

Sub-Health Status of Employed Women in Two Arab Cities

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ABSTRACT

Context: Underneath the strain of contemporary life and civilization, more rumored subjective complaints, discomfort, and manifestations with no typical pathologic features were reported, termed sub-health status. An evaluation of employed women's health status is necessary for developing health services and interventions to improve their health.

Aim: The current study aimed to identify the sub-health status of employed women in two Arab cities and compare the sub-health status of employed women in the two Arab cities.

Methods: A purposive sample of 400 employed women from 2 different Arab cities were included in the comparative cross-sectional research design. Data were collected using two tools: a structured interview questionnaire and a Sub-Health Measurement Scale Version 1.0 (SHMS V1.0).

Results: The mean score of the physiological health dimension among the Alexandria group was 31.92 ± 4.2 , and the Madina group was 34.16 ± 6.2 , both groups are classified as being in the disease status, and the statistical relation was highly significant (T test=9.255, P value=0.000). As for the psychological health dimension, both Alexandria and Madina groups were in the disease status. The mean scores were 32.60 ± 3.2 , 36.96 ± 4.3 , respectively, and the statistical relation was also highly significant (T test=11.645, P value=0.000). On the other hand, the Alexandria group showed a higher mean score (36.21 ± 6.5) than the Madina group (33.77 ± 3.0) regarding the social health dimension, and this difference was statistically significant (T test=8.476, P value=0.000); however, both groups were in the health status. The total subjective health status means score among the Alexandria group was 7.3 ± 2.3 . They rated themselves in disease condition, while the total subjective health status means score for the Madina group was 10.9 ± 2.7 . They rated themselves in sub-health conditions, and the statistical relation was highly significant (T test=13.09, P value=0.000). In general, the mean score of the total SHMS showed that both Alexandria and Madina groups were considered in the sub-health status, 105.03 ± 17.9 , 115.79 ± 15.4 , respectively, and the relation was highly significant (T test=19.789, P value=0.000).

Conclusion: Despite the mean score of the Madina, the group's physiological dimension was slightly higher than the Alexandria group; both groups are classified as being in the disease status. As for the psychological dimension, both Madina and Alexandria groups were in the disease status. On the other hand, the Alexandria group showed a higher mean score than the Madina group regarding the social health dimension; however, both groups were in the health status. The total subjective health status means score showed that the Alexandria group rated themselves in the disease status while the Madina group rated themselves in the sub-health state. In general, the mean score of the total SHMS showed that both groups were considered in the sub-health status. Sub-health status among women, mainly employed women, cannot be fully known from a traditional medical perspective. Second thought, women need to be handled with a holistic approach in which their physical, psychological, and social complaints must be managed to overcome the progression of these complaints into diseases.

Keywords: Sub-health, employed women, Arab cities

1. Introduction

World Health Organization (WHO) defined health as "a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity" (WHO, 1948). In contrast, underneath the strain of contemporary life and civilization, more rumored subjective complaints, discomfort, and manifestations with no typical pathologic features were reported, termed sub-health status (SHS) (Wang et al., 2014; Wang & Yan, 2012).

Sub-health status was initially defined in traditional Chinese medicine (TCM) as an observable decrease in vital process, physiological function, and capability for adjustment. Later, the idea of sub-health had been

widespread in many countries, including Canada, Japan, and Australia (Bi et al., 2014; Davy & Patrickson, 2012; Dunstan et al., 2013).

Also, SHS is known as the "third state," is a person's health condition lying between health and sickness as a result of an abnormality in body reaction toward stressful daily life situations that are commonly clinically undiagnosed because of the unclear or negative results of clinical investigations (Li et al., 2013; Schaefer et al., 2012; Schmid et al., 2014).

Nevertheless, the individual body at this premorbid stage (sub-health) is undoubtedly at risk of many diseases because of the individual's inability to maintain his body in a homeostatic or homoeothermic state. Individuals in SHS often suffer symptoms like non-specific pain, headache, dizziness, anxiety, chronic fatigue, irritable bowel

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syndrome, malaise, fibromyalgia, chest tightness, shortness of breath, depression, palpitation, frequent colds, dyspepsia, low mood, and sleep disorders (Cui *et al.*, 2013; Hu *et al.*, 2012; Li *et al.*, 2013). On the other hand, sub-health is considered a dynamic and reversible process, during which individuals could restore their health status if they modify their life patterns on time. Otherwise, the sub-health status will be accelerated into a disease status or even lead to death (Liang *et al.*, 2018; Lun *et al.*, 2005).

Most previous studies on sub-health status have primarily centered on academics and university students (Bi *et al.*, 2014). Seldom had few studies investigated SHS among employed women who play multiple roles and are more susceptible to higher stress, health problems, additional work, economic and educational pressures than unemployed women. Undoubtedly, many employed women carry the responsibility of their houses and youngsters, leading to an increasing workload and decreasing time to fulfill their demands (Akbari *et al.*, 2018).

Women's health is an essential element of the global amendment, even though women constitute the central stone for perceiving family health in all civilizations. On the contrary, females are seen as symbols of lower participation in decision-making, low status, and less pay. Most of the time, women are recruited in jobs requiring a high work pace with little chance for promotion. In general, terms to manage the middle status between health and illness are lacking, which results in overlooking this status by communities and accelerating the chance for developing diseases (D'Incau *et al.*, 2011; Tamanna & Geraci, 2013).

