

Nursing Staff's Change Fatigue, Psychological Resilience, and Job Satisfaction at Mansoura University Hospital

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Abstract

Background: Change fatigue is an overwhelming emotion of stress, tiredness, and burnout caused by feelings of ambivalence and impotence in the workplace. In addition to personal stress, change fatigue may negatively affect nurses' job satisfaction and psychological resilience and increased the turnover of nurses. **Aim:** Explore the relationship between change fatigue, psychological resilience, and job satisfaction of nursing staff at Mansoura university hospital.

Subjects& Methods: a correlation descriptive design was applied, and conducted among 187 nursing staff working at Mansoura University Hospitals. Data were collected from nursing staff by using three tools online via Google form: (a) Change Fatigue scale, (b) Connor-Davidson Resilience scale, and (c) McCloskey/Mueller Satisfaction Scale. **Results:** reveals that there is a correlation between change fatigue, job satisfaction, and psychological resilience. Change fatigue had a statistically significant negative correlated with psychological resilience. There is a statistically significant positive correlation was present between sub-scales of job satisfaction and staff nurses' place of work, nurses who had diplomas, and those aged more than 45 years. A statistically significant difference was present between staff nurses' who work at (Urology center), nurses' experience (6-10 years), and psychological resilience domain. **Conclusion:** Nursing Staff's offered important insight into the effect of change fatigue on their psychological resilience and job satisfaction. Nursing staff are negatively influenced by change fatigue and positively influenced by resilience. **Recommendations:** This work was recommended that using measures to reduce change fatigue in nursing staff, which can improve nurse job satisfaction and workplace conditions. Offering psychological resilience training programs and a comprehensive approach to change fatigue management may counter-act these negative effects of change fatigue.

Key words: Nurses, Psychological Resilience, Change fatigue, job satisfaction

Introduction

Change fatigue has been broadly defined as overwhelming feelings of stress, exhaustion, and burnout fueled by emotions of ambivalence and inadequacy in the job (Allan et al., 2014; McMillan & Perron, 2013a). Change fatigue may drive nurses to withdraw and has a significant impact on their choice to quit the job and even their profession (Bernerth et al., 2011; Brown et al., 2018a). Interestingly, the concept of change fatigue supplies more knowledge beyond that of change resistance. Although it

wasn't widely discussed in the context of health care, particularly in nursing.

Current changes in the health care system include nursing practice, allocation of human resources, and technological advancements (McMillan & Perron, 2013b). Continuous changes in the hospital have become a normal feature of the nursing work environment (Verhaeghe et al., 2006). The effects of these changes and the way nursing staff cope with them are being overlooked and little explored (Delmatoff et al., 2014; McMillan & Perron, 2013b). Organizational changes have a negative impact on both the

physical and psychological well-being of nursing staff with a heightened frequent perceived negative outcome on organization too (**Bernerth et al., 2011**). Change fatigue causes a decrease in job satisfaction (**Rafferty & Griffin, 2006; Teo et al., 2013**).

The negative consequences of change fatigue might have a significant influence on the nursing profession, which is especially important in health-care systems experiencing unprecedented rates of change. The health-care system requires healthy satisfied nurses to work properly (**Cimiotti et al., 2012; McHugh et al., 2011; Shanafelt et al., 2018**).

Psychological Resilience is a process that allows individuals to access resources to cope with and recover from difficulty (**Jackson et al., 2007**). And it can be learned; the more experience and success in stress regulation that a nurse has, the more he or she is equipped to deal with future stressors, (**McDonald et al., 2013**). Psychological resilience is developed through experience and used to cope with stressful situations (**Gillespie et al., 2007**). Psychological resilience is the ability of the nursing staff to adapt to workplace stress (**Boamah et al., 2016; Tarantino et al., 2013**). A resilient nursing staff is more able to succeed in coping with stress, tolerate change and show a low level of change fatigue, as well as an elevated level of job satisfaction (**Badu et al., 2020**).

Change fatigue in nurses is an unsearched harmful impact of continual organizational change. One research compared change fatigue and resilience among clinical nurses. Using a multiple regression model, the study found a negative relationship between change fatigue and resilience. The study showed that when hospital bed count grew, so started changing fatigue. Change fatigue was predicted by gender, with male nurses scoring higher than female nurses. Also, education predicted resilience; as education increased, so did resilience (**Brown et al., 2018b**).

Shirey (2012) contends that recognizing human resilience is critical to effective change because resilient people may accept change

without suffering painful and debilitating effects (**Shirey, 2012**). Stress in the hospital setting causes emotional fatigue in nurses. Changes in the work environment might cause emotional fatigue. In Spain, researchers studied emotional annoyance (gradual condition of psychological fatigue) and resilience in 200 nurses; they found a link between emotional annoyance and fatigue. Emotional fatigue was less likely among nurses with stronger resilience (**Manzano García & Ayala Calvo, 2012**).

