A Longitudinal Study on Nurses' Emotional Exhaustion Assessment in Taiwan

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Abstract— Long-term burnout can lead to negative results including tension and fatigue, loss of confidence and responsibility in work, and decreased work efficiency. Assessing nurses' emotional exhaustion from a longitudinal viewpoint enables hospital management to track nurses' degree of burnout and trends on a timely basis in order to reduce their fatigue. This study uses the internal data sets from 2014 to 2020 in a regional teaching hospital in Taiwan based on the emotional exhaustion dimension of the Chinese version of the safety attitudes questionnaire to evaluate nurses' emotional exhaustion. The results highlight that age, supervisor/manager, and experience in organization are critical demographic variables to influence nurses' emotional exhaustion in this regional teaching hospital from a longitudinal viewpoint. The question, "I feel I'm working too hard on my job", is the most critical question in the emotional exhaustion dimension that can be the target for hospital management to reduce nurses' burnout in the hospital.

Index Terms— emotional exhaustion, nurse, Chinese version of the safety attitudes questionnaire, longitudinal data, regional teaching hospital

I. INTRODUCTION

The concept of burnout was initially put forward by American clinical psychologist Freudenberger in occupational stress research in 1974 [1]. It refers to the negative psychological reaction, violent emotion, indifferent attitude, and impatient service caused by individuals' inability to effectively deal with all kinds of continuous pressure at work in people-serving industries [1]. Emotional exhaustion is also often regarded as the main component of burnout, which represents to a fatigue state of excessive emotional need and exhaustion of energy that occurs during interpersonal interaction [2-4]. Studies have pointed out that long-term burnout can lead to negative results such as tension and fatigue, loss of confidence and responsibility in work, and decreased work efficiency [5-7].

In the process of medical services, nurses who most often contact patients play multiple important roles [8,9]. They not only provide health consultation and guidance services for patients but also act as communicators in the process of treatment among patients, family members, and physicians [10-13]. Nurses' attitudes toward patient safety is a result of all other contributory features of the working environment and might indicate if the safety culture and quality of healthcare are positive [14,15]. De Oliveira [16] proposed that nurses' emotional exhaustion is a highly valued issue because it is related to not only the quality of patient safety but also nurses' physical and mental status [17,18]. Nurses with better emotional regulations can reduce emotional exhaustion and in turn improve effective patient care [19,20].

Huang et al. [21] and Wu et al. [22] pointed out that nurses with good emotional state can ensure the smooth implementation of nursing work and improve the nurse-patient relationship and patient satisfaction. On the other hand, by investigating the relationship between nurses' burnout, patients, and organizational outcomes, Jun et al. [18] concluded that a high level of nurses' emotional exhaustion is related to unsafe nursing quality, patient dissatisfaction, and nurses' lack of identity and work inefficiency. Cimiotti et al. [23] pointed out that nurses' emotional exhaustion results in a higher infection rate and a poor patient care quality. With more and more evidence highlighting the adverse consequences of emotional exhaustion on medical staff, patients, and healthcare organizations, it is imperative to examine nurses' emotional exhaustion in the medical system.

Among the existing research on job burnout, the Maslach Burnout Inventory–Human Services Survey (MBI-HSS) compiled by Maslach and Jackson in 1981 is the most widely used instrument in the research of nurse burnout. In their model, Maslach and Jackson [2] defined job burnout as an individual's emotional response in the field of human service, which is divided into three dimensions: emotional exhaustion, depersonalization, and diminished personal accomplishment. Emotional exhaustion refers to the extreme emotional fatigue, energy loss, and exhaustion caused by the strong pressure of work, and the continuous sense of frustration and tension in the job. Depersonalization refers to an individual's indifference and negative attitude towards work and life. Diminished personal accomplishment shows that individuals are incompetent or underestimate the value of their work, are not interested in their work, and even think that their current work is an obstacle to their career development [2].