Consistent with some international health behavior studies; employed women possess elevated levels of poor health behavior practices and many other health risk behaviors such as; overweight, poor dietary patterns, lack of exercise, tobacco use, and poor sleeping habits; therefore, they usually complain from fatigue, headaches, insomnia, and forgetfulness (Chan, 2013; Gong 2014; Hu *et al.*, 2012; Li *et al.*, 2013). In this respect, early detection and meticulous nursing intervention will make the sub-healthy women recuperate to their health; otherwise, the sub-health status will probably be accelerated into disease condition (Luo *et al.*, 2007).

2. Significance of the study

A recent systematic review study concerned with SHS concludes that the available studies regarding sub-health status are few, and high-quality researches are needed to explore the health status and effect of different education programs on sub-health status (Liang *et al.*, 2018). To our knowledge, no reports have focused on the sub-health condition of employed women in the two selected Arab cities.

Lack of attentiveness to women's health, mainly employed women, will negatively impact the health of the out looked generations. Therefore, an evaluation of the health status of employed women is necessary for developing health services and interventions aiming at improving their health. Women have been given relatively

little research attention to this point in time, and limited studies have explored their self-rated health (SRH) or prevalence of the sub-health conditions.

3. Aim of the study

This study aims to:

- Identify the sub-health status of employed women in two Arab cities.
- Compare the sub-health status of employed women in the two Arab cities.

3.1. Research questions

- What is the sub-health status of employed women in two Arab cities?
- Is there any significant difference between the sub-health status of employed women in the two Arab cities?

4. Subjects & Methods

4.1. Research design

A comparative cross-sectional research design was used in the current study. Such design was used to investigate the relationship between the health-related state and other variables of interest in a defined population at a point in time and compare the results between the two study groups or more different populations (Myers *et al.*, 2013).

4.2. Research setting

The current study was carried out at four randomly selected primary health care centers. Two family health care centers (FHC) in Alexandria, Egypt, namely, El-Mandara FHC and Al-Hadra Kibly FHC, and two primary health care (PHC) centers in Al-Madina Al-Monawara city (Madina), Saudi Arabia, namely; Alnasr and Alazizia Primary Health Care centers.

4.3. Subjects

A purposive sample of 400 employed women attending the pre-mentioned primary health care centers (100 from each of the four pre-mentioned settings) for any reason other than sicknesses such as accompany their children for vaccination, follow up or examination or attending the center with a relative for clinical examination, seeking care or treatment. Study participants were selected according to the following inclusion criteria:

- Employed
- Not pregnant or breastfeed
- Not clinically diagnosed with any disease
- Willing voluntary to participate in the study

The sample size was calculated using the following formula, considering the expected proportion of sub-health status among participants as 50.0% (to obtain the largest sample size; the margin of error as 5.0%, and confidence level as 95.0%). The total calculated sample size was 385, and to compensate for expected dropouts, 400 participants were included

$$n = \frac{z^2 \times p \times (1 - p)}{\epsilon^2}$$

n = sample size
 z= confidence level
 p= expected proportion of sub-health status
 ε= margin of error

4.4. Tools of data collection

Self-reported questionnaires encompass information on sociodemographic information, and the participants' sub-health status was used for data collection in the current study via two tools.

4.4.1. A Structured Interview Questionnaire

The researchers developed this tool after reviewing recent related literature. It included questions related to sociodemographic characteristics of the studied women, such as age, residence, marital status, level of education, type of work, duration of working hours, family type, and the number of children.

4.4.2. Sub-Health Measurement Scale Version 1.0 (SHMS V1.0)

It is a multidimensional, self-report symptom inventory scale developed by a research group in China (Bi et al., 2014; Bi et al., 2019; Wang et al., 2012; Xu et al., 2011). SHMS V1.0 includes 39 items in total, which are divided into four self-rated dimensions: Physiological (14 items), psychological (10 items), social (9 items), and subjective health status (4 items). Each dimension includes many items; as shown in Table 1, SHMS V1.0 is a five-point Likert scale corresponding to a self-rated health condition (1=routinely, 2=often, 3=sometimes, 4= occasionally, 5= never). Participants were asked about symptoms that they had experienced during the previous month. The total scores were then calculated. The total score was equal to the sum of the four-dimension scores. The minimum and maximum scores for each dimension are presented in Table 1. A cutoff point score <50% was considered a disease condition, from 50% to 70% was consider a sub-health condition, and > 70% was considered a health condition.

Table (1): Theoretical framework, scoring system, and cutoff point (SHMS V1.0) according to dimensions, factors, and scale items.