Job satisfaction is the degree to which nursing staff enjoy their jobs (**Ahmed et al., 2013**). It is also defined as the degree of positive affective orientation towards employment (**Lee et al., 2016**). Job satisfaction is one of the most crucial factors describing productivity and efficiency. Nursing staff are the backbone of Egypt's health care system. However, most institutions do not value their nursing staff. According to a study conducted at Mansoura University, two-thirds of nurses reported low job satisfaction and nursing staff job satisfaction is a multidimensional occurrence influenced by many variables (**Elsherbeny & El-Masry, 2018**).

Job satisfaction is a multifaceted construct including intrinsic and extrinsic job factors (**Klopper et al., 2012**). A meta-analysis review found that shift worked and rotating days, evenings, or nights; autonomy; human resources and staffing; and teamwork and cohesiveness all correlated positively with job satisfaction. Job stress, and burnout-emotional exhaustion were found to be negatively related to job satisfaction (**Dilig-Ruiz et al., 2018**). According **Elsherbeny & El-Masry, (2018)** lack of peer communication and supervisor support at work predicted a negative impact on nursing staff job satisfaction. **Matos et al. (2010)** studied the resilience and job satisfaction of 32 psychiatric nurses working in an urban medical institution. A relation was discovered between resilience and Job satisfaction. Several studies have also connected Job satisfaction to workplace empowerment (**Simoni et al., 2004**).

Shin et al., (2012) discovered that resilience influenced non-nurse workers' commitment to change and turnover. The study

found that nurses with more resilience coped better with organizational change (**Shin et al., 2012**). To date, there is a gap in relation to Change Fatigue, Resilience, and job satisfaction. Nursing staff are highly susceptible to change fatigue, which causes stress, burnout, and raises job dissatisfaction, as well as affect nurse's wellbeing and work performance and patient safety, which may influence nurses' resilience levels which will be influence commitment to change. Although there are many studies on job satisfaction among staff nurses in Egypt, there is a gap in relation to Change Fatigue, Resilience, and job satisfaction. So, the aim of this study is to explore the relationship between change fatigue, resilience, and job satisfaction of staff nurses at Mansoura university hospital.

Aim of the study

Is to explore the relationship between change fatigue, psychological resilience, and job satisfaction of nursing staff at Mansoura university hospital

Research Questions

- Is there is a relationship between change fatigue, psychological resilience and job satisfaction of hospital staff nurses?

Research Hypothesis

- There is a negative relation between change fatigue, and job satisfaction of hospital nursing staff
- There is a positive relation between psychological resilience, and job satisfaction of hospital nursing staff

Significance of the study

Nursing staff are highly susceptible to health care system change fatigue, which causes stress, burnout, and raises job dissatisfaction, as well as affect nurse wellbeing and work performance and patient safety, which may influence nurses' resilience levels which will be influence commitment to change and increase intent to leave work and turnover. Although there are many studies on job satisfaction

among staff nurses in Egypt, still there is a gap in relation to Change Fatigue, Resilience, and job satisfaction. So this study was examined the relationship among change fatigue, resilience, and job satisfaction.

Operational Definitions

- Change Fatigue is the overwhelming feeling of stress, exhaustion, and burnout associated with rapid and continuous change in the workplace(**McMillan & Perron, 2013a**).

- Resilience may be viewed as a measure of stress coping ability (**Connor & Davidson, 2003; Delgado et al., 2017**).

- Job satisfaction refers to the extent to which employees like their jobs. It is also defined as the degree of positive affective orientation towards employment (**Lee et al., 2016**).

Subjects and Method

Research design: The current study used a descriptive, and correlation research design.

Setting: The study was carried out at Mansoura University Hospitals (Mansoura University Pediatric Hospital, Main Mansoura University Hospital, Cardiovascular Center, Mansoura Urology and Nephrology Center, Gastrointestinal Surgery Center).

Subjects

A convenience sample of staff nurses were recruited from five different centers and hospitals of the Mansoura university hospitals. The study was open to all nursing staff that works in these four hospitals and has at least a diploma in nursing and is willing to participate in the study. Following the ethical committee's approval, 187 nurses were invited to take part in the study. All the participants agreed to take part in the study and complete the questionnaires. The consent form stated that participation was completely confidential and voluntary. Between August 2021 and November 2021, data was collected.

Subject size

Based on data from literature (**Elsherbeny and El-Masry et al., 2018**), to calculate the sample size with precision/absolute error of 5% and type 1 error of 5%, Sample size = $[(Z_{1-\alpha/2})^2 \cdot P(1-P)]/d^2$, where $Z_{1-\alpha/2}$ at 5% type 1 error ($p<0.05$) is 1.96, P is the expected proportion in population based on earlier studies of job satisfaction among staff nurses and d is the absolute error or precision. Therefore, sample size = $[(1.96)^2 \cdot (0.618) \cdot (1-0.618)]/(0.07)^2 = 185.1$. Based on the formula, the sample size needed for the study is 186 (**Elsherbeny & El-Masry, 2018**).

