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Relationship between Cigarette Smoking and Anxiety Level among Nurses

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ABSTRACT

Background: This study aims to determine whether cigarette smoking and anxiety degrees are related among nurses. **Methods:** A correlation design study was conducted at Baquba Teaching Hospital in Diyala Governorate, and the study period extended from September 10th, 2023, to January 28th, 2024. A nonprobability purposive sample was used to include 200 nurses working at Baquba Teaching Hospital, Iraq. Data were collected using a self-administered questionnaire from January 10th to February 7th, 2024. There were two components to the study instruments. Initially, the demographic sheet contained the individuals' sociodemographic data. The Taylor manifest anxiety scale is included in the second section. The collected data were analyzed using SPSS version 26. **Results:** Findings of the current study showed that 47.5% of nurses had a moderate level of anxiety, while 35.5% experienced a small level of anxiety, and 17.0% suffered from a severe level of anxiety regarding smoking cigarettes. The nonparametric correlation analysis (Spearman's rho) carried out to examine the relationship between cigarette smoking and anxiety levels among nurses yielded a significant correlation coefficient of 0.01 ($p > 0.05$). The findings revealed a strong and positive correlation between all aspects related to cigarette smoking and anxiety levels. **Conclusion:** According to the results of the present study, it concluded that nurses reported moderate levels of anxiety, and it was displayed that there was a relationship between nurses' anxiety levels and cigarette smoking depending on their age groups and length of hospital employment. **Recommendation:** It is recommended that training and educational programs be implemented to cultivate a suitable health promotion culture among nurses, thereby enabling them to offer more effective support to patients who smoke.

Keywords: Anxiety; Cigarette Smoking; Habit; Nurses

INTRODUCTION

Anxiety is a prevalent mental disorder in Western societies and is a leading cause of disability, resulting in significant individual and societal costs. Most of the adult smokers initiate regular smoking before the age of 18 years old. Anxiety often coexists with diverse medical conditions, exacerbating symptoms, impeding recovery, and elevating the risk of developing other mental disorders such as alcoholism and depression. Even when anxiety symptoms do not meet the criteria for a diagnosed disorder, they can still negatively impact overall well-being and health. Nurses constitute the largest healthcare profession globally, with approximately 27 million individuals serving in nursing and midwifery roles, accounting for nearly 50% of the global health workforce (WHO, 2024). Moreover, there is evidence indicating that behavioral support provided by nurses to motivate and sustain smoking cessation can significantly increase long-term abstinence rates (Rice *et al*., 2017; Tarigan, Panduragan, & Said, 2023). Smoking and anxiety have a complex relationship. However, the connection between smoking and anxiety is not so straightforward. In the long term, smoking can actually increase anxiety and stress levels (Mental Health Awareness Week UK, 2023). Zakiyah *et al.* (2023) conducted a study aiming to explore the association between stress levels and smoking

behavior. Smoking, known to be detrimental to health and a risk factor for divergent serious diseases, is often claimed by smokers as a coping mechanism for stress. In a study involving Spanish health professionals, the prevalence of smoking among physicians and nurses was reported to be 11.8% and 12.8%, respectively (Sanmartín *et al.*, 2019). Suyamti and Hastuti (2018) defined anxiety as a psychological state characterized by physical tension, apprehension about the future, and a negative perception of oneself and the environment. It was a common reaction experienced by individuals in disparate situations, influenced by its duration and how individuals coped with it (Suyamti & Hastuti, 2018). examined the link between stress levels and smoking behavior, revealing a significant association. Higher stress levels were found to be correlated with heavier smoking behavior, with a percentage of 37.7%. Individuals with mental health conditions were more likely to smoke heavily and exhibit a high dependence on cigarettes (Richardson, McNeill, & Brose, 2019). Smoking significantly contributes to the disparity in life expectancy between individuals with and without mental health conditions (Chesney *et al.*, 2021). Smoking cessation is expected to have positive impacts on both physical and mental health (Taylor *et al.*, 2021). Operation definition of cigarette smoking is the single biggest contributor to death and morbidity worldwide. First, smoking may lead to increased anxiety; second, anxiety may increase smoking rates; or third, smoking and anxiety rates may both be influenced by shared vulnerability factors. The purpose of this study was to determine the relationship between anxiety levels and cigarette smoking among nurses (Hartono *et al.*, 2021).

METHODOLOGY

A descriptive correlation design study was utilized to explore the correlation between cigarette smoking and anxiety levels among nurses. The study was conducted among nurses working in Baquba Teaching Hospital, Diyala Governorate, from September 10th, 2023 to January 28th, 2024. All hospital staff nurses who were on duty at the time of data collection made up the study population. Participation in the study was voluntary, and only nurses who agreed to take part were included. On the other hand, the exclusion criteria consisted of staff nurses who refused to participate in the study and nurses who did not smoke during the data collection phase.

