Perceived Stress and Coping Strategies among Healthcare Professionals: A Cross-Sectional Observational Study

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Mohammed Amine Lafraxo[1](✉), Mohammed Ouadoud[2], Youssef El Madhi[3], Abdelmajid Soulaymani[1]
[1] Ibn Tofail University, Kenitra, Morocco
[2] Abdelmalek Essaadi University, Tetouan, Morocco
[3] Regional Center for Education and Training Trades, Rabat, Morocco
lafraxo.ma@gmail.com

Abstract—This study aimed to assess the prevalence of stress among healthcare professionals, and to study coping strategies adopted to deal with stress. This is an observational study of a cross-sectional type. A self-administered survey was used to determine the personal and professional characteristics. The Perceived Stress Scale to assess the level of perceived stress. The Ways of Coping Checklist to measure coping strategies. The Perceived Stress Scale shows that the study population is susceptible to stress. Problem-focused coping emerged as the most frequently used coping process for coping with stress. The results lead us to question the importance of coping strategies and to propose effective solutions, the use of new technology is recommended for coping with stress.

Keywords—stress, coping strategies, perceived stress scale, ways of coping checklist, data analysis, information technology

1 Introduction

The quality of life and the physical and mental health of professionals are negatively influenced by a constant increase in the prevalence of stress [1][2]. According to the transactional model of Lazarus and Folkman in 1984 [3][4], perceived stress is the result of a transaction between the person and the environment, in other words, it is an imbalance between the individual's resources to cope with these demands and the demands of his environment, it is the biological response of the human organism to a threatening situation. It is known to cause the appearance of certain physical, emotional, and intellectual symptoms [5] namely: sleep disorders, headaches, sadness, disturbed concentration, and memory problems. Indeed, these symptoms provoke in nurses a daily discomfort that can result from multiple psychosocial sources, both professional and personal. Also, the effective adoption of coping or adjustment strategies is an unavoidable necessity in the face of various psychosocial risks [6]. Being problem-focused, Being emotion-focused, and seeking social support is the set of

behavioral and cognitive processes adopted by the individual to reduce the impact of psychological demands and enhance one's well-being [7].

The main objective of this research study was to assess the perceived stress among healthcare professionals of the Hassan II Oncology Center - Oujda | Morocco. We then set out to study coping strategies adopted in the face of difficulties posed by the daily life of the nursing staff.

We wish to verify whether:

- Socio-demographic and personal characteristics may cause a stress effect on healthcare professionals.
- Nurses with higher stress tend to use more coping focused on seeking social support.

This article is composed of five main sections:

- In the first section, we will define the concept of stress.
- In the second section, we will highlight the evolution of theoretical conceptions of stress.
- In the third section, we present the research methodology adopted to evaluate stress and coping strategies.
- In the fourth section, we reveal the results of the survey and the correlation between stress and coping strategies.
- In the fifth section, we try to test our hypotheses based on the results found and compare them with the results of other studies.

2 Stress: Background

The word stress is an ambiguous and vague concept. To define it, it is essential to go back to its sources. The word stress comes from the Latin « Stringer = tender, tight » [8], it was synonymous with suffering, adversity, difficulty [9]. In English, and precisely from the 17th century onwards, stress was used to express a state of suffering and deprivation, trouble, and thus in the context of hardship [10]. Over the centuries, the meaning of the concept of stress has evolved from literature to the science of life and health. In the early 17th century, the concept of stress was used in Great Britain to describe the emotional effect of a stressful situation. In the 18th century, stress became referred to as a force and pressure constituting tension and deformation [11], it was also defined by Claude Bernard as corresponding to a force exerted and applied to an object. In the 19th century, this concept moved from the field of physical sciences to determine the opposing forces acting on an object to deform it, to a psychological and social conception. Since the twentieth century, the word stress has been associated with various disciplines: physics, psychoanalysis, psychology, psychiatry, psychosociology, immunology, and neurophysiology [12]. According to the World Health Organization, a person's state of health is determined by the balance of many personal, social, environmental, and economic factors [13][14]. Moreover, in the majority of societies, the conception of health is based on the transaction between the

individual and the environment [15]. Currently, stress and burnout are the subjects of scientific research and many studies have recently been conducted using a variety of methods and approaches that adopt many models and theories for dealing with stress.