Dimension	Factors	Numbers of Items	Min. score	Max. score	Disease <50%	Sub health 50-70%	Health >70%
Physiological	Physical condition	3	3	15	<7.5	7.5-10.5	>10.5
	Organ function	6	6	30	<15	15-21	>21
	Body movement function	3	3	15	<7.5	7.5-10.5	>10.5
	Vigor	2	2	10	<5	5-7	>7
Total physiological dimension		14	14	70	<35	35-49	>49
Psychological	Positive emotion	4	4	20	<10	10-14	>14
	Psychological symptoms	6	6	30	<15	15-21	>21
	Cognitive function	2	2	10	<5	5-7	>7
Total psychological dimension		12	12	60	<30	30-42	>42
Society	Social adjustment	4	4	20	<10	10-14	>14
	Social resources	3	3	15	<7.5	7.5-10.5	>10.5
	Social support	2	2	10	<5	5-7	>7
Total society dimension		9	9	45	<22.5	22.5-31.5	>31.5
Subjective Health Status	Physical health	1	1	5	<2.5	2.5-3.5	>3.5
	Psychological health	1	1	5	<2.5	2.5-3.5	>3.5
	Social health	1	1	5	<2.5	2.5-3.5	>3.5
	Overall health	1	1	5	<2.5	2.5-3.5	>3.5
Total subjective health status		4	4	20	<10	10-14	>14
Total SHMS		39	39	195	<97.5	97.5-136.5	>136.5

4.5. Procedures

The validity and reliability of the English version of SHMS V1.0 have been confirmed, with a Cronbach's alpha coefficient and a split-half reliability coefficient of 0.917 and 0.831 (Xu et al., 2011). The research tools were evaluated by a panel of 3 experts from the related field in the Faculty of Nursing at Alexandria University. They were asked to review and assess the instruments for its content and face validity. The total tool content validity index (I-CVI) was 0.89, and the content validity ratio (CVR) was 0.79. The Cronbach's alpha coefficient for the Arabic tools was 0.92 (tool 1) and 0.81 (tool 2).

Tools translation to the Arabic language was done by the researchers using the back-translation method. The two tools were piloted with a group of 40 participants (who were excluded from the study sample) to check the feasibility of the research process and clarity of the tools, and necessary modifications were done accordingly. The data collection was carried out from January to March 2018. The researchers visited each center two times per week, and about 7-10 participants were interviewed in each visit. The questionnaire was completed within 20 to 30 minutes with each participant.

Ethical considerations: The subject's rights were preserved. The researchers clarified to them the aim and the significance of the study and their role. Subjects were

assured that their responses would be kept confidential. Their participation was voluntary, and they could withdraw from the study without any effect on the quality of care they received at the PHC center. The interview was performed in a private room in each center. The research institutional review boards of Alexandria University in Egypt, and the College of Nursing at Taibah University, Ministries of health in Alexandria, Egypt, and in Al-Madinah Al-Munawara, KSA, approved the study proposal, methodology, and instruments. Besides, the required permission for data collection was obtained from the directors of the PHC centers.

4.6. Limitations of the study

Although this study has provided useful information on employed women's health and sub-health status, some limitations should be reported. First, the nature of quantitative data collection, whereby insights into participants' personal thoughts can't be solicited. Second, all information was obtained from a self-reported data collection tool, resulting in potential information bias. Using multiple assessment tools may provide more accurate and more precious data regarding SHS. Third, although validated tools had assessed the presence of suboptimal health status, these measures are not equivalent to clinical diagnoses. Thus, future studies with diagnostic interviews should be applied. Qualitative studies using larger samples, combined with focus-group interviews, are recommended for future studies.

4.5. Data analysis

Data obtained was revised, coded, and analyzed using statistical software SPSS IBM version 26. Frequency, percentage, mean and standard deviation were used for presenting univariate and bivariate variables. Chi-Square, t-test, multiple linear regression, and correlation matrix were used to estimate the degree of association. The p-value was considered statistically significant if equal or less than 0.05 and highly significant if equal or less than 0.01.

5. Results

Table 2 shows that the mean age of Alexandria study participants is 31.09 ± 8.07 compared to 29.2 ± 3.4 of Madina participants with a significant difference ($\chi^2=2.932$, $P=0.005$). The vast majority of Alexandria and Madina groups reside in urban areas (respectively, 95.5% & 89.5%); the highest percentage is married (88.5% & 82.5%, respectively). A higher rate of illiteracy/reads and write was observed among Alexandria participants (44.0%) than in Madina (13.0%). About two-thirds (61.0%) of Alexandria participants have a manual type of work, compared to 88.5% of Madina participants who had technical work. More than half (53.5%) of Alexandria participants compared to 34% of Madina participants work 30 to 40 hours per week. Living in extended families was less prevalent among Alexandria participants than Madina participants (28% & 43%, respectively). Finally, more than

three-quarters (83.5%) of Alexandria participants had 1 to 4 children than 61% of Madina participants.

Table 3 presents the women's physical dimensions. It shows higher mean scores for the assessed appetite, sleep, hair, and nail growth conditions of Madina than Alexandria participants. The differences were statistically significant for all of them. As for organ function, highly significant differences between the two groups were observed in respiratory manifestations, urinary manifestations, head and eye discomfort. Considering body movement function, difficulty with knees or bending over, difficulty climbing 3-5 floors, and difficulty walking 1500 m presented highly significant differences between the two study groups. However, assessing vigor showed a non-significant difference between Alexandria and Medina's study groups related to fatigue alleviated by rest.

Table 4 presents the mean score of the study participants' psychological dimension by their city of residence. Assessed positive emotions showed a higher mean score for Alexandria participants than Madina participants regarding satisfaction with living conditions and being optimistic about the future with highly significant differences between the two groups. As for psychological symptoms, the mean score of a bad mood or depression, feel insecure, have no reason to feel afraid, feel lonely, and be sensitive or suspicious were lower in Alexandria than in Madina study participants, with highly significant differences between the two study groups. Besides, cognitive function assessment depicted highly significant differences between the two groups regarding the ability to think and solve problems ($t=-2.329$, $p=0.000$).

