into well-rounded, healthy adults (**MHF., 2022**). So, the school health nurse is one of the most crucial health care representatives in school settings. They are serving as one of the caregiver's members in introducing the preventive services, early detection of any health problems, interventions, and referrals to available community resources (**AAP., 2016**).

However, the World Health Organization (WHO) declared that schools are one of the most consistent and appropriate settings to address students' health and welfare (**WHO, 2019**). A Growing body of evidence pointed out that the complex ways in which health and education are so connected, it becomes obvious that the optimal role of school health nurses goes well beyond dealing with mild or severe cases appeared among students. School nurses perform an important role within the school settings by addressing the major health problems experienced by the students. This role includes providing preventive, curative and screening services, health education and assistance with decision-making about health, and immunization against preventable diseases (**NASN., 2016**).

Population health is the foundation of school nursing. The duty of the school nurse is frequently seen as providing sporadic care to specific individuals, and more lately, highly competent care to students who are medically fragile and chronically unwell (**Bergren., 2017**). Meanwhile, a growing body of evidences supports the fact that, most school health nurses enter the field of nursing care with the intent to help others and provide empathetic care for patients either the students or school personnel with the critical health condition. Those nurses became victims of the long-term stress they are suffering overwhelming needs of ill students and their families, which in turn lead to compassion fatigue. Compassion fatigue affects not only the school health nurse in terms of job satisfaction, emotional and physical health but also the workplace by decreasing productivity, and increasing turnover (**Moudatsou et al., 2020**)

Nowadays, nurses are under extreme stress as they try to operate in healthcare systems that are already overcrowded due to complex demands. The incapacity to provide effective care for others may occur, which could cause compassion fatigue, burnout, and a rise in the number of people quitting their career. The concept of compassion fatigue has drawn a lot of attention in recent years as the difficulties of working in the health professions have come to light. Attempts to manage the complicated needs of a stressed-out healthcare system put a tremendous amount of strain on people

responsible for providing services. This lack of ability to nurture can have particularly serious ramifications for nurses, who have a crucial responsibility to give compassionate care through the most trying times of health and disease (Nolte A et al., 2017).

According to Willgerodt., (2018), a recent national workforce study revealed that 121,300 school nurses (86,800 full-time employees) are in public schools across the nation. While, less than one-fifth (18.1%) of school administrations don't have any paid-for school nurse at all and many others have only a part-time school nurse. Even full-time school nurses may not spend all their time in one school. Additionally, more than half (55.9%) of school nurses cover more than two schools within the same day. However, adverse job characteristics—high workload, low staffing levels, long shifts, low schedule flexibility, time pressure, low task variety, role conflict, low autonomy and low control—are associated with nurses' fatigue and burnout (Dall'Ora et al., 2020).

Unfortunately, students who are medically fragile or who have chronic disease are coming to school in increasing numbers and with increasingly complex medical problems that require urgent nursing intervention and treatment, which can be demonstrated by the school nurse. Chronic conditions such as bronchial asthma, anaphylaxis, type 1 and type 2 diabetes, epilepsy, obesity, rheumatic fever, and mental health concerns may hinder the students' ability to be in school settings and ready to learn (ANA., 2017).

Therefore, the National Association of School Nurses (NASN) approved that each school should have a full-time nurse with a baccalaureate degree in nursing. A nurse who serves a single school full time is better able to establish a strong relationship with students, school personnel and their community, which in turn enhances the nurse's decision and clinical judgment (ANA, 2017). Moreover, school nurse burnout is a widespread phenomenon that is characterized by a decline in nurses' energy that shows up as emotional tiredness, a loss of enthusiasm, and emotions of frustration and may lower work efficacy (Mudalla R et al., 2017). Furthermore, studying the relationships between school health nurses' fatigue and their work engagement plays an important role on determining the factors that hinder school nurses' role and their feeling of responsibility toward own students. Additionally, enhance and promote nurses' satisfaction and increasing their productivity.

## **2. Significance of the Study:**

The study seeks to assess the relationships between school health nurses' fatigue and their work engagement; as such problem is considered a growing public problem. It has not only physical, cognitive, mental, and political, but also economic impact (less work, less production and very high costs). Therefore, school health nurses who exposed to burnout and experienced more stress are more likely to provide unsafe care, have increased intentions to leave their employment, experience increased depersonalization, and report low job satisfaction (Nolte A et al., 2017).

**3. Aim of the Study:** the current study aims to assess the relationship between school health nurses' fatigue and their work engagement in school settings.

## **4. Research question:**

- What is the relationship between school health nurses fatigue and their work engagement in school settings at Alexandria?

## **5. Subjects and Methods**

**5.1. Research Design:** A descriptive correlational research design was utilized to fulfill the aim of the present study.

**5.2. Setting:** The study settings were selected using a multistage random sampling technique. Accordingly, the study was carried out at the governmental schools representing the eight educational zones in Alexandria Governorate that target Urban, Suburban and Rural communities.

### **5.3. Sampling technique:**

- Using the equal allocation method, a convenient sample of 200 nurses was selected from each of the previously mentioned settings. The total sample size was 1000 students.

**5.3. Subjects:** The subject of this study comprised 200 school health nurses who represent all available school health nurses in each school settings during the academic year (2019-2020); Alexandria Governorate is divided into eight educational zones affiliated to the Ministry of Education namely; El Montazah, East, West, Middle, El Agami, El Amria, El Gomrok and Borg El Arab.

## **6. Tools:**

**6.1. Tool I: School Health Nurses' Socio-demographic Characteristics and Professional Quality of Life Scale Version 5 (ProQOL5):** It consisted of two parts as follows;

**Part I: School health nurses' Socio-demographic characteristics:** This part was developed by the researchers to obtain baseline data as; age, sex, marital status, level of education, years of experiences and working shifts.