Ibtissam et al. [24] stated that job burnout is particularly prominent and serious among nurses in private and public hospitals. More specifically, emotional exhaustion has proven to be higher in married nurses. Depersonalization was highest among nurses in the private sector, and personal

accomplishment was highest among nurses in the public sector. Night and rotating shift nurses had significantly higher depersonalization. Lee et al. [25] used a Chinese version of MBI-HSS to assess hospital staff's burnout in Taiwan and concluded that physicians and nurses perceived different emotional exhaustion in terms of supervisor/manager, job position, age, experience in organization, and experience in position. Marques et al. [26] investigated burnout in health professionals and found that compared to physicians and healthcare assistants, high levels of burnout due to emotional exhaustion and lack of personal accomplishment were observed in nurses, administrative staff, and technicians.

Studies conducted in healthcare organizations have commonly illustrated high levels of emotional exhaustion among nurses [27-29]. According to the report of the Ministry of Health and Welfare [30], the average nurse-patient ratio of hospitals in Taiwan has reached 1:9, which is much worse than the international 1:6. The research conducted by Lin et al. [31] also reveals that overwork and burnout issues among nurses in Taiwan still generally exist, which could result in risky patient safety. The Joint Commission of Taiwan (JCT) developed the Chinese version of the safety attitudes questionnaire (CSAQ) based on Sexton et al.'s [32] SAQ to measure patient safety culture retrieved from hospital staff's physical and emotional well-being in hospitals in a yearly basis [21,33]. The SAQ developed by Sexton et al. [32] has six dimensions of patient safety culture, namely, teamwork climate, safety climate, perceptions of management, job satisfaction, stress recognition, and working conditions [34,35].

In 2007, the JCT designed the Chinese version of patient safety culture instrument (i.e., CSAQ) based on Sexton et al.'s [32] research [36]. After that, three supplementary dimensions (i.e., hospital management support for patient safety, teamwork across hospital units, and hospital handoffs and transitions) were added to assess the hospital level concerning patient safety issues. However, the previous versions of the CSAQ have not explicitly understood the effect of the emotional state of the medical staff on patient safety during medical encounters. In 2014, the JCT has modified the CSAQ by removing previous hospital-level dimensions and incorporating two new dimensions (emotional exhaustion and work-life balance) [17,37]. Emotional exhaustion with nine items was borrowed from the MBI-HSS, whereas work-life balance was measured with seven items. Accordingly, the newest CSAQ contains 46 questions into eight patient safety culture dimensions (see Huang et al. [17] and Chi et al. [37] for the full questionnaire).

At present, most of the studies are still cross-sectional and it is still rare to study nurses' emotional exhaustion in a longitudinal way [18]. One of the main advantages of a longitudinal study is the ability to track changes in behaviors in time difference [38]. Strangor [39] also demonstrated that a longitudinal study allows researchers to measure current beliefs and behaviors and assess how these beliefs and behaviors change in trends as well as to conduct a comparison between early and late behaviors. With that in mind, the purposes of this study are twofold. First, we aim to examine whether or not nurses' emotional exhaustion will vary according to different demographic variables, such as gender, age, job status, working experience, education, and patient contacts. Evaluating the potential factors affecting nurses' emotional exhaustion is more conducive to leveraging the recognition and discussion on the effects of burnout on nurses. Second, to the best of our knowledge, this is the first study designed to investigate the longitudinal associations between nurses' emotional exhaustion and their demographic variables in the trend for hospitals in Taiwan. Examining the association of nurses' emotional exhaustion and demographic variables from a longitudinal perspective may provide new information for improving nurses' emotional and physical well-being efficiently.