Table 5 demonstrates the mean score of social adjustment as a social dimension of the study participants by their city of residence. Alexandria study participants showed a higher mean of satisfaction with; social relations, performance in life, work, school, and quickly adapt to new living than Madina participants with highly significant differences between the two groups. Table 5 also shows highly significant differences in social resources between the two study groups regarding always keep in touch with friends and family, share happiness and sadness with friends, and have many close friends, colleagues, classmates, neighbors, and relatives. Finally, higher mean scores of social supports were observed in Alexandria participants than Madina participants regarding; family, friends, colleagues, relatives provide physical or emotional support when needed and seek help and support from others when in trouble.

Table 6 represents the study participant's sub-health status dimensions. Starting with the physiological condition, more than three quarters (77.5%) of Alexandria participants were in the sub-health status compared to slightly more than half (53%) of Madina participants, with a highly significant difference between the groups ($t=8.088$, $p=0.000$). However, organ function showed lower rates of sub-health for Alexandria participants (6%) than Madina participants (19.5%), but 94% of Alexandria participants were in the disease status compared to 77% of Madina

participants, and those differences were highly significant ($t=9.821$, $p=0.000$). Nevertheless, total physiological dimension scores showed lower sub-health status but higher disease status for Alexandria participants compared to Madina participants (respectively, 35%, 65% & 57.5%, 40%) with highly statistically significant differences between the two groups ($t=9.255$, $p=0.000$).

Regarding the psychological dimension, Table 6 presents that the positive emotion means the score was higher in the Alexandria group (18.54 ± 2.8) compared to the Madina group (16.84 ± 3.2), with a statistically significant difference between both groups. Besides, the mean score of psychological symptoms for Alexandria participants (7.17 ± 2.8) was less than the mean score of Madina participants (12.75 ± 4.4), and this difference was highly significant ($t=14.261$, $p=0.000$). However, 45.5% of Alexandria participants were in the sub-health status for the cognitive function compared to 36% of Madina participants, with a high statistical significance difference ($t=3.23$, $p=0.001$). Although the total psychological dimension scores showed a slight difference in the mean scores between the two groups, this difference was highly significant ($t=11.645$, $p=0.000$).

As for the social dimension, Alexandria participants show a higher mean score for total social health than Madina participants (36.21 ± 6.5 & 33.77 ± 3.0 , respectively), and this difference was highly significant ($t=8.476$, $p=0.000$). Furthermore, for subjective health status, a lower mean score of total subjective health status was observed for Alexandria participants (7.3 ± 2.3) than Madina participants (10.9 ± 2.7), and this result showed a high statistically significant difference ($t=13.09$, $p=0.000$).

In general, the total SHMS results depicted a less mean score for Alexandria participants (105.03 ± 17.9) than Madina participants (115.79 ± 15.4), and this result documented a high statistically significant difference between the two groups ($t=19.789$, $p=0.000$).

Table 7 presents that the physiological dimension was significantly associated with the total subjective health status dimension ($r=0.369$, $p=0.021$), and showed high significant association with the psychological dimension ($r=0.456$, $p=0.005$), in addition to the total SHMS ($r=0.588$, $p=0.000$). Moreover, the psychological dimension was significantly associated with the social dimension ($r=0.287$, $p=0.049$) and highly significantly associated with the total SHMS ($r=0.613$, $p=0.000$). Nevertheless, the social dimension was significantly associated with the total subjective health status dimension and the total SHMS (respectively $r=0.277$, $p=0.042$ & $r=0.335$, $p=0.011$). Finally, the total subjective health status dimension was significantly associated with the total SHMS. Also, the association was highly significant at ($r=0.460$, $p=0.009$).

As revealed by Table 8, both age and marital status were significantly associated with the sub-health scale for both Alexandria and Madina groups (respectively, $t=8.133$, $p=0.018$ & $t=7.482$, $p=0.014$, $t=5.024$, $p=0.014$ & $t=6.351$, $p=0.012$). The qualification was significantly associated with the sub-health scale for only the Alexandria group

($t=6.460$, $p=0.017$). In addition, high significant association was detected between the sub-health status and both employment and family type for both Alexandria and Madina groups (respectively, $t=12.260$, $p=0.001$ & $t=13.011$, $p=0.001$, $t=11.370$, $p=0.003$ & $t=12.001$, $p=0.005$). Finally, the number of children was statistically significant in the Madina group's sub-health status and highly significant in the Alexandria group. However, the residence place did not show any association with the sub-health status in both study groups.

Table (2): Comparison of study participants' sociodemographic characteristics by their city of residences (n=400).