### **Part II: Professional Quality of Life Scale Version 5 (ProQOL5):**

This tool was developed by (Stamm., 2010). It was adopted by the researchers to assess the compassion fatigue. It consists of 30 items divided into 3 subscales, each one composed of 10 items that evaluate three distinct phenomena: Compassion Satisfaction, Burnout and Secondary Traumatic stress. The instrument 5-point Likert-type scale ranging from 1 = never to 5 = very often. Compassion fatigue results from high burnout and high secondary traumatic stress. This scale was chosen because it is currently considered one of the most used tool to evaluate compassion fatigue, being interesting for researchers since it includes the positive component – compassion satisfaction – and not only the negative components (Stamm., 2010)

**6. 2. Tool II: The 9-Utrecht Work Engagement Scale (UWES):** This tool developed by (Zhang., 2018) and adopted by the researchers. It includes 9-items scale that measures 3 dimensions of work engagement—vigor (3 items), dedication (3 items), and absorption (3 items)—uses a 7-point Likert scale ranging from never to always. Higher scores indicate higher levels of engagement.

## **6.3. Method:**

- First, an approval from the Ethical Research Committee, Faculty of Nursing, and Alexandria University was obtained.
  - Second, an official letter from the Faculty of Nursing was directed to the Directorate of Education in Alexandria to obtain their approval to carry out the study after complete explanation of the study aim.
  - Directors of the schools were met to explain the purpose of the study and the time for starting in order to facilitate data collection.
  - Tools' Validity and reliability: All tools were submitted to five experts in the field of Community Health Nursing and Nursing Administration for content and validity. The necessary modifications were incorporated accordingly.
- Reliability of the tools was asserted by using Cronbach's Alpha coefficient test. The internal consistency reliability result was 0.754 for tool I part I and 0.668 for tool II.
- A **pilot study** was initially carried out prior to the actual data collection phase on 10% of the sample size to check clarity, feasibility and applicability of tools, as well as identifying obstacles that may be encountered during the data collection process, and to determine the time needed to fill in the assessment tools, accordingly, the required modifications were done.
  - Data was collected by the researchers during the period from the beginning of October 2019 and ended by February 2020.

#### **6.4. Ethical considerations:**

- A written informed consent from school health nurses to participate in the study was obtained before data collection and after explanation of the aim of the study.
- Privacy of the study participants was asserted.
- Confidentiality of the collected data was assured.
- Participants' voluntary participation and their right to withdraw from the study at any time were emphasized.

#### **6.7. Statistical Analysis:**

Data were processed and analyzed using PC with statistical package for social science (SPSS ver. 20); Cronbach's alpha reliability test was used to measure the reliability of all tools. Its maximum value is ( $\alpha=1.0$ ) and the minimum accepted value is ( $\alpha= 0.7$ ); below this level the tool would be unreliable. Numbers and percentages from total were used to describe and summarize the demographic data. Comparisons were carried out using **Chi-Square ( $\chi^2$ )**, ANOVA test, Student T Test and Pearson correlation Coefficient and the level of significance decided for this study was P equal to or less than 0.05.

#### **7. Results**

**Table (1):** This table showed that within the demographic data, slightly more than two fifths (41.5%) of them were among the age group of 30 to 40 years old, and more than two thirds (69.0%) of them were married. Also, slightly less than two fifths (39.5%) of the studied nurses had

secondary school of nursing diploma, while more than one quarter (29%) of them had from 10 to 15 years of experiences. In addition, the vast majority (98.5%) of them worked full time.

**Figure (1):** This figure displayed that more than three quarters (78.0%) of the studied nurses had moderate vigor toward their work and the highest percent of them had moderate dedication and absorption (84.0 & 91.0% ), respectively.

**Table (2):** This table illustrated that the mean scores of nurses' vigor, dedication and absorption toward their work engagement were ( $10.88 \pm 2.678$ ,  $9.470 \pm 2.585$ ,  $9.250 \pm 2.009$ ), respectively with total mean percentage score (47.0%).

**Table (3):** Portrayed that the vast majority (97.6%) of nurses who were among the age group of 30 to 40 years old have moderate level of work engagement, followed by those who were married (94.9%). Also, all the studied participants (100%) who have technical institute diploma, bachelor and master degree as well as those who have 5 to 10 years of experiences and those who were working for part time have moderate levels of work engagement. Moreover, a statistical significant difference was found between level of work engagement and school health nurses' years of experiences where  $P=0.008^*$ . While no significant difference was observed between the levels of work engagements of the studied sample and their age, marital status, educational level and the working shifts where  $P=0.180$ ,  $P=0.580$ ,  $P=0.178$  &  $P=0.939$ , respectively.

**Table (4):** illustrated that the school health nurses whose age ranged from 20 - 30 years old, those who were single, those who have technical institute diploma, those who have years of experiences less than 5 years and part time working have the highest mean score of work engagement ( $30.51 \pm 5.453$ ,  $30.05 \pm 4.370$ ,  $30.48 \pm 4.622$ ,  $31.87 \pm 6.034$  &  $30.00 \pm 4.583$ ), respectively. However, no a statistically significant difference was observed between school health nurses' mean score of work engagement and their age, marital status, years of experiences and working shifts ( $P=0.489$ ,  $P=0.768$ ,  $P=0.138$  &  $P=0.895$ ), respectively. A highly significant difference detected between mean score of work engagement and school health nurses' educational level ( $P=0.002^*$ ).

**Table (5):** revealed that more than half of the studied sample had moderate level of compassion satisfaction and burnout (61.0% & 60.5%, respectively). While, high level of secondary traumatic stress was reported by 64.5% of them. Also, slightly more than half of nurses (51.5%) had moderate level of fatigue.