3 Evolution of theoretical conceptions of stress

A brief inventory of the main theoretical models listed in the literature will show the evolution of the concept of stress and the factors that have led to its emergence. All the scientific approaches that have analyzed and explained stress have been based on the old models, the first of which was the stimulus-response model. It is the model that highlights the biological and physiological responses of the organism to a threatening situation [16]. The second approach is based on cause and effect, highlighting the effects of environmental stimuli on the well-being of the individual [17]. This is Karasek's « psychological demands/decision latitude » approach [18]. The third approach is based on the individual's psychological and environmental dimension, where the individual firstly assesses the event and secondly assesses his or her ability to adapt and adjust to cope with the event [19]. This is the transactional approach of Lazarus [3]. It is an approach that involves a set of factors related to the variability of the work environment as well as those of the individual. The transactional approach of Lazarus is the approach that will be used in this study.

4 Methods

4.1 Participants

This is a cross-sectional observational study [20], analytical and descriptive, carried out with the healthcare professionals of the Hassan II Oncology hospital - Oujda | Morocco.

4.2 Data collection

Data collection was conducted using a self-administered survey consisting of four sections:

- Socio-demographic, professional, and personal characteristics;
- The French version of the Perceived Stress Scale [12] was used to evaluate the extent to which life situations are often perceived as alarming. It is a validated measuring instrument [21] and has been the subject of numerous scientific research studies thanks to its satisfactory psychometric qualities. The version used in our study is the 10-item PSS, which is considered the best for assessing stress. The PSS result is a score expressed on a 5-point scale (never, rarely, sometimes, fairly often, and very often): Higher scores indicated a higher level of perceived stress.
- The use of different adjustment processes in the face of a threatening or stressful situation has been evaluated using the validated French version of Cousson's Ways

of Coping Checklist WCC [22]–[24], which measures the coping or adjustment strategies implemented in the face of a stressful event. It proposes a three-dimensional structure that examines 27 items and is composed of three main axes: Problem-focused coping (10 items) is all the efforts made to deal with the situation; Emotion-focused coping (9 items) is all the attempts made to control the emotional tension induced by the situation; 8 items are used to measure seeking social support. The construction of the scores is based on the sum of the answers to each item, with the subject answering on a 4-point scale (no, rather no, rather yes, yes). Respondents in this section were asked to think of a recent event that particularly upset and troubled them.

4.3 Statistical analysis

The data were verified, processed using IPM-SPSS software. Fisher's exact test was used to determine potential associations with stress. The Student's t-test was used to compare the means values for coping processes for the total sample and to explore differences between nurses.

5 Findings of the survey

5.1 Population characteristics

In this study, 30 nurses out of a total of 53 were included. The population consists of 17 women and 13 men. Married nurses have a lower proportion than their single counterparts, where the proportion of married nurses is 30.3%. the oldest age is 51, and the youngest is 21 (29 ± 5.85). No member of the study sample suffered from chronic diseases.

5.2 Perceived Stress Scale

The PSS revealed that the participating nurses, know how to cope with stress, but there are several situations that they do not know how to handle (30.66 ± 6.53). The minimum score on the PSS scale is 19, which means that this member knows how to manage stress. On the other hand, the maximum score is 46, which may mean that this member sometimes experiences a feeling of helplessness that leads to psychological disturbances. It is possible to overcome this feeling of powerlessness to achieve concrete goals in life by learning effective coping strategies. The index calculated by Cronbach's alpha is very important for (α=0.79) (see Table. 1).

Table 1. Distribution of the population according to results of the PSS

PSS	Average	SD	Min	Max
Women	30.64	06.52	19.00	46.00
Man	30.69	06.79	20.00	42.00
Total	30.66	06.53	19.00	46.00

5.3 Ways of Coping Checklist

The averages for the coping processes are shown in Fig. 1. From a descriptive point of view, the summary of the Ways of Coping Checklist results in our sample is Problem-focused coping (28.93 ± 5.37) and Emotion-focused coping (27.86 ± 9.83), followed by coping focused on seeking social support (23.96 ± 8.05).

A Student's t-test involves making a comparison to explore differences between the nurses in our sample (see Table. 2). No significant differences were found.