Characteristics	Alexandria (N=200)		Madina (N=200)		χ^2	P-value
	N	%	N	%		
Age						
20-<30	95	47.5	59	29.5	2.93	0.00
30-<40	73	36.5	78	39		
40-<50	23	11.5	5	2.5		
50 or more	9	4.5	58	29		
Mean \pm SD	31.09 \pm 8.07		29.2 \pm 3.4			
Residence					1.35	0.04
Urban	191	95.5	179	89.5		
Rural	9	4.5	21	10.5		
Marital Status					8.89	0.00
Single	13	6.5	26	13		
Married	177	88.5	165	82.5		
Divorced	10	5.0	9	4.5		
Level of education					6.16	0.00
Illiterate/ Read & Write	88	44.0	26	13.0		
Primary	32	16.0	52	26.0		
Middle/High school/Diploma	56	28.0	65	32.5		
University	21	10.5	57	28.5		
Postgraduate	3	1.5	26	13.0		
Type of work					1.79	0.00
Specialist	25	12.5	18	9.0		
Technical	52	26.0	177	88.5		
Manual	122	61.0	4	2.0		
Others	1	0.5	1	0.5		
Duration of working hours					9.58	0.00
less than 30 hours/ week	32	16.0	51	25.5		
From 30-40 hours/ week	61	30.5	81	40.5		
More than 40 hours/ week	107	53.5	68	34.0		
Type of family					3.16	0.00
Nuclear	144	72	114	57		
Extended	56	28	86	43		
Number of children					8.67	0.00
Zero	26	13	73	36.5		
1 - 4	167	83.5	122	61		
5 - 8	7	3.5	5	2.5		
Mean \pm SD	1.98 \pm 1.31		0.86 \pm 1.32			

Table (3): Comparison of study participants' physiological dimension by their city of residence (n=400).

Physiological dimension	Alexandria	Madina	t-test	p-value
Physical condition				
Appetite	3.00±0.41	3.45±0.91	6.47	0.000
Sleep	2.92±0.40	3.06±1.04	1.78	0.000
Hair and nail growth	1.63±1.04	2.42±1.36	6.57	0.000
Organ function				
Respiratory manifestation (palpitation, chest tightness, shortness of breath)	1.20±0.61	2.07±0.96	10.75	0.000
Gastrointestinal discomfort (acid reflux, nausea, bloating, constipation, diarrhea, belching)	2.00±1.01	2.46±1.20	4.19	0.144
Urinary tract manifestation (dysuria, oliguria, nocturia)	1.07±0.37	1.56±0.88	7.55	0.000
Head discomfort	1.86±1.42	2.38±1.09	4.03	0.000
Eye discomfort	1.36±0.86	2.03±1.07	6.95	0.000
Ear discomfort	1.30±0.83	1.44±0.82	1.63	0.054
Body movement function				
Difficulty with knees or with bending over	2.92±0.57	1.92±1.15	11.03	0.000
Difficulty in climbing 3-5 floors	3.18±0.62	2.25±1.32	9.04	0.000
Difficulty in walking 1500 m	3.14±0.78	2.14±1.17	10.15	0.000
Vigor				
Fatigue alleviated by rest	3.19±1.09	3.18±1.28	0.084	0.022
Have enough energy to cope with everyday life, work, and learn	3.15±1.24	3.60±1.21	3.76	0.278
Total physiological aspect	31.92±4.26	34.16±6.22	9.255	0.000

*A maximum mean score for each item equals 5.

Table (4): Comparison of study participants' psychological dimension by their city of residence.

Psychological dimension	Alexandria	Madina	t-test	p-value
Positive emotion				
Confidence	4.48±1.178	4.28±0.958	1.816	0.433
Satisfaction with living conditions	4.69±0.899	4.24±1.015	4.642	0.000
Optimistic about future	4.77±0.599	4.38±0.964	4.858	0.000
Feeling happy	4.60±0.971	3.94±1.026	6.658	0.016
Psychological symptoms				
Feel nervous	1.39±1.041	2.76±1.015	-13.279	0.054
Bad mood or depression	1.14±0.540	2.46±1.027	-16.152	0.000
Feel insecure	1.14±0.540	1.86±1.105	-8.223	0.000
Have no reason to feel afraid	1.12±0.507	1.67±0.914	-7.443	0.000
Feel lonely	1.12±0.549	1.84±1.049	-8.544	0.000
Sensitive or suspicious	1.26±0.733	2.16±1.232	-8.778	0.000
Cognitive function				
Memory	3.23±0.965	3.50±1.051	-2.675	0.845
Ability to think and solve problems	3.66±0.690	3.87±1.072	-2.329	0.000
Total psychological aspect	32.60±3.26	36.96±4.37	11.645	0.000

*A maximum mean score for each item equals 5.

Table (5): Comparison of the study participants' social dimension by their city of residence.

Social dimension	Alexandria	Madina	t-test	p-value
Social adjustment				
Appropriately deal with unhappy events	3.79±1.343	3.70±1.066	0.742	0.10
Satisfied with the social relation	4.30±1.308	4.01±1.042	2.495	0.001
Satisfied with performance in life, work, school	4.63±0.704	4.18±0.906	5.545	0.000
Quickly adapt to new living, working, and learning environment.	3.88±0.783	3.86±1.058	0.215	0.000
Social resources				
Always keep in touch with friends and family	3.76±0.630	3.68±1.105	0.778	0.000
Share happiness and sadness with friends	3.70±0.551	3.72±1.145	0.223	0.000
Have many close friends, colleagues, classmates, neighbors, and relatives	4.26±0.669	3.60±1.121	7.206	0.000
Social support				
Family, friends, colleagues, relatives provide physical or emotional support when needed	4.46±0.776	4.02±1.100	4.727	0.000
Seek help and support from others when in trouble	3.43±0.767	3.00±1.205	4.208	0.000
Total social aspects	36.21±3.1	33.77±6.54	8.476	0.000

*A maximum mean score for each item equals 5.