**Figure (2):** showed that the total mean scores of fatigue for the studied sample was  $108.73 \pm 6.456$  with mean percentage score of 72.49%.

**Table (6):** revealed that no significant difference was found between the school health nurses' levels of fatigue and their age, marital status, educational levels, years of experiences and working shifts where ( $P=0.542$ ,  $P=0.288$ ,  $P=0.186$ ,  $P=0.540$  &  $P=0.596$ ), respectively.

**Table (7):** displayed that there was an elevation in the mean and standard deviations among those whose age group ranged from 20 - 30 years, single, have Technical Institute Diploma and had from 5-10 years of experience, as well as those who were working a full time ( $110.97 \pm 4.732$ ,  $109.54 \pm 4.858$ ,  $111.57 \pm 4.925$ ,  $109.78 \pm 4.219$ ,  $108.74 \pm 6.492$ ), respectively. Moreover, there were

statistically significant differences between the school health nurses' fatigue mean scores and their age and years of experience where  $P=0.050$  &  $P=0.020$ , respectively.

**Table (8):** portrayed that, there were statistically significant differences between the school health nurses' fatigue mean scores and their work engagement where  $P=0.008$ .

**Table (9):** showed that there were statistically significant negative correlation between total nurses' fatigue and total nurses' engagement where ( $P= 0.013$ ). Also, there were statistically significant negative correlation between the school health nurses' burnout and vigor, didication, and total engagement where ( $P=0.009, 0.020, 0.012$ ) respectively. Moreover, there were statistically significant negative correlation between the school health nurses' stress and vigor where ( $P= 0.048$ ).

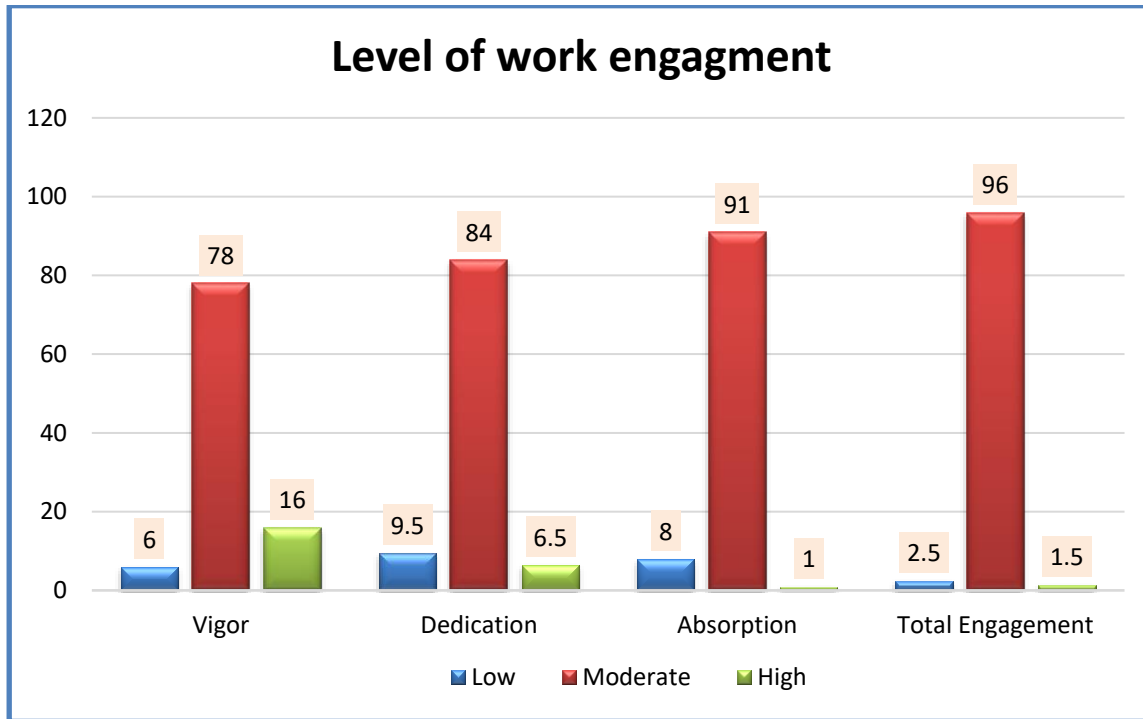
**Table (10):** demonstrated that there were a highly statistically significant positive correlations between the school health nurses' total work engagement and its dimensions; vigor, dedication and absorption where  $P=0.000$ .

**Table (11):** denoted that there were a statistically significant negative correlation between the school health nurses' feeling of stress and satisfaction where ( $P=0.006^*$ ). Also, there were a highly significant positive correlation between the school health nurses' feeling of stress and burnout where ( $P=0.000^*$ ). Moreover, there were a highly statistically significant negative correlation between the school health nurses' fatigue and their satisfaction where ( $P=0.000^*$ ). On the other hand, there were a highly statistically significant positive correlations between the school health nurses' fatigue and burnout, and stress where ( $P=0.000^*$ ).