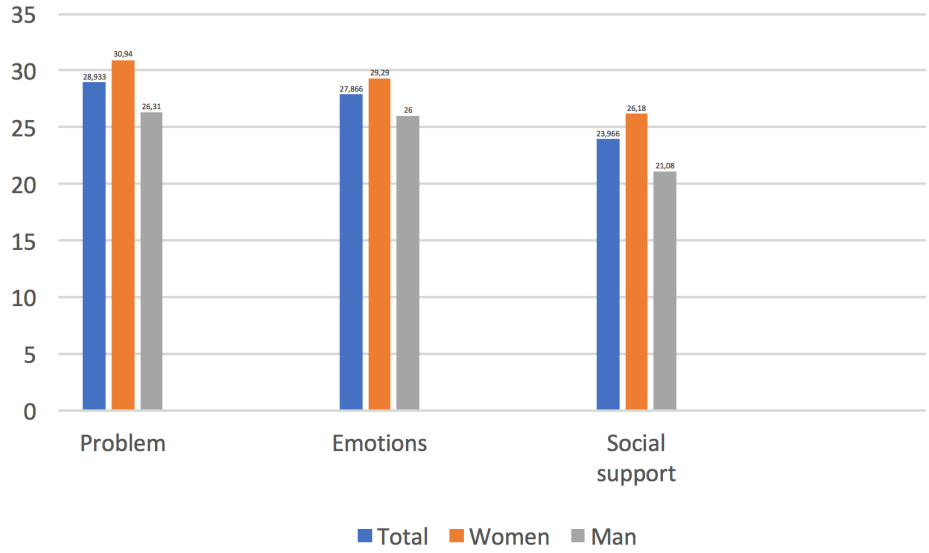

Fig. 1. Averages of coping processes for the total sample

Table 2. Averages and standard deviations over the three coping processes

WCC	Problem		Emotion		Social support	
	Average	SD	Average	SD	Average	SD
Total	28.93	05.37	27.86	09.83	23.96	08.05
Women	30.94	05.12	29.29	12.00	26.18	09.32
Man	26.31	04.64	26.00	05.90	21.08	01.38

To examine the frequency of use of specific coping processes, nurses' responses to each WCC item were categorized as a dichotomous variable (no, rather no, rather yes, yes). Table. 3 presents the items with the percentages of « yes » responses for the total sample of nurses. The frequency of « yes » responses for each item was then compared by gender using the Fisher Exact Test. Items 6 (p=0.05); 11 (p=0.01); 13 (p=0.02) and 19 (p=0.05) representing significant thresholds for which more female nurses responded that they use using coping processes to deal with a threatening situation.

Table 3. Comparison of frequency (%) of responses (yes) to WCC items among nurses using Fisher's Exact Test