Table (6): Comparison of the study participant sub-health status dimensions by their city of residence (n=400).

Dimensions / factors	Alexandria (N=200)							Madina (N=200)							t-test/ P-value
	Mean ± SD	Health		Sub-health		Disease		Mean ± SD	Health		Sub-health		Disease		
		N	%	N	%	N	%		N	%	N	%	N	%	
Physiological Dimension															
Physical condition	7.55±1.1	0	0	153	77.5	47	23.5	8.93±2.2	42	21	106	53	52	26	8.088 0.000
Organ function	8.79±2.5	0	0	12	6	188	94	11.94±4.2	7	3.5	39	19.5	154	77	9.821 0.000
Body movement function	9.24±1.4	39	19.5	137	68.5	24	12	6.31±3.1	22	11	158	79	20	10	12.62 0.000
Vigor	6.34±1.9	58	29	95	47.5	37	18.5	6.78±1.8	74	37	107	53.5	19	9.5	2.40 0.017
Total Physiological	31.92±4.2	0	0	70	35	130	65	34.16±6.2	5	2.5	115	57.5	80	40	9.255 0.000
Psychological Dimension															
Positive emotion	18.54±2.8	135	67.5	47	23.5	18	9	16.84±3.2	154	77	40	20	6	3	5.334 0.000
Psychological symptoms	7.17±2.8	0	0	9	4.5	191	95.5	12.75±4.4	11	5.5	69	34.5	120	60	14.261 0.000
Cognitive function	6.86±1.2	100	50	91	45.5	9	4.5	7.37±1.6	120	60	72	36	8	4	3.23 0.001
Total Psychological	32.60±3.2	4	2	170	85	26	13	36.96±4.3	21	10.5	165	82.5	14	7	11.645 0.000
Social Dimension															
Social adjustment	16.60±2.7	161	80.35	30	15	9	4.5	15.75±3.2	152	76	40	20	8	4	7.83 0.005
Social resources	11.72±1.0	78	39	108	54	14	7	11.00±2.9	124	62	76	38	0	0	11.65 0.000
Social support	7.89±1.0	161	80.5	33	16.5	6	3	7.02±1.9	88	44	90	45	22	11	6.09 0.001
Total Social Health	36.21±6.5	126	63	64	32	10	5	33.77±3.0	175	87.5	25	12.5	0	0	8.476 0.000
Subjective Health Status															
Physical health	1.9±.53	5	2.5	188	94	7	3.5	3.0±1.0	93	46.5	102	51	5	2.5	13.59 0.000
Psychological health	2.1±.96	89	44.5	104	52	7	3.5	2.5±1.15	47	23.5	149	74.5	4	2	8.762 0.000
Social health	1.6±.93	58	29	142	71	0	0	2.4±.92	122	61	77	38.5	1	0.5	7.892 0.000
Overall health	1.7 ±.15	8	4	180	90	12	6	3.0±.93	108	54	91	45.5	1	0.5	17.74 0.000
Total subjective Health Status	7.3±2.3	81	40.5	100	50	19	9.5	10.9±2.7	112	56	80	40	8	4	13.09 0.000
Total SHMS	105.03±17.9	58	29	95	47.5	47	23.5	115.79±15.4	87	43.5	88	44	25	12.5	19.789 0.000

Table (7): Correlation matrix between the dimensions of the sub-health scale.

Dimension	Physiological	Psychological	Social	Total subjective health status	Total SHMS
Physiological		r. 0.456 p. 0.005	r. 0.124 p. 0.062	r. 0.369 p. 0.021	r. 0.588 p. 0.000
Psychological	r. 0.456 p. 0.005		r. 0.287 p.0.049	r. 0.164 p. 0.065	r. 0.613 p. 0.000
Social	r. 0.124 p. 0.062	r. 0.287 p.0.049		r. 0.277 p. 0.042	r. 0.335 p. 0.011
Total subjective health status	r. 0.369 p. 0.021	r. 0.164 p. 0.065	r. 0.277 p. 0.042		r. 0.460 p. 0.009
Total SHMS	r. 0.588 p. 0.000	r. 0.613 p. 0.000	r. 0.335 p. 0.011	r. 0.460 p. 0.009	

Table (8): Multiple linear regression model between sub-health status and sociodemographic characteristics of the study participants by their city of residence.

Sociodemographic characteristics	Alexandria			Madina		
	Unstandardized Coefficients	standardized Coefficients	T-test P	Unstandardized Coefficients	standardized Coefficients	T-test P
	B	β		B	β	
Age	0.385	0.374	8.133 0.018	0.461	0.454	7.482 0.014
Residence	0.058	0.111	1.564 0.064	0.108	0.154	2.825 0.051
Qualification	0.489	0.425	6.460 0.017	0.211	0.717	2.407 0.055
Marital status	0.197	0.231	5.024 0.014	0.354	0.656	6.351 0.012
Type of work	0.621	0.710	12.260 0.001	0.702	0.708	13.011 0.001
Type of family	0.519	0.499	11.370 0.003	0.609	0.417	12.001 0.005
Number of children	0.693	0.688	8.033 0.009	0.466	0.510	5.164 0.011

a . Dependent Variable: Sub health scale, b. Predictors: (constant) Age, Residence, Qualification, Marital status, Type of work, Type of family, Number of children

6. Discussion

Sub-health status is detrimental not only to those who suffer but also to the community at all. Since the symptoms are less noticeable than those of disease, the sub-health condition cannot be confirmed or diagnosed due to the negative results of medical and clinical investigations. For this reason, symptoms are often ignored, despite overlooking these warning signs decrease the risk of developing chronic diseases (Dunstan et al., 2013; NoHu et al., 2012).