**Table (1): Distribution of School Health Nurses according to their Socio-demographic Characteristics**

Nurses' Characteristics	Total N=200	
	No.	%
<b>Age (in years):</b>		
▪ 20-	39	19.5
▪ 30-	83	41.5
▪ 40-50	78	39.0
<b>Marital Status:</b>		
▪ Single.	41	20.5
▪ Married.	138	69.0
▪ Divorced/ Widowed.	21	10.5
<b>Educational Level:</b>		
▪ Secondary School of Nursing diploma.	79	39.5
▪ Technical Institute of Nursing diploma.	21	10.5
▪ Bachelor Degree.	50	25.0
▪ Master Degree.	27	13.5
▪ Doctorate Degree.	23	11.5
<b>Years of Experience:</b>		
▪ <5	15	7.5
▪ 5-	54	27.0
▪ 10-	58	29.0
▪ 15-	40	20.0
▪ ≥20	33	16.5
<b>Working Shift:</b>		
▪ Full Time.	197	98.5
▪ Part Time.	3	1.5

**Figure (1): Frequency Distribution of School Health Nurses according to their Levels of Work Engagement**



**Table (2): Distribution of Nurses according to their Total Work Engagement Mean Scores**

Items	Mean Scores		Mean Percentage Score
	Min-Max	Mean ± SD	
• Vigor.	0-15	10.88 ± 2.678	51.81%
• Dedication.	0-17	9.470 ± 2.585	45.09%
• Absorption.	0-17	9.250 ± 2.009	44.05%
• Total Work Engagement	0-43	29.59 ± 5.329	47.00%



**Table (3): The Relationship between the School Health Nurses' Work Engagement Levels and their Socio-demographic Characteristics**

Items	Levels of Work Engagement						Total (N= 200)		Test of Significant
	Low (N= 5)		Moderate (N= 192)		High (N= 3)		No.	%	
	No.	%	No.	%	No.	%			
<b>Age (in years):</b>									
• 20-30	0	0.0	37	94.9	2	5.1	39	19.5	X <sup>2</sup> =6.273 P=0.180
• 30- 40	2	2.4	81	97.6	0	0.0	83	41.5	
• 40-50	3	3.8	74	94.9	1	1.3	78	39.0	
<b>Marital Status:</b>									
• Single.	0	0.0	40	97.6	1	2.4	41	20.5	X <sup>2</sup> =2.867 P=0.580
• Married.	5	3.6	131	94.9	2	1.4	138	69.0	
• Divorced/ Widowed.	0	0.0	21	100.0	0	0.0	21	10.5	
<b>Educational Level:</b>									
• Secondary School Diploma.	3	3.8	73	92.4	3	3.8	79	39.5	X <sup>2</sup> =11.431 P=0.178
• Technical Institute Diploma.	0	0.0	21	100.0	0	0.0	21	10.5	
• Bachelor Degree.	0	0.0	50	100.0	0	0.0	50	25.0	
• Master Degree.	0	0.0	27	100.0	0	0.0	27	13.5	
• Doctorate Degree	2	8.7	21	91.3	0	0.0	23	11.5	
<b>Years of Experience:</b>									
• <5	0	0.0	13	86.7	2	13.3	15	7.5	X <sup>2</sup> =20.732 P=0.008*
• 5-	0	0.0	54	100.0	0	0.0	54	27.0	
• 10-	2	3.4	56	96.6	0	0.0	58	29.0	
• 15-	1	2.5	39	97.5	0	0.0	40	20.0	
• ≥20	2	6.1	30	90.9	1	3.0	33	16.5	
<b>Working Shift:</b>									
• Full Time	5	2.5	189	95.9	3	1.5	197	98.5	X <sup>2</sup> =0.127 P=0.939
• Part Time	0	0.0	3	100.0	0	0.0	3	1.5	

X2 Chi square test

\* statistically significant at  $\leq 0.05$

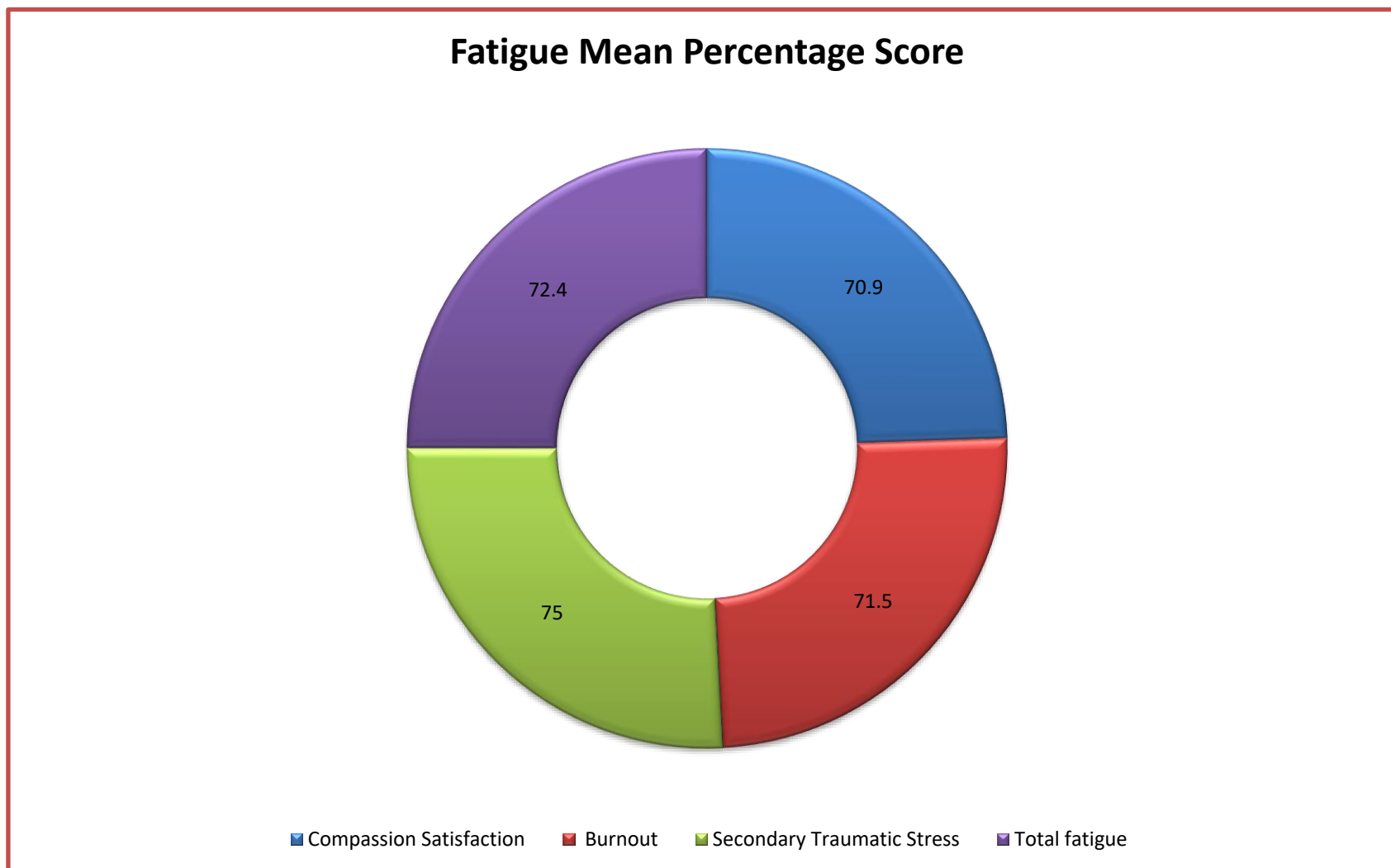
**Table (4): The Relationship between School Health Nurses' Work Engagement Mean Scores and their Socio-demographic Characteristics**