II. RESEARCH METHOD

This research uses a retrospective study to identify critical demographic variable(s) that affect nurses' emotional exhaustion in terms of individual questions and then observe how essential factors change from year to year. This study was approved by the Institutional Review Board of the case hospital. The internal data sets from 2014 to 2020 regularly conducted in October-November by a regional teaching hospital in Taiwan based on the emotional exhaustion dimension of the CSAQ are used. The effective numbers of the questionnaire from 2014 to 2020 in the emotional exhaustion dimension for nurses are 381, 347, 398, 476, 450, 479, and 438, respectively.

There are nine questions in the emotional exhaustion dimension of the CSAQ including: Q1: I feel like I'm at the end of my rope; Q2: I feel burned out from my work; Q3: I feel frustrated by my job; Q4: I feel I'm working too hard on my job; Q5: I feel emotionally drained from my work; Q6: I feel used up at the end of the workday; Q7: I feel fatigued when I get up in the morning and have to face another day on the job; Q8: Working with people all day is really a strain for me; and Q9: Working with people directly puts too much stress on me [37,40]. A 5-point Likert scale ranging from strongly disagree to strongly agree with the respective values of 1 to 5 is applied to each question. That is, a higher value for each question represents a higher degree of fatigue or burnout, indicating a poor recovery from emotional exhaustion.

There are ten demographic variables in the CSAQ including job position [37]. However, job position is removed because this study focuses on nurses solely. The detailed information about nurses in this case hospital from 2014 to 2020 are provided in Table I. Mann-Whitney U test for two independent samples test and one-way analysis of variance with $\alpha = 0.05$ are employed to individual questions in the emotional exhaustion dimension. Specifically, Mann-Whitney U test is used to assess if gender and supervisor/manager are critical variables to affect nurses' emotional exhaustion [33]. One-way analysis of variance can be applied to the rest of the demographic variables by finding critical variables affecting nurses' emotional exhaustion [40].