Tool validity and reliability

Study tools (Change fatigue, and McCloskey/Mueller Satisfaction) have been translated into Arabic by researchers and the tools were given to a panel of five experts in the psychiatric nursing and Nursing Administration Department at the Faculty of Nursing Mansoura University to tested for its content validity and relevance and so the necessary modification done. The reliability of the tool was assessed by using test re-test. The Cronbach's Alpha coefficient for the scales (Change fatigue, Connor-Davidson Resilience Scale and McCloskey/Mueller Satisfaction) in the present study were (0.905, 0.872, and 0.891) respectively, which showed satisfactory level.

Furthermore, a pilot study for the data collection tools were carried out on (19) of nursing staff from Mansoura university hospitals that randomly selected, and excluded from the total sample, after the development of the tools and before starting data collection.

Tools

Three tools were used for data collection. In addition to sociodemographic that includes age, gender, education qualification, occupation, marital status, workplace, experience in years, number of working hours per week, and nurse currently enrolled in nursing program study.

The data of the study will be collected by using the following three tools:

1.Change fatigue scale it was developed by the by **Bernerth et al., (2011)** It includes 6 items. A five-point Likert scale (1=Strongly Disagree to 5=Strongly Agree) will be used to evaluate the responses of the staff nurses. Items were changed to include staff nurse-specific wording, such as "hospital" rather than the generic "organization." As a result, items such as "We are being asked to change too many things at my hospital" are common. It has existing evidence of reliability (coefficient $\alpha = .86$) (**Bernerth et al., 2011**).

2.The Connor-Davidson Resilience Scale -CD-RISC-10 (Arabic version) is made up of 10 statements that describe various aspects of resilience. It has existing evidence of reliability (coefficient $\alpha = .89$) (**Connor & Davidson, 2003**). The scale is primarily used to assess hardiness, with items corresponding to flexibility (1 and 5), self-efficacy (2, 4 and 9), emotion regulation (10), optimism (3, 6 and 8), and cognitive focus/keeping attention under stress (7). Each item is scored on a five-point scale ranging from 0 to 4, with 0 showing that the resilience statement is false and 4 showing that the statement is always true. The total score is calculated by adding all ten items together. As a result, the total can range from 0 to 40 (**Jrt et al., 2021; Toma et al., 2017**).

3.McCloskey/Mueller Satisfaction Scale

The scale was developed by Mueller and McCloskey in 1990. It is a 31-item self-report questionnaire with a five - point Likert scale from extremely satisfied to extremely dissatisfied. This scale measures satisfaction with extrinsic rewards, scheduling, family/work balance, coworkers, interaction, professional opportunities, praise/recognition, and control/responsibility. Each item is scored on a scale of 1 to 5, with 5 being the highest level of satisfaction. The Cronbach's Alpha coefficient for the scale was 0.89 (**Mueller et al., 1990; Tourangeau et al., 2006**).

Procedure & Ethical considerations:

- This study will be carried out in Mansoura University hospitals, following approval from the Ethical Committee (**Ref. No. P0233**) as a prerequisite for continuing with the

current study, as well as acceptance from the hospital administrator after explanation of the purpose of the study. Nurses who have recruited will complete the questionnaire online in Google format. The researchers will explain the purpose of the study as well as the aspects of the questionnaire that are related to Change Fatigue, Resilience, and Job Satisfaction, and there are no correct or incorrect answers. The researcher will obtain informed consent from the participants online. Confidentiality will be assured to the nurse; participation will be completely voluntary. The questionnaire will take 10-15 minutes to complete. Nurses receive no monetary compensation for their participation.

Data analysis:

SPSS version 23 was used to analyse the data (Armonk, NY: IBM Corp.). Numbers and percentages were used to represent categorical variables. The Shapiro test was used to determine the normality of numerical variables, which were found to have a non-parametric distribution. They were displayed as the median (Q1-Q3). The Mann-Whitney test was used for two-group comparisons, and the Kruskal-Wallis test was used for comparisons of more than two groups. P<0.05 was regarded as statistically significant.

Results

Table (1): Most of the nurses were age 25-45 years (51.9%), most were female (81.8%), and married (74.3%). Concerning place of work (27.8%) worked at main Mansoura university hospital (22%) worked at pediatric hospital, GIT center, and Urology center, and only (8%) of them worked at cardiovascular hospital. Almost (42 %) of nurses had experience more than 16 years. Most participants reported that they worked less than 45 hours per week (81.3%), and one third of them had bachelor's degree of Nursing and more university degree (35.8%).