Items	Mean Score of Work Engagement	Test of Significance
	Mean $\pm$ S. D	
<b>Age (in years):</b>		
▪ 20-30	30.51 $\pm$ 5.453	F=0.718
▪ 30-40	29.35 $\pm$ 5.758	P=0.489
▪ 40-50	29.40 $\pm$ 4.782	
<b>Marital Status:</b>		
▪ Single.	30.05 $\pm$ 4.370	F=0.264
▪ Married.	29.54 $\pm$ 5.711	P=0.768
▪ Divorced/ Widowed.	29.05 $\pm$ 4.489	
<b>Educational Level:</b>		
▪ Secondary School Diploma.	30.28 $\pm$ 4.873	F=4.428
▪ Technical Institute Diploma.	30.48 $\pm$ 4.622	P=0.002*
▪ Bachelor Degree.	30.06 $\pm$ 4.934	
▪ Master Degree	29.63 $\pm$ 4.700	
▪ Doctorate Degree	25.39 $\pm$ 7.178	
<b>Years of Experience:</b>		
▪ <5	31.87 $\pm$ 6.034	F=1.761
▪ 5-	30.56 $\pm$ 5.079	P=0.138
▪ 10-	28.59 $\pm$ 5.795	
▪ 15-	29.15 $\pm$ 4.555	
▪ $\geq$ 20	29.30 $\pm$ 5.163	
<b>Working Shift:</b>		
▪ Full Time.	29.59 $\pm$ 5.349	t=0.018
▪ Part Time.	30.00 $\pm$ 4.583	P=0.895

F ANOVA test    t Student T Test    \* Statistically significant at  $\leq 0.05$

**Table (5): Distribution of the School Health Nurses according to their Levels of fatigue.**

Items	Total N=200	
	No.	%
<b>Compassion Satisfaction:</b>		
▪ Low.	0	0.0
▪ Moderate.	122	61.0
▪ High.	78	39.0
<b>Burnout:</b>		
▪ Low.	1	0.5
▪ Moderate.	121	60.5
▪ High.	78	39.0
<b>Secondary Traumatic Stress:</b>		
▪ Low.	1	0.5
▪ Moderate.	70	35.0
▪ High.	129	64.5
<b>Total Fatigue level:</b>		
▪ Low.	0	0.0
▪ Moderate.	103	51.5
▪ High.	97	48.5

**Figure (2): Distribution of the School Health Nurses according to their total mean scores of fatigue**

**Table (6): The Relationship between School Health Nurses' Levels of fatigue and their Socio-demographic Characteristics.**

Items	Levels of nurses' fatigue				Total (N= 200)		Test of Significant
	Moderate (N= 103)		High (N= 97)		No.	%	
	No.	%	No.	%			
<b>Age (in years):</b>							
▪ 20-	17	43.6	22	56.4	39	19.5	X <sup>2</sup> =1.225 P=0.542
▪ 30-	44	53.0	39	47.0	83	41.5	
▪ 40-50	42	53.8	36	46.2	78	39.0	
<b>Marital Status:</b>							
▪ Single.	25	61.0	16	39.0	41	20.5	X <sup>2</sup> =2.487 P=0.288
▪ Married.	66	47.8	72	52.2	138	69.0	
▪ Divorced/ Widowed.	12	57.1	9	42.9	21	10.5	
<b>Educational Level:</b>							
▪ Secondary School Diploma.	42	53.2	37	46.8	79	39.5	X <sup>2</sup> =6.177 P=0.186
▪ Technical Institute Diploma.	6	28.6	15	71.4	21	10.5	
▪ Bachelor Degree.	27	54.0	23	46.0	50	25.0	
▪ Master Degree.	17	63.0	10	37.0	27	13.5	
▪ Doctorate Degree.	11	47.8	12	52.2	23	11.5	
<b>Years of Experience:</b>							
▪ <5	6	40.0	9	60.0	15	7.5	X <sup>2</sup> =3.110 P=0.540
▪ 5-	26	48.1	28	51.9	54	27.0	
▪ 10-	35	60.3	23	39.7	58	29.0	
▪ 15-	19	47.5	21	52.5	40	20.0	
▪ ≥20	17	51.5	16	48.5	33	16.5	
<b>Working Shift:</b>							
▪ Full Time.	101	51.3	96	48.7	197	98.5	X <sup>2</sup> =0.280 P=0.596
▪ Part Time.	2	66.7	1	33.3	3	1.5	