TABLE I
NURSES' DEMOGRAPHIC INFORMATION FROM 2014 TO 2020

Demographic Variable	Year 2014 Frequency (%)	Year 2015 Frequency (%)	Year 2016 Frequency (%)	Year 2017 Frequency (%)	Year 2018 Frequency (%)	Year 2019 Frequency (%)	Year 2020 Frequency (%)
Gender							
Male	12 (3.1)	19 (5.5)	14 (3.5)	25 (5.3)	24 (5.3)	30 (6.3)	34 (7.8)
Female	369 (96.9)	328 (94.5)	384 (96.5)	451 (94.7)	426 (94.7)	449 (93.7)	404 (92.2)
Age							
Less than 20	8 (2.1)	8 (2.3)	11 (2.8)	7 (1.5)	3 (0.7)	8 (1.7)	0 (0)
21-30	160 (42.0)	146 (42.1)	174 (43.7)	220 (46.2)	215 (47.8)	225 (47.0)	189 (43.2)
31-40	149 (39.1)	130 (37.5)	137 (34.4)	145 (30.5)	127 (28.2)	86 136 (28.4)	120 (27.4)
41-50	55 (14.4)	54 (15.6)	64 (16.1)	90 (18.9)	(19.1)	84 (17.5)	104 (23.7)
51-60	9 (2.4)	9 (2.6)	12 (3.0)	14 (2.9)	19 (4.2)	24 (5.0)	25 (5.7)
61 and above	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	2 (0.4)	0 (0)
Supervisor/Manager							
Yes	31 (8.1)	28 (8.1)	40 (10.1)	38 (8.0)	45 (10.0)	40 (8.4)	47 (10.7)
No	350 (91.9)	319 (91.9)	358 (89.9)	438 (92.0)	405 (90.0)	439 (91.6)	391 (89.3)
Respondents reporting events in the past 12 months							
No	198 (52.0)	217 (62.5)	234 (58.8)	292 (61.3)	260 (57.8)	286 (59.7)	264 (60.3)
1-5	169 (44.4)	114 (32.9)	155 (38.9)	174 (36.6)	175 (38.9)	176 (36.7)	160 (36.5)
6-10	12 (3.1)	14 (4.0)	7 (1.8)	4 (0.8)	13 (2.9)	13 (2.7)	9 (2.1)
11-15	0 (0)	2 (0.6)	2 (0.5)	6 (1.3)	0 (0)	2 (0.4)	2 (0.5)
More than 16	2 (0.5)	0 (0)	0 (0)	0 (0)	2 (0.4)	2 (0.4)	3 (0.7)
Job status							
Full time	334 (87.7)	313 (90.2)	358 (89.9)	433 (91.0)	407 (90.4)	447 (93.3)	420 (95.9)
Contract	20 (5.2)	11 (3.2)	14 (3.5)	14 (2.9)	18 (4.0)	13 (2.7)	11 (2.5)
Part time	7 (1.8)	6 (1.7)	5 (1.3)	6 (1.3)	6 (1.3)	3 (0.6)	0 (0)
Agency	20 (5.2)	17 (4.9)	21 (5.3)	23 (4.8)	19 (4.2)	16 (3.3)	7 (1.6)
Experience in organization							
Less than 6 month	42 (11.0)	58 (16.7)	51 (12.8)	49 (10.3)	40 (8.9)	52 (10.9)	17 (3.9)
6 to 11 months	15 (3.9)	10 (2.9)	39 (9.8)	16 (3.4)	21 (4.7)	35 (7.3)	3 (0.7)
1 to 2 years	65 (17.1)	53 (15.3)	71 (17.8)	128 (26.9)	101 (22.4)	85 (17.7)	79 (18.0)
3 to 4 years	62 (16.3)	48 (13.8)	48 (12.1)	67 (14.1)	67 (14.9)	78 (16.3)	82 (18.7)
5 to 10 years	90 (23.6)	79 (22.8)	86 (21.6)	95 (20.0)	96 (21.3)	100 (20.9)	121 (27.6)
11 to 20 years	96 (25.2)	90 (25.9)	90 (22.6)	104 (21.8)	102 (22.7)	93 (19.4)	87 (19.9)
21 years or more	11 (2.9)	9 (2.6)	13 (3.3)	17 (3.6)	23 (5.1)	36 (7.5)	49 (11.2)
Experience in position							
Less than 6 month	56 (14.7)	65 (18.7)	62 (15.6)	51 (10.7)	49 (10.9)	61 (12.7)	21 (4.8)
6 to 11 months	16 (4.2)	11 (3.2)	40 (10.1)	24 (5.0)	27 (6.0)	39 (8.1)	9 (2.1)
1 to 2 years	69 (18.1)	59 (17.0)	77 (19.3)	135 (28.4)	108 (24.0)	98 (20.5)	94 (21.5)
3 to 4 years	66 (17.3)	57 (16.4)	57 (14.3)	77 (16.2)	70 (15.6)	78 (16.3)	88 (20.1)
5 to 10 years	100 (26.2)	93 (26.8)	94 (23.6)	104 (21.8)	104 (23.1)	107 (22.3)	117 (26.7)
11 to 20 years	71 (18.6)	59 (17.0)	63 (15.8)	80 (16.8)	79 (17.6)	75 (15.7)	80 (18.3)
21 years or more	3 (0.8)	3 (0.9)	5 (1.3)	5 (1.1)	13 (2.9)	21 (4.4)	29 (6.6)
Education							
Junior high school and below	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	2 (0.4)	0 (0)
Senior high school	4 (1.0)	0 (0)	5 (1.3)	4 (0.8)	4 (0.9)	7 (1.5)	3 (0.7)
College/University	363 (95.3)	336 (96.8)	377 (94.7)	456 (95.8)	433 (96.2)	460 (96.0)	420 (95.9)
Graduate school and above	14 (3.7)	11 (3.2)	16 (4.0)	16 (3.4)	13 (2.9)	10 (2.1)	15 (3.4)
Direct patient contact							
No	7 (1.8)	13 (3.7)	16 (4.0)	11 (2.3)	8 (1.8)	8 (1.7)	12 (2.7)
Rare	25 (6.6)	20 (5.8)	27 (6.8)	30 (6.3)	29 (6.4)	39 (8.1)	30 (6.8)
Very often	349 (91.6)	314 (90.5)	355 (89.2)	435 (91.4)	413 (91.8)	432 (90.2)	396 (90.4)