Table (2): represents that there was a statistically significant difference between job satisfaction scale overall score and the nurses' age group more than 45 years, and nurses who

had diploma, the p value equal (0.007, 0.002) respectively. Furthermore, it shows that there was a statistically significant difference between psychological resilience scale score and the nurses that working in hospital urology center ($P=0.04$).

Table (3): shows that there is a statistically significant difference between nurses' who work at (Urology center), nurse's experience (6-10 years) and psychological resilience (Cognitive focus domain) ($P=0.002$, $P=0.02$) respectively.

Table (4): represents that there was a statistically significant association found between nurses aged more than 45 years and scheduling subscale of job satisfaction ($P\leq 0.001$). Statistically significant correlation was found between nurse's place of work regard (Children hospital and Main hospital of Mansoura University) and Co-workers subscale ($P=0.02$). A statistically significant association was found between nurses' who had diploma) and the Scheduling subscale where ($P\leq 0.001$)

Table (5): illustrates that there a statistically significant association was found between nurses aged more than 45 years and the Interaction opportunities, and professional opportunities subscale, with p-value ($P=0.002$) and ($P\leq 0.001$) respectively.

Statistically significant association were found between nurse's place who work at the Main hospital of Mansoura University, and Urology center) and Interaction opportunities domain, professional opportunities domain, besides statistically significant association were found between nurses who work at (Children hospital) and the praise and recognition domain, where ($P\leq 0.001$), ($P=0.03$), and ($P=0.02$) respectively. Statistically significant association was found between nurse's who had (Bachelor's degree & or more) and the professional subscale ($P\leq 0.001$).

Table (6): summarizes the correlation matrix between study variable subscales. There was a statistically significant negative correlation between change fatigue, job satisfaction, and resilience. For change fatigue

($r = -0.22^{**}$), psychological resilience ($r = 0.19^{**}$). Moreover, psychological resilience had a statistically significant positive association with job satisfaction total score ($r = 0.18^*$). In addition, change fatigue had a statistically significant negative association with four subscales of psychological resilience Flexibility, Self-efficacy, Regulate emotion, and Optimism where the p value ($r = -0.22^{**}$), ($r = -0.15^*$), ($r = -0.16^*$) and ($r = -0.3^{***}$) respectively.

Moreover, psychological resilience had a statistically significant positive association with job satisfaction subscale score (0.18^*). And sub scales of Professional, Family and work balance, Co-workers, Interaction, and Scheduling $r =$

(0.21^{**}), (0.15^*), (0.22^{**}), (0.29^{***}), and (0.15^*) respectively. However, job satisfaction (MMSS) total score had a statistically significant positive association with the eight subscales job satisfaction that: extrinsic rewards, scheduling satisfaction, control/responsibility, and praise/recognition where the significant at $r = \leq 0.05, \leq 0.01 & \leq 0.001$; respectively.

Lastly, the result of table 6 illustrates that job satisfaction (MMSS) total score had a statistically significant positive association with psychological resilience subscales Flexibility, Self-efficacy, and Regulate emotion, where the significant at ($r = \leq 0.05, \leq 0.01 & \leq 0.001$)respectively.

Table 1. Frequency distribution of Socio-Demographic and occupational features for the studied nursing staff (N= 187)

Age (years)			
< 25	50	26.7	
25 – 45	97	51.9	
> 45	40	21.4	
Gender			
Male	34	18.2	
Female	153	81.8	
Marital status			
Single	48	25.7	
Married	139	74.3	
Place of work			
Pediatric hospital	40	21.4	
MUH	52	27.8	
Cardiovascular hospital	15	8.0	
Kidney hospital	39	20.9	
GIT hospital	41	21.9	
Number of working hours per week			
>45	152	81.3	
45 and more	35	18.7	
Education qualification			
Diploma of Nursing	47	25.1	
Technical institute of nursing	73	39.0	
Bachelor's degree in Nursing and more	67	35.8	
Experience (Years)			
1 – 5	72	38.5	
6 – 10	22	11.8	
11 – 15	14	7.5	
> 16	79	42.2	
Training program			
Yes	41	21.9	
No	146	78.1	

Table (2): Overall change fatigue, psychological resilience and job satisfaction scales and their variation according to socio-demographic and occupational features of the studied nurses (N= 187)