X<sup>2</sup> Chi square test \* statistically significant at  $\leq 0.05$

**Table (7): The Relationship between School Health Nurses' Fatigue Mean Scores and their Socio-demographic Characteristics**

Items	Mean Score of nurses' fatigue	Test of Significance
	Mean ± S. D	
<b>Age (in years):</b>		
▪ 20-	110.97±4.732	F=3.037
▪ 30-	108.05±6.529	P=0.050*
▪ 40-50	108.32±6.931	
<b>Marital Status:</b>		
▪ Single.	109.54±4.858	F=0.417
▪ Married.	108.49±7.033	P=0.660
▪ Divorced/ Widowed.	108.71±5.188	
<b>Educational Level:</b>		
▪ Secondary School Diploma.	107.91±7.331	F=1.535
▪ Technical Institute Diploma.	111.57±4.925	P=0.194
▪ Bachelor Degree.	109.30±4.808	
▪ Master Degree.	108.04±5.251	
▪ Doctorate Degree.	108.48±8.295	
<b>Years of Experience:</b>		
▪ <5	112.80±6.155	F=2.986
▪ 5-	109.78±4.219	P=0.020*
▪ 10-	107.29±7.221	
▪ 15-	107.63±7.482	
▪ ≥20	109.00±6.088	
<b>Working Shift:</b>		
▪ Full Time.	108.74±6.492	t=0.081
▪ Part Time.	107.67±3.786	P=0.776

F ANOVA test    t Student T Test    \* Statistically significant at  $\leq 0.05$

**Table (8): The Relationship between School Health Nurses' Fatigue and their Work Engagement**

Items	Levels of nurses' fatigue				Total (N= 200)		Test of Significant
	Moderate (N= 103)		High (N= 97)		No.	%	
	No.	%	No.	%			
<b>Work Engagement:</b>							
▪ Low.	1	50.0	1	50.0	5	2.5	X <sup>2</sup> =0.067 P=0.967
▪ Moderate.	76	52.1	70	47.9	192	96.0	
▪ High.	26	50.0	26	50.0	3	1.5	
	<b>Mean Score of nurses' fatigue</b>						
<b>Work Engagement:</b>							
▪ Low.	95.50±27.577						F=4.936 P=0.008*
▪ Moderate.	108.58±6.480						
▪ High.	109.63±4.533						

X<sup>2</sup> Chi square test    F ANOVA test    \* Statistically significant at ≤ 0.0

**Table (9): Correlation Matrix between School Health Nurses' Mean Scores of Work Engagement and their fatigue**

Items		Vigor	Dedication	Absorption	Total Engagement
Satisfaction	r	0.136	0.028	0.004	0.053
	p	0.055	0.699	0.952	0.453
Burnout	r	-0.185	-0.164	-0.013	-0.178
	p	0.009*1	0.020*	0.859	0.012*
Stress	r	-0.140	-0.109	-0.018	-0.130
	p	0.048*	0.124	0.803	0.066
Total Fatigue	r	-0.220	-0.123	-0.014	-0.175
	p	0.002*	0.084	0.847	0.013*

R Pearson correlation Coefficient    \* Statistically significant at ≤ 0.05

**Table (10): Correlation Matrix between School Health Nurses' Mean Scores of Dimensions of Work Engagement**

		<b>Vigor</b>	<b>Dedication</b>	<b>Absorption</b>	<b>Total Engagement</b>
<b>Vigor</b>	r				
	p				
<b>Dedication</b>	r	0.457			
	p	0.000*			
<b>Absorption</b>	r	0.129	0.269		
	p	0.069	0.000*		
<b>Total Engagement</b>	r	0.773	0.816	0.572	
	p	0.000*	0.000*	0.000*	

R Pearson correlation Coefficient \* statistically significant at  $\leq 0.05$



**Table (11): Correlation Matrix between the School Health Nurses' Mean Scores of Dimensions of fatigue**

		Satisfaction	Burnout	Stress	Total Fatigue
<b>Satisfaction</b>	r				
	p				
<b>Burnout</b>	r	-0.085			
	p	0.230			
<b>Stress</b>	r	-0.195	0.336		
	p	0.006*	0.000*		
<b>Total Fatigue</b>	r	-0.583	0.671	0.796	
	p	0.000*	0.000*	0.000*	

R Pearson correlation Coefficient \* Statistically significant at  $\leq 0.05$

## 8. Discussion

School nurses usually working alone in the school settings and are often the only individual with health-related skills to deal with cases that arise during the school day (**Davis, 2018**). So, their occupational safety, physical, social and mental well-being are the main concern that getting of worldwide attention, due to emotional demands of their task and the importance they have on the productivity, competitiveness and sustainability of the educational sector (**Giménez-Espert et al., 2019**). Globally, the alarming increases of fatigue during daily work among health care professional especially nurses both reflect and contribute to international tensions as: rapid changes in political alignment, reduced family and community cohesiveness, increased unemployment and underemployment, economic, social marginalization as well as increased turnover (**WHO., 2019**).

Indeed, recent findings suggest that nurses begin their professional careers with high levels of work engagement and commitment, which provide them many strategies and solutions to deal with stressful events (**Todaro-Franceschi., 2019**). Although nurses' fatigue has been discussed in a myriad of literature sources and highlights the need for ongoing research to further understand the nature of fatigue and its impact on quality of daily life. But, few studies have researched the impact of fatigue on school health nurses within the school settings. Therefore, this study is distinguished and one of the pioneers in this area of research. It helps to shed the light on the importance of one of the most serious problem in our community and to assist the concerned authority to find out a solution. Hence, this study was conducted with the aim of identifying the relationship between school health nurses' fatigue and their work engagement in school settings in Alexandria. Furthermore, the present study plays an important role in identifying the factors that lead to fatigue among school health nurses.