		Total		Women		Man		
		n	***%***	***n***	***%***	***n***	***%***	***p***
1	Made a plan of action and followed it (PFC)	3	10%	2	12%	1	8%	0.87
2	Wished the situation would go away or somehow be finished (EFC)	16	57%	10	68%	6	46%	0.42
3	Talked to someone about how I was feeling (SS)	14	47%	9	53%	5	38%	0.13
4	Stood my ground and fought for what I wanted (PFC)	11	37%	8	47%	3	23%	0.58
5	Wished that I could change what had happened (EFC)	19	63%	12	71%	7	54%	0.47
6	Got professional help and did what they recommended (SS)*	12	40%	10	59%	2	15%	0.05
7	Changed or grew as a person in a good way (PFC)	10	33%	7	41%	3	23%	0.42
8	Felt bad that I couldn't avoid the problem (EFC)	13	43%	7	41%	6	46%	0.26
9	Asked someone I respected for advice and followed (SS)	13	43%	8	47%	5	38%	0.86
10	Just took things one step at a time (PFC)	17	57%	11	65%	6	46%	0.63
11	Hoped a miracle would happen (EFC)*	11	37%	10	59%	1	8%	0.01
12	Talked to someone to find out about the situation (SS)	12	40%	8	47%	4	31%	0.65
13	Concentrated on something good that could come out of the whole thing (PFC)*	14	47%	11	65%	3	23%	0.02
14	Blamed myself (EFC)	8	27%	4	24%	4	31%	0.45
15	Kept my feelings to myself (SS)	9	20%	5	24%	4	15%	0.95
16	Came out of the experience better than when I went (PFC)	6	23%	4	29%	2	15%	0.36
17	Thought about fantastic or unreal things that made me feel better (EFC)	6	20%	5	29%	1	8%	0.54
18	Talked to someone who could do something about the problem (SS)	9	30%	6	35%	3	23%	0.95
19	Changed something so things would turn out all right (PFC)*	9	30%	8	47%	1	8%	0.05
20	Tried to forget the whole thing (EFC)	13	43%	8	47%	5	38%	0.63
21	Tried not to burn my bridges behind me, but left things open somewhat (SS)	14	47%	7	41%	7	54%	0.93
22	Tried not to act too hastily or follow my hunch (PFC)	15	50%	10	59%	5	38%	0.33
23	Wished I could change the way that I felt (EFC)	18	60%	11	65%	7	54%	0.92
24	Accepted sympathy and understanding from someone (SS)	17	57%	12	71%	5	38%	0.19
25	Came up with a couple of different solutions to the problem (PFC)	10	33%	7	41%	3	23%	0.80
26	Criticized or lectured myself (EFC)	7	23%	3	18%	4	31%	0.37
27	I know what had to be done, so I doubled my efforts and tried harder to make things work (PFC)	9	30%	6	35%	3	23%	0.48

Problem-focused coping (PFC); Emotion-focused coping (EFC); Social support (SS); *P <= 0.05

5.4 Stress and population characteristics

No significant association was found between the Perceived Stress Scale score and the population characteristics at the threshold of (p=0.05) with the Fisher Exact Test.

5.5 Stress and coping strategies

Correlation analyses were carried out between stress levels (low, moderate, and high) and coping processes (problem-focused coping, emotion-focused coping, and social support-seeking coping) (see Table. 4). Results indicate that nurses with high stress levels tend to use more coping focused on seeking social support; on the other hand, nurses with low and moderate stress are more likely to adopt a problem-focused coping strategy.

Table 4. Correlation matrix between PSS and WCC

PSS	Problem-focused coping	Emotion-focused coping	Social support
High Stress	-0.06	0.59	0.79
Low Stress	0.65	0.55	0.41

6 Related works

The objective of this study was to assess the prevalence of stress among healthcare professionals and to study the coping strategies of the nursing staff.

The results show that the study population is susceptible to stress, which is similar to those found in a study of the nursing staff of a psychiatry department in Tunisia [25] and also to a study in France among nurses at the Gares et Connexions SNCF establishment [26]. The prevalence of stress between women and men was not significantly different. This result is in agreement with the study by Canouï and Mauranges [27] who did not find a direct link between socio-demographic variables and the job stress score. No socio-demographic or personal characteristics appear to be related to stress, which deserves to be identified and analyzed by another more in-depth study.

The Ways of Coping Checklist results indicate that the process most frequently reported in our study for coping with stress is Problem-focused coping, which is similar to those found in a study on coping of the emergency care relationship [28], and the study, ways of coping with stress among nursing students in Turkey, which has been successful in increasing students' ability to cope with stress by problem-focused coping and decreasing students' ability to cope with stress by emotion-focused coping [29]. Our research study also found that nurses with higher levels of stress tended to use more social support-seeking coping, whereas nurses with moderate or low levels of stress tended to use more problem-focused coping.

Recent work on occupational stress proposed the introduction of an interactive tool to cope with stress [30], It is a mobile application that raises awareness among health professionals about stress, thus offering a psychological support service for patients in need. It is a topical approach for coping with stress. This approach is based on the use

of information and communication technologies (see Fig. 2), it plays an important role in facilitating communication between health professionals and patients [31]–[35].