III. RESULTS

Table II summarizes the mean scores of nurses' emotional exhaustion for each individual question from 2014 to 2020. In addition, Figure 1 depicts the mean scores from 2014 to 2020 for each individual question. A higher score indicates nurses have poor emotional exhaustion, indicating a higher degree of burnout or fatigue. That is, nurses do not have good recovery from emotional exhaustion. In general, the mean scores in Questions 1 (I feel like I'm at the end of my rope), 3 (I feel frustrated by my job), 8 (Working with people all day is really a strain for me), and 9 (Working with people directly puts too much stress on me) decrease as time goes by. Specifically, the mean scores in Questions 8 and 9 have been decreased drastically and become stable from 2016 to 2020 compared with those in 2014 and 2015. That is, nurses have relatively better emotional exhaustion. In contrast, the mean scores in Questions 2 (I feel burned out from my work), 4 (I feel I'm working too hard on my job), 5 (I feel emotionally drained from my work), 6 (I feel used up at the end of the workday), and 7 (I feel fatigued when I get up in the morning and have to face another day on the job) tend to be increased from year to year in general. Specifically, nurses feel slightly better in Questions 2, 5, and 7 in 2020 though they feel more stressful from 2016 to 2019 generally. Moreover, the mean scores in Questions 4 and 6 have been increased and then become relatively stable from 2016 to 2020. It is worth to note that the gap in Question 6 is the largest. In fact, the mean scores in Question 6 are the highest from 2016 to 2020 among nine questions showing nurses might feel burnout at the end of the workdays five years in a row. This signal should not be

ignored but should be paid much attention and monitored by hospital management because it could significantly influence the patient safety and care in this hospital. In practice, interventions are required to remove the scenario to reduce nurses' burnout.