Socio-demographic and occupational features	Total	Score		
		Change fatigue	Resilience	Satisfaction
Overall	187	22(19-24)	22(17-26)	99(87-108)
Age: <25	50	21(18-23)	22(17-26.25)	100(86.75-106.25)
25-45	97	22(20-24)	22(15-25)	A
> 45	40	22(16-26)	25(21.25-27.5)	96(78-108) ^B 106(96.25-111) ^{A,B}
Kruskal-Wallis's test		P=0.15	P=0.12	P=0.007
Sex: Male	34	22(20-24)	23(18.25-28)	93.5(75.75-109)
Female	153	22(18-24)	22(17-26)	101(88-109)
Mann-Whitney		P=0.63	P=0.3	P=0.6
Marital status: Single	48	21(18-23)	21.5(15.25-24.5)	102(88.25-109.75)
Married	139	22(19-25)	23(18-26)	97(85-109)
Mann-Whitney		P=0.04	P=0.22	P=0.66
Hospital:				
Children hospital	40	22(18-26)	22(16-28)	95.5(76-109.75)
Main hospital	52	21(16.25-23.75)	23(20-28.75) ^A	101(93-107)
Cardiovascular	15	22(16-26)	25(21-26) ^B	97(96-106)
Urology	39	22(20-23)	19(15-23) ^{A,B}	92(85-107)
GIT	41	22(20-25.5)	23(16.5-26)	105(78-119)
Kruskal-Wallis's test		P=0.87	P=0.04	P=0.66
Weekly working hours:				
<45	152	22(18-24)	22(17-26)	98(86.25-109)
45 & more	35	21(19-23)	24(18-26)	101(89-109)
Mann-Whitney		P=0.27	P=0.78	P=0.74
Qualification:				
Nursing diploma	47	22(17-24)	24(20-26)	106(96-111) ^{A,B}
Technical institute	73	22(18-24)	22(17-26)	99(87-107) ^A
Bachelor & more	67	22(20-24)	21(15-26)	91(78-105) ^B
Kruskal-Wallis's test		P=0.84	P=0.52	P=0.002
Work duration: 1-5	72	21(18-23)	22(17-26)	93.5(85-105.75)
6-10	22	22(20-24)	23(17.25-30.5)	94.5(72-117.25)
11-16	14	24(20-27)	18.5(10-30.25)	101(76-109)
>16	79	22(17-25)	23(18-26)	104(96-111)
Kruskal-Wallis's test		P=0.08	P=0.5	P=0.06
Training program:				
Yes	41	22(21-24)	22(17-27)	95(82-108)
No	146	22(18-24)	22(17-26)	100(88-109)
Mann-Whitney		P=0.13	P=0.93	P=0.27

A, B, C significant difference between corresponding groups by Mann-Whitney test

Table (3): psychological Resilience sub-scales and their variation according to sociodemographic and occupational features of the studied nurses

sociodemographic and occupational features	Score Median (Q1-Q3)				
	Flexibility	Self-efficacy	Regulate emotion	Optimism	Cognitive focus
Overall	5(4-6)	7(5-9)	2(2-3)	6(4-8)	1(0-3)
Age: <25	5(4-6)	7(5-8)	2(2-4)	6(4-8)	2(0-2.25)
25-45	5(3.5-6) ^A	7(5-9)	2(2-3)	6(4-8)	1(1-3)
> 45	5(5-6) ^A	8(6-9.75)	2(2-3.75)	7(5.25-8)	1(0.25-2)
Kruskal-Wallis's test	P=0.04	P=0.06	P=0.31	P=0.34	P=0.6
Sex: Male	5(3.75-6)	7.5(5-10)	2(1.75-3.25)	7(5-8)	2(1-3)
Female	5(4-6)	7(5-9)	2(2-3.5)	6(4-8)	1(0-2)
Mann-Whitney	P=0.93	P=0.53	P=0.59	P=0.23	P=0.003
Marital status:	5(4-6)	6(5-8)	2(1.25-3.75)	6(4-8)	2(0-3)
Single	5(4-6)	7(6-9)	2(2-3)	6(5-8)	1(0-1)
Married					
Mann-Whitney	P=0.7	P=0.2	P=0.22	P=0.34	P=0.69
Hospital:					
Children hospital	5(-4)6	7(5.25-9)	2(2-3)	7(4-8)	1(0-3) ^A
Main hospital	5(4-6)	7(6-9)	3(2-4)	7(4.25-8)	2(1-3) ^B
Cardiovascular	5(4-6)	8(6-9)	2(2-3)	7(5-8)	1(0-3)
Urology center	5(4-5)	6(5-7)	2(2-3)	5(4-7)	1(0-2) ^{A, B, C}
GIT center	4(3-6)	7(5-9)	3(1-4)	6(4.5-7)	2(1-3) ^C
Kruskal-Wallis's test	P=0.13	P=0.24	P=0.71	P=0.07	P=0.002
Weekly working hours:					
<45	5(4-6)5	7(5-9)	2(2-3)	6(4-8)	1(0-3)
45 & more	4(4-6)	6(5-9)	3(2-4)	6(4-7)	2(0.2-)
Mann-Whitney	P=0.92	P=0.87	P=0.63	P=0.94	P=0.77
Qualification:					
Nursing diploma	5(5-6)	8(6-9)	2(2-3)	6(5-8)	1(1-2)
Technical institute	5(4-6)	7(5-9)	2(1-4)	6(4-8)	2(0-3)
Bachelor & more	4(4-6)	7(5-8)	2(2-3)	6(4-8)	1(0-2)
Kruskal-Wallis's test	P=0.75	P=0.25	P=0.96	P=0.83	P=0.9
Work duration: 1-5	5(4-6)	7(5-8)	2(2-3)	6(4-8)	2(0-2.75) ^A
6-10	4(3.5-7)	6.5(5.75-10)	3(1.75-4)	6.5(5-9)	2(1.4-) ^{A, B, C}
11-16	4(3-5)	5.5(3-9)	2.5(2-4)	5.5(2-10)	0(0-2.25) ^B
>16	5(4-6)	7(6-9)	2(2-3)	6(4-8)	1(1-2) ^C
Kruskal-Wallis's test	P=0.15	P=0.26	P=0.51	P=0.57	P=0.02
Training program:					
Yes	4(4-6)	6(5-8)	2(2-3)	7(5-8)	2(1-3)
No	5(4-6)	7(5-9)	2(2-4)	6(4-8)	1(0-2)
Mann-Whitney	P=0.35	P=0.52	P=0.45	P=0.12	P=0.2