Based on previous studies, early warning for the disease is very promising and challenging. Indeed, health care providers, including nurses, can intervene on the sub-health condition among women with preventative care before it is confirmed with a medical diagnosis (Hu et al., 2012; Li et al., 2013). Therefore, the primary purpose of the current study was to identify the sub-health status of employed women in two Arab cities and compare the sub-health status between employed women in two Arab cities.

The current results pointed out a highly significant difference between the health, sub-health, and disease status of both Alexandria and Madina groups concerning the physical dimension. About three-quarters of Alexandria participants and about half of Madina participants rated

themselves in sub-health conditions. They complained of poor sleep and appetite loss in the four weeks preceding the study. Also, they were unsatisfied with their hair and nail growth. Subsequently, they were classified as being in the sub-health status. Similarly, another study carried out among urban Chinese women noted that self-rated health (SRH) of urban Chinese women was moderate. The most common complaints were fatigue, eye discomfort, and insomnia (Cheng et al., 2015).

Regarding the organ function, highly significant differences were detected between the health, sub-health, and disease status of Alexandria and Madina participants. The vast majority of Alexandria participants and about three-quarters of Madina participants rated themselves in disease status. They reported respiratory manifestations such as; palpitation, chest tightness, shortness of breath, and gastrointestinal discomforts, including; acid reflux, nausea, bloating, constipation, diarrhea, or belching. Also, they reported urinary tract manifestations like; dysuria, oliguria, and nocturia. Besides the head, eye, and ear discomforts.

In accordance, a previous study was carried out to investigate the health status of 11144 students denoted that more than half of the study subjects were in the sub-health status. About a quarter of them were in the disease status. The significant reported diseases were respiratory and

digestive systems, such as chronic rhinitis, chronic gastritis, chronic pharyngitis, piles, chronic bronchitis, and a gastroduodenal ulcer (Bi et al., 2014). The main types of diseases were the same denoted in the current study. Still, the prevalence of the disease status was less than the current study, which can be justified by the differences in the sample size and subjects' characteristics. Our results were contradicted by other study carried out in Syria that discussed the total SRH and did not present each dimension of health separately, in particular, the results concluded that more than half of the participants reported excellent SRH compared to 35.6% reporting normal SRH and 9.1% reporting poor SRH (Asfar et al., 2007).

Concerning body movement function, highly significant differences were detected between the health, sub-health, and disease status of both Alexandria and Madina participants. About two-thirds of Alexandria participants and about three-quarters of Madina participants rated their body movement function in a sub-health state (had difficulty in the knee or bending over; they had difficulty climbing 3-5 floors in walking 1500 meters). On the contrary, a recent study aimed to explore the relationship between sub-health and occupational stress among operating theatre nurses. It illustrated that the most common physical complaints among nurses were dizziness, fatigue, headache, tinnitus, numbness of shoulder or leg, and sensation of a pharyngeal foreign body (Zhou & Gong, 2015).

Concerning vigor, about half of both Alexandria and Madina participants had reported their vigor as in the sub-health state (fatigue which does not relieve by rest, and they do not have enough energy to cope with everyday life and work). Similar results were reported in a previous study carried out on 70 female nurses in china reported that about three-quarters of the nurses in that study had one or more symptoms that last longer than one month during the year before the study time and that the most common complaint was fatigue followed by lack of energy, dreaminess or restlessness, distraction or been upset (Gong, 2014). Current study results were also supported by a previous cross-sectional study that was carried out on 1473 participants reported that about half of the female participant was in sub-health physiological condition (Li et al., 2013). Besides, a recent cross-sectional study aimed to explore the association between various lifestyle factors and suboptimal health status denoted that the prevalence rates of college students' health, sub-health, and disease status were 46.7%, 51.2%, and 2.1%, respectively (Ma et al., 2018).

The psychological dimension in the current study revealed highly significant differences between both study groups in all assessed variables: positive emotion, psychological symptom, and cognitive function. Surprisingly, the vast majority of the Alexandria group's current study participants and about two-thirds of the Madina group were in the disease's condition concerning psychological symptoms. They feel nervous, have a bad mood or depression, feel insecure, lonely, sensitive, or suspicious, and have no reason to feel afraid. This finding may be due to the stressors they experience in the

workplace and family liabilities, especially that the vast majority of the study participants in both study groups were married and have children, which makes them in a position of playing multi-roles in their life. In accordance, a recent study suggested that the sub-health and disease conditions among adults were significantly correlated with poor lifestyle factors such as physical activity level, quality of sleep, and dietary intake (Li et al., 2013). Moreover, health is affected by psychological stress directly through neuroendocrine responses and indirectly through changes in health behavior (Wang et al., 2014). Another study carried out to investigate the health and sub-health condition among students aged from 13-26 years old showed that sub-health and anxiety are more prevalent among rural adolescent's girl students, and suggested that the school heads should pay more attention to the health education for the students (Yao et al., 2015).