TABLE II
NURSES' EMOTIONAL EXHAUSTION SCORES FROM 2014 TO 2020

| Question	2014	2015	2016	2017	2018	2019	2020	Post hoc results
Q1: I feel like I'm at the end of my rope	3.08	3.11	2.82	2.88	2.79	2.82	2.72	2014 > 2016; 2014 > 2017; 2014 > 2018; 2014 > 2019; 2014 > 2020; 2015 > 2016; 2015 > 2017; 2015 > 2018; 2015 > 2019; 2015 > 2020
Q2: I feel burned out from my work	2.76	2.71	3.19	3.20	3.20	3.21	3.08	2016 > 2014; 2016 > 2015; 2017 > 2014; 2017 > 2015; 2018 > 2014; 2018 > 2015; 2019 > 2014; 2019 > 2015; 2020 > 2014; 2020 > 2015
Q3: I feel frustrated by my job	3.04	3.07	2.85	2.81	2.82	2.81	2.71	2014 > 2017; 2014 > 2018; 2014 > 2018; 2014 > 2020; 2015 > 2016; 2015 > 2017; 2015 > 2018; 2015 > 2019; 2015 > 2020
Q4: I feel I'm working too hard on my job	2.64	2.71	3.29	3.29	3.30	3.27	3.29	2016 > 2014; 2016 > 2015; 2017 > 2014; 2017 > 2015; 2018 > 2014; 2018 > 2015; 2019 > 2014; 2019 > 2015; 2020 > 2014; 2020 > 2015
Q5: I feel emotionally drained from my work	2.76	2.76	3.16	3.29	3.22	3.20	3.01	2016 > 2014; 2016 > 2015; 2017 > 2014; 2017 > 2015; 2018 > 2014; 2018 > 2015; 2019 > 2014; 2019 > 2015; 2020 > 2014; 2020 > 2015; 2017 > 2020; 2018 > 2020
Q6: I feel used up at the end of the workday	2.45	2.46	3.37	3.54	3.43	3.46	3.28	2016 > 2014; 2016 > 2015; 2017 > 2014; 2017 > 2015; 2018 > 2014; 2018 > 2015; 2019 > 2014; 2019 > 2015; 2020 > 2014; 2020 > 2015; 2017 > 2020
Q7: I feel fatigued when I get up in the morning and have to face another day on the job	2.79	2.85	3.04	3.13	3.14	3.14	2.98	2016 > 2014; 2017 > 2014; 2017 > 2015; 2018 > 2014; 2018 > 2015; 2019 > 2014; 2019 > 2015
Q8: Working with people all day is really a strain for me	3.30	3.37	2.61	2.67	2.66	2.66	2.57	2014 > 2016; 2014 > 2017; 2014 > 2018; 2014 > 2019; 2014 > 2020; 2015 > 2016; 2015 > 2017; 2015 > 2018; 2015 > 2019; 2015 > 2020
Q9: Working with people directly puts too much stress on me	3.39	3.44	2.48	2.54	2.51	2.54	2.46	2014 > 2016; 2014 > 2017; 2014 > 2018; 2014 > 2019; 2014 > 2020; 2015 > 2016; 2015 > 2017; 2015 > 2018; 2015 > 2019; 2015 > 2020
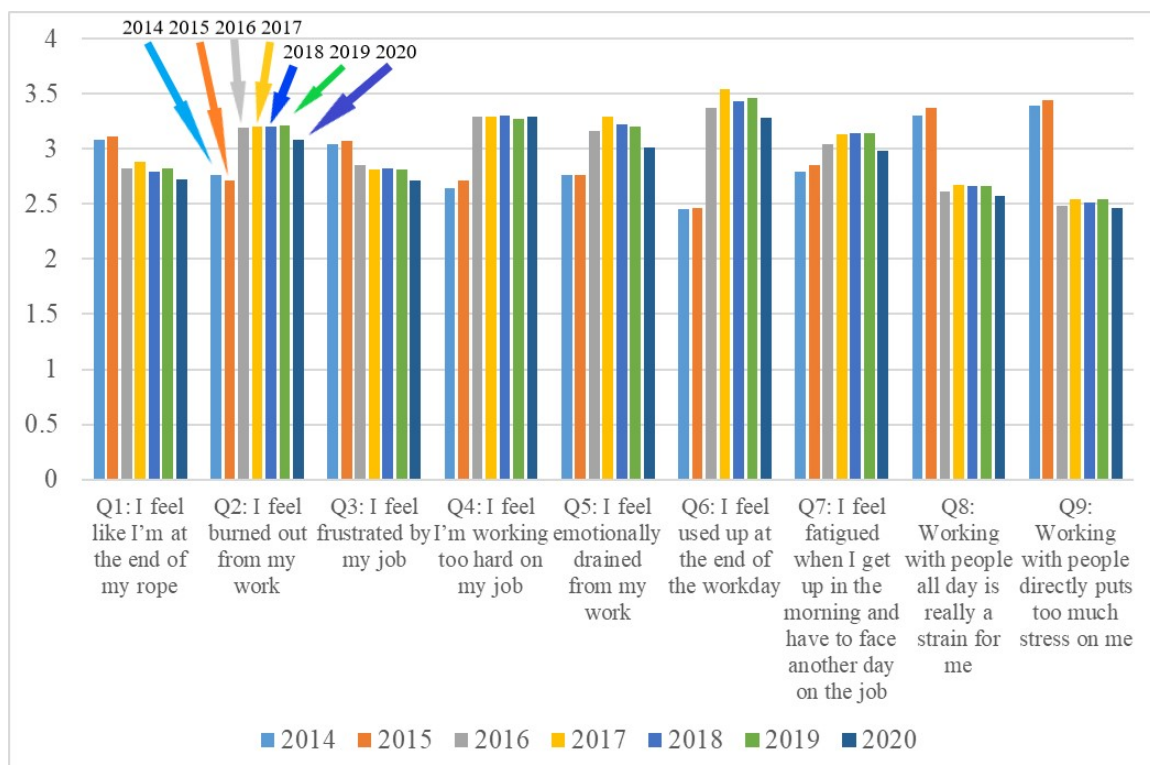
Fig. 1 The mean scores from 2014 to 2020 for each individual question