A, B, C significant difference between corresponding groups by Mann-Whitney test

Table (4): Extrinsic rewards, scheduling, family and work balance and co-workers' sub-scales of job satisfaction and their variation according to socio-demographic and occupational features of the studied nurses (N= 187)

Sociodemographic and occupational features	Extrinsic rewards	Score Median (Q1-Q3)		
		Scheduling	Family and work balance	Co-workers
Overall	8(5-12)	19(15-22)	10(7-13)	8(6-9)
Age: <25	7(5-10.25)	18(13-20) ^A	9(7-12)	8(6-9.25)
25-45	8(6-12)	18(15-21.5) ^B	10(7-13)	8(6-9)
> 45	9(5-11)	21(19.5-23) ^{A,B}	9(6.25-14)	8(8-10)
Kruskal-Wallis's test	P=0.47	P≤0.001	P=0.52	P=0.52
Sex: Male	9(5.75-12)	18(12.75-21)	8(6-11)	8(5-8)
Female	8(5-11.5)	19(15.5-22)	10(7-13)	8(6-10)
Mann-Whitney	P=0.39	P=0.06	P=0.04	P=0.14
Marital status:				
Single	8(5-12)	18(15-22)	9.5(7.25-12)	8(6-9)
Married	8(5-11)	19(15-22)	10(7-13)	8(6-9)
Mann-Whitney	P=0.84	P=0.47	P=0.67	P=0.88
Hospital:				
Children hospital	9(5-12)	18(13-22)	7(6-11)	7(5-8) ^{A,B}
Main hospital	6(5-10)	19(17.25-22)	10(8-14)	8(7-10) ^{A,C}
Cardiovascular	5(3-12)	21(18-21)	7(6-15)	8(5-8) ^C
Urology	9(6-12)	18(13-22)	9(6-10)	8(7-8)
GIT	9(5.5-12)	20(15-22.5)	11(8-12)	8(7-10) ^D
Kruskal-Wallis's test	P=0.06	P=0.49	P=0.15	P=0.02
Weekly working hours:				
<45	8(5-12)	19(15-22)	10(7-13)	8(6-9)
45 & more	8(6-11)	19(14-22)	9(6-14)	8(6-10)
Mann-Whitney	P=0.98	P=0.68	P=0.85	P=0.95
Qualification:				
Nursing diploma	7(5-12)	21(19-23) ^{A,B}	11(7-14)	8(8-10) ^{A,B}
Technical institute	7(5-11)	19(15.5-21) ^A	10(7.5-13.5)	8(6-9) ^{A,C}
Bachelor & more	9(6-12)	17(13-22) ^B	9(7-12)	7(5-8) ^{B,C}
Kruskal-Wallis's test	P=0.09	P≤0.001	P=0.23	P≤0.001
Work duration: 1-5				
6-10	8(5-11)	18(13-19.75) ^A	9(7-12.75)	8(6-9)
11-16	9(4.75-12)	17.5(14-23.25)	8.5(7-12.5)	8(5-9)
>16	12(5.75-13)	17(13-21.25) ^B	9(6-12)	7(4-9.25)
Kruskal-Wallis's test	P=0.41	P≤0.001	P=0.43	P=0.18
Training program:				
Yes	9(6-12)	18(13-22)	9(7-12)	8(5.5-9)
No	7(5-11)	19(16-22)	10(7-13.75)	8(6-10)
Mann-Whitney	P=0.15	P=0.11	P=0.6	P=0.25

A, B, C, D significant difference between corresponding groups by Mann-Whitney test

Table (5): Interaction opportunities, professional opportunities, praise and recognition, control, and responsibility sub-scales of job satisfaction and their variation according to sociodemographic and occupational features of the studied nurses (N= 187)