The study findings revealed that fatigue was unexpectedly more prevalent among school health nurses as more than two fifths (41.5%) of them were among the age group of 30 to 40 years old. This finding may be attributed to the small number of school health nurses who are distributed on large number of school settings as on nurse for more than 8 schools. This result is in harmony with the findings of **Aslan et al., (2021)** who found that the average age of nurses was  $33.6 \pm 6.7$  years and their duration of work in the profession was  $6.7 \pm 3.4$  years. Further support added by (**Borges et al., 2019**) who found that more than half (59%) of the studied nurses aged 36 or over.

Marital status is considered one of multidimensional factor, one of which leads to fatigue and at the same time leads to support. This is in agreement with the results of the current study where more than two thirds (69.0%) of the study sample were married. This is in congruent with **Mayasari et al., 2017** who found that (86.36%) of the studied participants were married.

There is an overwhelming weight of evidence stressed the fact that nurses' fatigue is a multifactorial problem. Years of experience is among this factors that play important role in how person can feel stress and fatigue or not. Results of the present study shed light on more than one

quarter (29%) of them had 10 - 15 years of experiences. Contradicting studies were varied as **Jameson & Bowen., (2018)** found that the highest percentage of school nurses who had 16–20 years of experience represent 25.3%.

Findings of the present study assured that, working hours is another contributing factor for school nurses' fatigue, where the vast majority (98.5%) of the studied nurses worked full time. This is in agreement with the **Aslan et al., (2021)**, who revealed that four fifths (81.2%) of the sample worked mixed day and night. Contradicting result also reported by **Borges et al., (2019)** who found that 97.7% of the studied participants worked rotating shifts.

However, multiple studies have used secondary traumatic stress and compassion fatigue interchangeably and have investigated the association between compassion fatigue and burnout in emergency department nurses and trauma nurses (**Wijdenes et al., 2019; Lee et al., 2021**). Meanwhile, (**Johnson K., 2017**) indicated that the educational level had a major impact on how school health nurses could feel work tiredness, in addition to the methods that used in dealing with such issue. Similarly, findings of the current study showed that slightly less than two fifths (39.5%) of the studied nurses had secondary school of nursing diploma. This was in contrast with **Jameson et al., (2018)** who found that all studied participants had a baccalaureate degree or higher as the minimum educational preparation requirement for practicing as school nurses.

Workplace burnout has been conceived in terms of inadequacy, tiredness, and cynicism at work and frequently characterizes nurses' reactions to persistent occupational stress. Job burnout is linked to high levels of psychological, social, physical, and school setting demands, whereas work engagement is linked to psychological, social, physical, and organizational resources (**Salmela-Aro et al., 2019**). Work engagement is considered a measuring tool of a person well-being, where it is defined as a vigor or level of energy, the extent of absorption and the amount of dedication that applied to the work setting. This result was in contrast with the results of the current study where the highest percent of school health nurses reported moderate level of vigor, dedication and absorption toward their work (78.0%, 84.0, 91.5% ), respectively. Additionally, the mean work engagement level of the current study was  $29.59 \pm 5.329$ . This may be due to; work demands and workload, time pressure, long working hours and also interpersonal conflicts among nurses. This result is sustained by **Ziapour & Kianipour., (2015)**, they also showed that absorption held the highest mean score (Mean=5.41, SD=0.76) and vigor held the smallest average amount (Mean=5.04, SD=0.86). Where, the average and standard deviation of nurses' staff engagement were 5.23 and 0.48, respectively.

Furthermore, the current study illustrated the highest mean score of work engagement among school health nurses with a statistically significant difference between mean score of work engagement and school health nurses' educational level ( $P=0.002^*$ ). These findings was in congruence with the studies of **Remegio et al., (2020)**, who studied the professional quality of life

and work engagement of nurse leaders, which revealed that nurses' work engagement levels were above the average.

However, no significant difference was observed between the levels of work engagements of school health nurses and their age, marital status, educational level and the working shifts. This probably stems from the fact that (as stated in the literature) nurses engaged in their work dedicated more of their time to their profession and patients. Contradicting results illustrated by **Diab & El-Nagar., (2019)**, who found that all demographic characteristics of their studied subjects and its relationship with work engagement level were a highly statistically significant, except marital statuses p-value equal (0.581) was not significant.

This finding was matched with **Hegazy et al., (2021)**, who concluded the positive work environment could significantly improve organizational outcomes and identifying factors, which influence the positive environment, may reduce turnover intention and increase work engagement among nurses. Work-related burnout (WRB) is a different work-related stress syndrome portrayed by dimensions; emotional exhaustion, professional inefficacy and cynicism (**Lubbadeh T., 2020**). The performance of school nurses is influenced by many factors, which are divided into three according to their perspectives: individual (work stress), situation (workload), and regulations (supervision). These factors contribute to work burnout such as: workload, decreasing staff levels, demanding workload acuity, inability to accomplish job tasks and inability to renew oneself both emotionally and physically (**Saputera & Suhermin., 2020**). Previous research regarding burnout in hospitals revealed that positive work environments increase job satisfaction, decrease staff turnover and improve work outcomes. However, few studies address burnout among school health nurses (**Jameson & Bowen., 2018**). This study provides insights into the domains of work that can cause burnout among school nurses and provides evidence that can inform school leadership and policy makers on ways to promote healthy work environments.