Table III provides a comprehensive table to depict the relationship between nurses' demographic variables and individual questions of the emotional exhaustion dimension from 2014 to 2020. An asterisk (*) is placed to show if there is a statistical significance. That is, the more asterisks a particular demographic variable receives, the more important influence on nurses' emotional exhaustion that variable has. Moreover, the more asterisks a particular question has, the more attention should be paid by hospital management, indicating that scenario might be the reason to increase nurses' burnout.

Gender is not a critical variable to influence nurses' emotional exhaustion from a longitudinal viewpoint. Supervisor/manager, on the other hand, is a critical variable to influence Questions 4 (I feel I'm working too hard on my job), 8 (Working with people all day is really a strain for me), and 9 (Working with people directly puts too much stress on me) from 2014 to 2020 except for Questions 8 and 9 in 2018. The findings support that education and direct patient contact are not critical variables to influence nurses' emotional exhaustion generally. The variable of respondents reporting events in the past 12 months is essential to impact nurses' emotional exhaustion in 2020. Besides, this variable influences Question 4 in 5 of 7 years significantly. Job status impacts nurses' emotional exhaustion in 2018 in 7 out of 9 questions. Finally, experience in organization and experience in position show similar patterns. Both variables have a significant impact on Question 4.

By counting the frequencies of asterisks, age, supervisor/manager, and experience in organization are the critical demographic variables to affect nurses' emotional exhaustion from a longitudinal viewpoint. In contrast, education, gender, and direct patient contacts are the least important demographic variables to influence nurses' emotional exhaustion. On the other hand, Question 4 (I feel I'm working too hard on my job) has been influenced by several demographic variables including age, supervisor/manager, respondents reporting events in the past 12 months, experience in organization, and experience in position from a longitudinal viewpoint.

IV. DISCUSSION

Three studies have been found to use the emotional exhaustion dimension from the CSAQ in the past. Lee et al. [41] conducted a cross-sectional study by using the data in 2014 from the emotional exhaustion dimension of the CSAQ in a regional teaching hospital in Taiwan and then employed cluster analysis to identify medical staff with high burnout. The employees who are in a higher degree of burnout are identified, hospital management can track of medical staffs' fatigue conditions and provide timely assistance.

Lee et al. [25] also conducted a cross-sectional study by using the internal surveyed data in 2014 based on the CSAQ from a regional teaching hospital in Taiwan to evaluate whether or not physicians and nurses with different demographic variables perceive emotional exhaustion based on nine individual questions differently. Their results showed that supervisor/manager, job position, age, experience in organization, and experience in position are the variables to influence at least one of nine questions in the emotional exhaustion dimension. Though age is the most critical important variable, only four out of nine questions have been influenced. On the other hand, Question 4 (I feel I'm working too hard on my job), Question 8 (Working with people all day is really a strain for me), and Question 9 (Working with people directly puts too much stress on me) are the three questions that have been affected by the most demographic variables, i.e., four of nine demographic variables.