Sociodemographic and occupational features	Score Median (Q1-Q3)			
	Interaction	Professional	Praise & recognition	Control & responsibility
Overall	17(14-21)	12(9-15)	12(10-15)	12(10-14)
Age: <25	18(14-21) ^A	12(9-16) ^A	12(10-15)	12(10-14)
25-45	16(13-20) ^B	11(8-14) ^B	12(10-15)	11(9-14)
> 45	20(15-22) ^{A,B}	15(10-17) ^{A,B}	12(12-13)	13(11-13)
Kruskal-Wallis's test	P=0.002	P≤0.001	P=0.64	P=0.12
Sex: Male	15.5(11.75-19)	10(6-14)	12.5(10-15.25)	11(10-13.25)
Female	18(14-21)	12(10-15)	12(10-14)	12(10-14)
Mann-Whitney	P=0.1	P=0.002	P=0.59	P=0.37
Marital status:	18.5(14-21)	12.5(8.25-16)	12(9.25-15)	12.5(10-14)
Single	17(13-20)	11(9-15)	12(11-14)	12(10-13)
Married				
Mann-Whitney	P=0.27	P=0.33	P=0.65	P=0.45
Hospital:				
Children hospital	17(11.5-20) ^A	11(8.25-14.75) ^A	11.5(10-12) ^{A,B,C}	12(9-13)11
Main hospital	19.5(15-21) ^{A,B}	14(12-16) ^{A,B}	12(11.25-15) ^A	10(10-13)
Cardiovascular	21 ^{A,B}	14(11-15) ^C	12(12-13)	11(10-13)
Urology	15(14-21)	10(8-12) ^{C,D}	13(11-14) ^B	13(11-14)
GIT	16(13-19) ^{B,C}	13(9-16) ^D	14(10.5-16) ^C	12(9-15.5)
19(13-21.5) ^C				
Kruskal-Wallis's test	P=0.03	P≤0.001	P=0.02	P=0.21
Weekly working hours:				
	17(13-21)	11.5(9-15)	12(11-14)	12(10-14)
<45	19(15-21)	12(10-15)	12(9-16)	12(10-14)
45 & more				
Mann-Whitney	P=0.22	P=0.83	P=0.75	P=0.47
Qualification:				
Nursing diploma	20(15-22) ^A	14(10-16) ^A	12(12-15)	13(10-13)
Technical institute	17(14-21)	13(9-15) ^B	12(10-15)	11(10-13)
Bachelor & more	16(13-20) ^A	11(8-12) ^{A,B}	12(10-14)	12(9-14)
Kruskal-Wallis's test	P=0.002	P≤0.001	P=0.22	P=0.58
Work duration: 1-5				
6-10	17(14-20)	11(9-14)	12(10-14.75)	12(11-13.75)
	16(13-20)	10(6-14)	12(7-16.25)	10.25(8-16)
11-16	14.5(10-21)	11.5(10.75-13.25)	12.5(10-14)	10(9-14.25)
>16	20(14-21)	14(10-15)	12(12-14)	13(10-14)
Kruskal-Wallis's test	P=0.2	P=0.15	P=0.93	P=0.23
Training program:				
Yes	17(13.5-20)	11(9-13)	11(9.5-14)	12(10-14)
No	18(13.75-21)	12(9.75-15)	12(11.15-)	12(10-14)
Mann-Whitney	P=0.34	P=0.09	P=0.1	P=0.87

A, B, C, D significant difference between corresponding groups by Mann-Whitney test

Table 6: The correlation between change fatigue, resilience and satisfaction scales and subscales of the studied nurses (N= 187)

Variables	Spearman's correlation coefficient (r)		
	Change fatigue	Psychological Resilience	Job Satisfaction
Psychological Resilience	-0.22**		
Job Satisfaction	-0.19**	0.18*	
Psychological Resilience subscales			
Flexibility	-0.22**	0.74***	0.22**
Self-efficacy	-0.15*	0.87***	0.19**
Regulate emotion	-0.16*	0.56***	0.2**
Optimism	-0.3***	0.81***	0.11
Cognitive focus	0.03	0.6***	0.02
Job Satisfaction subscales			
Extrinsic rewards	0.12	-0.35***	0.39***
Scheduling	0.07	0.21**	0.81***
Family and work balance	-0.18*	0.15*	0.58***
Co-workers	-0.19**	0.22**	0.69***
Interaction	-0.29***	0.29***	0.74***
Professional	-0.2**	0.15*	0.7***
Praise & recognition	-0.02	0.13	0.68***
Control & responsibility	0.04	0.11	0.59***

*, **, *** significant at r ≤ 0.05, ≤ 0.01 & ≤ 0.001; respectively

Discussion

The aim of this study was to explore the relationship between change fatigue, psychological resilience, and job satisfaction among nursing staff at Mansoura University Hospitals. Hospitals facing many challenges to remain competitive and successful, pushing them to change and reevaluate their strategies periodically. Due to the increased participation of the workforce in the change process, managing change effectively is the biggest challenge. Therefore, both managers and change managers must recognize how nursing staff can be effectively encouraged and prepared for change (Sikh 2011; Anjuguna, 2016).