On the other hand, the current study participants in both groups rated themselves in health status in some assessed variables related to the social dimension, such as social adjustment and social support dimension. Despite the higher values for the Alexandria group than the Madina group in all social dimension variables, a highly significant difference was recognized between them. They can appropriately deal with unhappy events in their lives and work, were satisfied with their social relations and with their performance in their life and work, can quickly adapt to new living and working environments. They always keep in touch with friends and families and share their happiness and sadness with them. They have many relatives, friends, and neighbors close to them who support them when they need help, and finally, they seek to support and help from others when they are in trouble. These results can reflect the nature of Arab communities where people are more supportive, friendly, and come together in stressful situations and crises. Social support is considered the resources provided by other persons.

Nevertheless, perceived social support is a subjective feeling of being supported, whereas received social support is an indicator of what people receive from others. Both elements are hypothesized to be health-protective and to act as buffers to stress (Aroian et al., 2017). Current results were congruent with a study carried out in Syria, which suggested that giving social support to women when they are in need and sharing happiness and sorrow with others had a significant association with self-rated health (Asfar et al., 2007). In accordance, a study conducted in Israel depicted that poor perceived social support was an independent predictor of poor self-rated health (Gerber et al., 2009). The results of studies performed in Malaysia and Iran concluded that perceived social support showed consistent strong associations with mental health (Rashid et al., 2016; Tajvar et al., 2018). However, a contradicting study carried out among older Lebanese people did not approve of any association between the availability of social support and depression (Jawad et al., 2009). An Iranian study also found that emotional support had no direct association with poor physical and mental health (Tajvar et al., 2013).

In the current study, total SHMS revealed a highly significant difference between Alexandria and Madina groups. Also, the mean score of the total SHMS was almost similar in both groups, and both groups were in the sub-health condition. The results show that the mean score of each factor of subjective health status (physical, psychological, social, and overall health) was considered in disease condition for the Alexandria group. However, the mean score of each factor of subjective health status among the Madina group was in a sub-health condition in all factors except social factor was in a disease condition.

Those results are surprising because the health status of each physical, psychological and social dimensions "according to the mean score of each dimension" shows contradicting results with the total subjective health status among current study participants. It could be justified that the current study participants were not satisfied with their general health status. The social factors did not positively affect the study participants' subjective overall health. A study carried out among urban Chinese revealed that the sub-health status's prevalence was around 14.3% and that the sub-health status was more prevalent in women than in men (Wang *et al.*, 2014). Moreover, the prevalence of sub-health and disease in China's central region was 36.6% and 43.1%, respectively, while healthy participants accounted for only 20.3% of the total population (Li *et al.*, 2013)

Multiple linear regression analysis showed that age, qualification, family type, marital status, and the number of children are all factors that significantly affect the health condition. The type of work was the highest significant correlative variable that negatively affects the health status of employed women. These results could be attributed to the fact that high strain placed on employed women and working overtime or through the night may lead to the complete breakdown of their health. As a result, the body clock is affected, the immune system declines, and some appear with the sub-health condition.

In supporting the current study results, Yan *et al.*, mentioned that rapid economic development across China, increasing numbers of people migrating to large cities to find better employment positions, competition, and work duties in the workplace are considered significant stressors for employees who required to work long hours. Besides, the significant correlation between low SHS scores and workplace stress is evident (Yan *et al.*, 2009). Furthermore, a valuable study carried out among nurses reported high-stress levels in the workplace, in which about three-quarters of the nurses suffered from one or more sub-health symptoms, the most prevalent symptom was fatigue, occupational stress was positively correlated with age and duration of work, and that, female nurses experienced more stress in workload than male nurses (Zhou & Gong, 2015).

In general, there are no huge differences between Alexandria and Madina groups concerning sub-health status in each dimension and the total SHMS. This result could be attributed to the fact that both study groups were from cities with nearly the same cultures, considering working rules and regulation mainly in the employment and hiring process, working hours, and vacations, the social support

system, women duties within the family context, childbearing and childrearing responsibilities.

7. Conclusion

From the results of the current study, it could be concluded that although the mean score of the Madina group's physiological dimension was slightly higher than the Alexandria group, both groups are classified as being in the disease status. As for the psychological dimension, both Madina and Alexandria groups were in the sub-health status. On the other hand, the Alexandria group showed a higher mean score than the Madina group regarding the social health dimension; however, both groups were in the health status.

The total subjective health status means score showed that the Alexandria group rated themselves in the disease status while the Madina group rated themselves in sub-health status. In general, the mean score of the total SHMS showed that both groups were considered in the sub-health status. Type of work was the highest significant correlative variable that affects the health status of employed women negatively. It is hoped that the findings of the current study will allow policymakers to confront the challenges of reducing workplace stressors for employed women.

8. Recommendations

Sub-health status among women, mainly employed women, cannot be fully known from the traditional medical perspective. Second thought, women need to be handled with a holistic approach in which their physical, psychological, and social complaints must be managed probably to overcome the progression of these complaints into diseases.

Health care providers, including nurses and midwives, must be able to early detect and manage SHS among employed women who face many stressors in their life to fight the development of many preventable diseases.

Conduction of more studies is a significant promise for improving the health of employed women using innovative health and sub-health status measuring tools. These studies' outcomes will reflect positively on improving women's health.

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