Lee et al. [42] conducted a cross-sectional study to assess how all of medical staff perceived emotional exhaustion in a medical center in Taiwan in 2017. The results showed that female employees and employees who are not supervisors/managers tend to have higher burnout. Employees whose ages are 21-30, 31-40, and 41-50 years also have a higher degree of fatigue. Moreover, nurses are more stressful than the others in this medical center.

The above studies were cross-sectional researches by using one-year data to perform analysis and focused on either all of medical staff or physicians and nurses. However, no detailed information about nurses' burnout has been assessed. In general, nurses face a variety of challenges during work time, such as high time pressure, multi-tasking, and staffing shortages in Taiwan [14]. It is essentially important to monitor the degree of nurses' burnout to reduce nurses' shortage problem. In addition, using a longitudinal study to assess emotional exhaustion from nurses' viewpoints enables hospital management to trace the performance and trends in a timely basis. No any longitudinal studies have been found previously. Therefore, this research is a pioneer study to explore nurses' perceptions in emotional exhaustion through a case study based upon a regional teaching hospital in Taiwan to figure out their degree of fatigue from a longitudinal viewpoint.

Though age, supervisor/manager, and experience in organization are critical demographic variables to influence nurses' emotional exhaustion, Question 4 (I feel I'm working too hard on my job) is the most influenced question among nine questions in the emotional exhaustion dimension. Through a longitudinal viewpoint, hospital management would be able to observe how each demographic variable influences each question from year to year. Therefore, the relationships depicted in Table II provide a clear description to show how hospital management can initiate any activities to reduce nurses' degree of fatigue from a longitudinal viewpoint effectively.

V. CONCLUSIONS

Evaluating nurses' emotional exhaustion can monitor the degree of nurses' burnout so as to reduce the infection rate and enhance patient care quality. In addition, conducting a longitudinal study to evaluate nurses' emotional exhaustion enables hospital management to track the degree of burnout and trends in a timely basis. This study shows that age, supervisor/manager, and experience in organization are the three critical demographic variables to influence nurses' emotional exhaustion in this regional teaching hospital in Taiwan. Moreover, Q4 (I feel I'm working too hard on my job) is the most affected question among nine questions in the

emotional exhaustion dimension. To reduce nurses' burnout, hospital management can pay attention to the combinations of three demographic variables and Question 4.

TABLE III
THE RELATIONSHIP BETWEEN DEMOGRAPHIC VARIABLES AND WORK-LIFE BALANCE IN DIFFERENT YEARS

Demographic	Year	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9
Gender	2014									
	2015									
	2016									
	2017									
	2018			*						
	2019									
	2020				*					
Age	2014				*				*	*
	2015				*			*	*	*
	2016			*	*		*	*	*	*
	2017				*			*		
	2018				*			*		
	2019	*	*		*		*	*	*	
	2020	*	*	*		*	*	*	*	*
Supervisor/ Manager	2014				*				*	*
	2015				*				*	*
	2016				*				*	*
	2017				*				*	*
	2018				*					
	2019				*				*	*
	2020				*				*	*
Respondents reporting events in the past 12 months	2014					*				
	2015				*					
	2016							*		
	2017				*					
	2018		*		*		*			
	2019				*					
	2020	*	*	*	*	*	*	*		
Job status	2014									
	2015									
	2016				*					
	2017				*					
	2018	*	*	*	*		*	*		*
	2019									
	2020									
Experience in organization	2014				*				*	*
	2015		*		*			*	*	*
	2016	*			*					
	2017	*	*		*	*	*	*		
	2018				*					
	2019				*				*	
	2020				*					
Experience in position	2014				*				*	*
	2015		*		*					
	2016				*					
	2017		*		*	*				
	2018				*					
	2019				*			*		
	2020									
Education	2014									
	2015				*					
	2016									
	2017									
	2018									
	2019									
	2020									
Direct patient contacts	2014									
	2015									
	2016				*					
	2017									
	2018		*			*	*			
	2019									
	2020						*			
Total count		6	10	5	37	6	9	12	15	14

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