Regarding the nurses' fatigue levels, the present study portrayed that, slightly more than three fifths of the studied participants have moderate level of compassion satisfaction and burnout (61.0% & 60.5%, respectively). While, high level of secondary traumatic stress was reported by 64.5% of them. This may be related to many reasons first, regulations policy and constrains such as; supervision, salary, medical services, financial and non-financial rewards. Other reasons include; motivation workloads, facilities, cooperation between professions, and work environment. In this context, (**Tao et al, 2018**) reported that that the more work stress that is felt by employees, the job satisfaction of employees will decrease and vice versa. This study also is in agreement with the study by (**Lee et al, 2021**), who found numerous variables that affect nurse performance, such as organizational culture, leadership, incentives, work motivation, promotion and opportunities. Additionally, educational attainment was strongly related to levels of compassion satisfaction, burnout, and secondary traumatic stress. In this regard **Dewedar et al., (2022)**, stated that nurses with a bachelor's or master's degree in nursing report feeling less worn out and more satisfied with their ability to help others.

Moreover, there were statistically significant differences between the mean scores of school health nurses' fatigue and their age and years of experiences where ( $P=0.050$  &  $P=0.020$ ), respectively. On a similar trend, nurses with more than 20 years of experience in leadership and management have higher compassion satisfaction and lower burnout and secondary traumatic stress compared with nurses with less than 5 years of experience.

Finding of the present study is consistent with **Aslan et al., (2021)**, who reported that compassion fatigue is increasing when the age and working time of nurse increases and they found a positive correlation between age/ duration of work in the profession and compassion fatigue, and that the difference between them was statistically significant ( $p < 0.05$ ).

All in all, the obtained results have put in evidence that higher levels of compassion fatigue were common among younger school health nurses with fewer years of nursing experience. However, fatigue is considered one of the biggest occupational health problems, posing a serious threat in school health nurses' work engagement and quality of life when it is not immediately addressed.

## **9. Conclusion:**

The current study investigated the relationship between school health nurses' fatigue and their work engagement in school settings. The current study findings concluded that, the three dimensions of work engagement; vigor, dedication and absorption held moderate means among school health nurses. Meanwhile, more than half of nurses have moderate level of compassion satisfaction, burnout and high level of secondary traumatic stress. Accordingly, identifying risk factors for school nurses burnout is important. Even those nurses who report to be engaged, but simultaneously also exhausted, may have a risk to develop burnout. School administration commitment, directly influenced by the individuals' personality traits, deemed the biggest human resources in school influencing the level of services provided to all school personnel especially students.

## **10. Recommendation:**

Based on the current study findings, it is recommended that the school 'nurses' personality traits are given acute consideration by the school administrators in the event of recruitment and appointment of the workforce. Moreover, prevention of school health nurses' fatigue should be incorporated in nursing theory and clinical education to improve the levels of work engagement and decrease secondary traumatic stress. The school administrators consider using digital technology and other innovative techniques to guarantee that school health nurses have access to effective training and ongoing support and guidance.

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## الملخص العربي

### العلاقة بين إجهاد الممرضات وانخراطهن في العمل في الوسط المدرسي في الإسكندرية

**المقدمة:** تلعب ممرضات الصحة المدرسية دورًا محوريًا في تقديم خدمات الرعاية الصحية للطلاب. لذلك فهن يعانون المزيد من الإجهاد مع تزايد أعداد الطلاب الذين يلتحقون بالمدرسة سواء كانوا يعانون من حالات صحية حادة أو مزمنة والتي تتطلب التدخل المبكر والإدارة خلال اليوم الدراسي.

**الهدف من الدراسة:** معرفة العلاقة بين إجهاد ممرضات الصحة المدرسية وانخراطهن في العمل في الوسط المدرسي بالإسكندرية

**سؤال البحث:** ما هي العلاقة بين إجهاد ممرضات الصحة المدرسية وانخراطهن في العمل في الوسط المدرسي بالإسكندرية؟

**منهجية البحث:** تم استخدام تصميم بحثي وصفي ارتباطي لعينة ملائمة مكونة 200 ممرضه صحة مدرسية يمثلون جميع ممرضات الصحة المدرسية المتواجدين بجميع المناطق التعليمية بالإسكندرية

تم استخدام أداتان لتجميع البيانات من ممرضات الصحة المدرسية:

**الأداة الأولى:** وتتضمن جزأين: الجزء الأول: إستبيان مقابلة لجمع بيانات عن الخصائص الاجتماعية والديموغرافية لممرضات الصحة المدرسية، الجزء الثاني: مقياس جودة الحياة المهنية ، الإصدار 5 (ProQOL5)

**الأداة الثانية:** مقياس ارتباط العمل (UWES-9) .

**النتائج:** لقد أظهرت نتائج هذه الدراسة أن أكثر من ثلاثة أرباع (78.0%) من الممرضات الخاضعات للدراسة كانت لديهن نشاطًا معتدلاً تجاه عملهن وأن أعلى نسبة تفاني واستيعاب (84.0 و 91.0%) على التوالي كانت معتدلة. كما أسفرت نتائج البحث عن وجود فروق ذات دلالة إحصائية بين إجهاد ممرضات الصحة المدرسية ومتوسط درجات المشاركة في العمل.

**الخلاصة:** أن ممرضات الصحة المدرسية أكثر عرضة لخطر الوقوع ضحية للضغوط طويلة الأمد ، فهم يعانون من احتياجات هائلة للطلاب المرضى وعائلاتهم ، مما يؤدي بدوره إلى إجهاد التعاطف والإرهاق. لذا فإن دراسة العلاقة بين إجهاد ممرضات الصحة المدرسية وانخراطهم في العمل يلعب دورًا مهمًا في تعزيز صحة الطلاب وجميع العاملين بالمدرسة.

**التوصيات:** لذلك يجب دمج الوقاية من إجهاد ممرضات الصحة المدرسية في نظرية التمريض والتعليم لتحسين مستوى مشاركتهن في العمل وتقليل الإجهاد الثانوي الناتج عن الضغوط.