Organizational change results in increased job dissatisfaction, high turnover, and change fatigue (Bernerth et al., 2011; McMillan & Perron, 2013a). Healthcare changes, and job satisfaction are important determinants for nursing retention (Caricati D et al., 2014). It is important that study the relationship between change fatigue, resilience, and job satisfaction among nursing staff at Mansoura University Hospitals.

Result of this study showed that change fatigue had a statistically significant negative association with resilience, job satisfaction, four subscales of resilience (flexibility, self-efficacy, regulate emotion, and optimism), and with four subscale of job satisfaction (family/work balance, co-workers, interaction, professional opportunities). This finding is consistent with those published previously by (Brown et al., 2018a). This may be due to with change fatigue, nursing staff are detached from changing and are indifferent to change and do not express their opposition despite feeling it openly (McMillan & Perron, 2013a). Since those behaviors are passive, nursing managers often do not note change fatigue. It is vital to apprehend the consequences of change fatigue so that it is easily checked. This may be due to that Mansoura university hospitals size, in other words when the number of beds increased, change fatigue increase

Moreover, the result of this study showed that resilience had a statistically significant positive association with job satisfaction, and subscale of job satisfaction (professional, family and work balance, co-workers, Interaction, and scheduling). The present study finding was congruent with

Larrabee et al., (2010); Matos et al., (2010), who found a positive relation between resilience and job satisfaction. In contrast to the findings **In the same line** study done by **Teo et al.,(2013)**, found a negative association between change fatigue and job satisfaction. Also, study done by **Brown et al., (2018a)**, to examine relationships between change fatigue, resilience, and job satisfaction in one Midwestern state among novice and seasoned hospital staff nurses; found that job satisfaction had a statistically significant negative association with change fatigue and significant positive association with resilience. While study done by, **(Shin et al., 2012)** found that resilience was positively correlated to change fatigue.

Results of this study showed that there is a significant relation between job satisfaction and diploma nursing staff aged 45years. As nursing staff aged more than 45 years, and having diploma degree having high job satisfaction. Our findings congruent with past studies that were conducted in England **(Price, 2002)** and Australia, **(Skinner et al.,2012)**, who found that older nurses are more satisfied with their jobs. Also, our finding concurs with study done by **Al-Haroon et al., (2020)**, who found there was a significant age difference in overall job satisfaction especially in nurses whose ages were ≥ 40 years obtained higher scores than their younger. In the same line **Clark et al., (2021)**, found that job satisfaction was higher among old and longer working as a nurse. In contradistinction to the present findings, study conducted in KSA did not find a significant association between job satisfaction and age **(Alshmemri, 2014)**.

The result of the present study showed that there was a statistically significant association between nurse's place of work regard (Mansoura Nephrology and Urology center), nurses experience, Work duration 6-10 years and resilience cognitive focus domain. This may be due to demographic change and increasing frequency of hospital admissions lead to an increased demand for highly skilled care. Mansoura Nephrology and Urology center calls for strategies to improve the retention of already trained nursing staff and so satisfaction

and resilience significantly increased with increasing duration of practice as a nurse.

In contradictory study done by **Clark et al., (2021)**, to evaluate the effects of resilience on work engagement among emergency department nurses; found that resilience was higher among emergency nurses and longer tenure as a nurse. Also study by **Vestal, (2013)**, found that new graduate nurses are more affected by change fatigue.

The result of this study showed that there was a statistically significant association was found between nurses age more than 45 years and Scheduling subscale of job satisfaction. Also, there is statistically significant association were found between nurse's place of work regard (Children hospital and Main hospital of Mansoura University) and the median of Co-workers subscale. Moreover, there is a statistically significant association found between nurses' qualifications (Nursing diploma) and the median of Scheduling subscale. Contradictory to this finding, a study done by **Jakimowicz et al., (2018)**, found that intensive care unit nurses reported average levels of satisfaction. Nurses with postgraduate qualifications had significantly higher satisfaction scores.

Conclusion

Based on the results of the current study it can be concluded that the studied nurses offered important insight into the effect of organizational change on nursing staff psychological resilience and job satisfaction. There was a statistically negative correlation between change fatigue and both job satisfaction and psychological resilience. Moreover, psychological resilience had a significant positive association with the total score of job satisfaction.

Recommendations

Based on the findings of the present study, the following were recommended:

1. Health care systems should attempt to implement a set of rules and practices that would mitigate the possible negative consequences of changes fatigue.

2. Improve nurses' resilience and awareness of stress to reduce change fatigue in nursing staff, which can improve nurse job satisfaction and workplace conditions.

3.Offering psychological resilience training programs and a comprehensive approach to change fatigue management that may counter-act the negative effects of change fatigue.

References

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