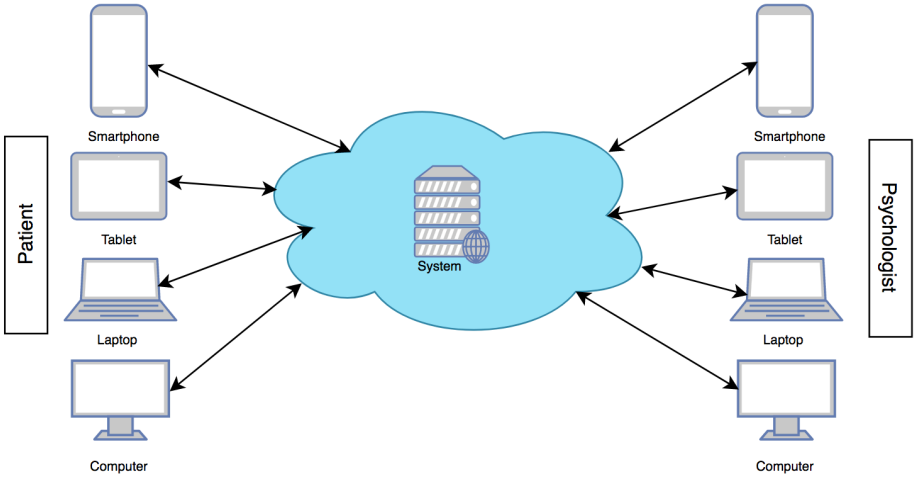

Fig. 2. Communication network architecture [35]

Another research tried to set up a mobile application to monitor stress levels using a questionnaire [36]. It is very interesting to control stress using a questionnaire developed on a mobile platform. Moreover, stress is defined as a biological response of the human organism to a threat, so it is also very important to take into account physiological parameters to cope with stress.

7 Conclusion and future works

The results state that the study population is susceptible to stress. The results raise questions about the importance of coping strategies. As hypotheses: No socio-demographic or personal variables appear to be related to stress; Nurses with higher stress tend to use more coping focused on seeking social support. Coping focused on problem-solving is highly recommended for coping with stress. Awareness-raising is highly desirable to ensure primary prevention against stress.

The next step in our research work could also focus on the use of new information and communication technologies to cope with stress; more specifically, the use of mobile technology could help us to raise awareness about the impact of stress in daily life, and also put in place effective prevention measures. The digitization of stress assessment procedures will allow us to facilitate the measurement method and have more results that are reliable on the physiological and psychological health of the person. In future work, we propose the implementation of a digital prevention tool using Arduino technology. The development of an intelligent wearable smart bracelet

and mobile recommendation system based on the medical internet of things is the main objective of future work to cope with stress.

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9 Authors

Mohammed Amine Lafraxo is a Ph.D. student in Education and Health Informatics, at the Laboratory of Biology and Health at the Faculty of Sciences, Ibn Tofail University. He has a Master's degree in educational technology from the "École Normale Supérieure, ENS" of Martil, Morocco, awarded in 2016, and two bachelor's degrees in computer engineering and medical informatics. His current research focuses on E-learning, Software Engineering, Big Data, Biometry, Epidemiology, Public Health, Stress, and Burnout Syndrome.

Mohammed Ouadoud is a Muslim man from Morocco. He is a Ph.D. Research Scholar in Computer sciences, at the Laboratory of the Information System and Software Engineering (SIGL) at National School of Applied Sciences, Abdelmalek Essaâdi University, Tetouan, Morocco. In 2018, he completed his Ph.D. thesis in computer science at the faculty of science of Tetouan, Morocco. His dissertation research focuses on Modeling and Prototyping a Learning Management System Based on the IMD-LD, the NoSQL, and the Hybridization between Learning Theories. He has a Master's degree in instructional design multimedia engineering from the École Normale Supérieure of Martil, Morocco in 2013. His current research focuses on E-learning, Software Engineering, Geomatics, Public Health, and Bigdata. He is a reviewer in several international journals (email: mohammed.ouadoud@gmail.com).

Youssef El Madhi is a Ph.D. Research Scholar in Biology and Health. He is with the Research Laboratory for Education, Environment and Health, CRMEF Rabat, Morocco (email: youssmad@yahoo.fr).

Abdelmajid Soulaymani is a Professor of Higher Education in Genetics and Biostatistics since 1986 - Vice Dean of the Faculty of Science at Ibn Tofail University, Morocco. Director of the Center for Doctoral Studies in Science and Technology from 2014 to 2019 - Director of the Laboratory of Genetics and Biometrics. (email: soulaymani@uit.ac.ma).

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