A nonprobability purposive sampling method was adopted to select a sample of 200 nurses from divergent units and departments in Diyala Governorate hospitals. The sample size was determined by a single population proportion formula, taking into consideration the following hypotheses: total population (nurses) = 412, 95% confidence, 5% error 5/100 = 0.05; if N = 412, n = sample size E = margin of error n = N / [1 + (N) (E) 2] n = 412/ [1+200 (0.05)2], n = 412/ [1+412 (0.0025)], n = 412/ [1 +0.3325], n = 412/ 1.3325 n = 200. The Raosoft program was used with a specific confidence interval of 5% and a confidence level of 95% to determine the sample size (Majeed *et al.*, 2023). Data were gathered using a self-administered questionnaire from January 1, 2024 to January 28, 2024. The study instruments incorporated two parts. Ten questions concerning the demographic traits of nurses were produced by the researchers for the first section of the nurse information tool. The second part is the Taylor Manifest Anxiety Scale, prepared by Taylor (1953). The scale was modified by the researcher, who inserted the required items, changed the scale from its original English version to Arabic, and then translated it back into English. In conclusion, this study endeavour employed the confirmed tools. The TMAS was manipulated to gauge the participants' level of anxiety. Each item on the level of apparent anxiety was arranged according to the following scale: Yes (2), No (1). The cut-off point is calculated according to the following: 1 + 2 = 3 ÷ 21.5. In order to determine the cutoff threshold for the anxiety levels in the sample, the following anxiety levels were considered: 1-1.33 = mild, 1.34-1.66 = moderate, and 1.67-2 = severe (Mohammed *et al.*, 2020). It was emphasized to the participating nurses that their involvement in the study was completely voluntary, and they provided written informed consent. They were also assured that their responses would be treated with confidentiality. Descriptive and inferential statistical procedures were performed. Descriptive analysis involved presenting the data using frequency, percentage, mean, and standard deviation. To assess the relationship between anxiety levels and certain demographic characteristics, the chi-square test was utilized. To find out the correlation between anxiety levels and smoking cigarettes with Spearman correlation tests. Statistical significance was considered when the p-value was less than 0.05. All data analysis was executed using SPSS Statistics (version 26).

Ethical Consideration

This research received ethical permission from the Clinical Research Ethics Committee, College of Nursing, University of Baghdad, Iraq with reference no. 2101 on 22nd November, 2023.

RESULTS

Table 1: Distribution and Comparison of the Samples Based on Demographic Characteristics of the Study Participants

Demographic Variables	Study Participants (N=200)		
	Groups	Frequency	Percentage
Age	20-29 years	139	69.5
	30-39 years	46	23.0
	40-49 years	10	5.0
	50 years & above	5	2.5
	Total	200	100.0
	M.S±SD = 28.97±6.695		
Gender	Male	190	95.0
	Female	10	5.0
	Total	200	100.0
Marital status	Single	101	50.5
	Married	99	49.5
	Total	200	100.0
Educational level	Nursing school	15	7.5
	Diploma	114	57.0
	College	69	34.5
	Postgraduate	2	1.0
Monthly income	300.000-600.0000 Iraqi Dinar	92	46.0
	600.1000-900.000 Iraqi Dinar	77	38.5
	900.1000and above	31	15.5
	Total	200	100.0
Residence	Urban	163	81.5
	Rural	37	18.5
	Total	200	100.0
Experience years in nursing	Less than one year	23	11.5
	1-4 years	86	43.0
	5-9 years	55	27.5
	10 years & above	36	18.0
	Total	200	100.0
Smoking cigarette	No smoking	69	34.5
	Smoking	131	65.5
	Total	200	100.0
Number of smoking	No smoking	69	34.5
	20 cigarettes	70	35.0
	20-39 cigarettes	54	27.0
	40 cigarettes & above	7	3.5
	Total	200	100.0
E-cigarette	No smoking of E-cigarettes	32	16.0
	Smoking E-cigarette	168	84.0
	Total	200	100.0

		F	%
Number of E-cigarettes	No smoking	32	16.0
	1-2 per day	33	16.5
	3 & above per day	135	67.5
	Total	200	100.0
Hookah	No hookah smoking	79	39.5
	Hookah smoking	121	60.5
	Total	200	100.0
Amount of hookah smoking	No hookah	79	39.5
	1-2 per day	85	42.5
	3 and & above per day	36	18.0
	Total	200	100.0
Number of smoking years	1-5 years	134	67.0
	6-10 years	52	26.0

F= frequency; %= percentage.

Table 1 presents the findings of the study, covering the characteristics of smoking nurses. The average age of smoking nurses was 28.97 ± 6.695 years, with the highest percentage (95%) falling within the age group of 20–29 years. Among the study sample, a majority of nurses who smoke were male (95%), and a small portion were female (5%). In terms of marital status, 49.5% of smoking nurses were married, while 50.5% were single. Additionally, a significant proportion of smoking nurses held diplomas (57%).

Regarding residency, the majority of smoking nurses resided in urban areas (81.5%). In terms of monthly income, 46% of smoking nurses reported receiving an insufficient income, while 43% had high experience levels, ranging from 1 to 4 years working in the hospital. Regarding the type of smoking, 65.5% of smoking nurses preferred cigarettes, with approximately 35% of them smoking around 20 cigarettes per day. Furthermore, 84% of smoking nurses reported using electronic cigarettes, with 67.5% of them smoking three times or more daily. Additionally, 60.5% of smoking nurses stated smoking hookah, with 42.5% of them smoking 1-2 times per day. Considering the duration of smoking, the highest percentage (67%) of smoking nurses mentioned smoking for 1–5 years.

Table 2: Descriptive Analysis of The Level of Anxiety Among Nurse Smokers

Anxiety Items	Yes		No		M.S	SD	Ass
	F	%	F	%			
1. My sleep is disturbed and intermittent	103	51.5	97	48.5	1.52	0.501	MO
2. There were times when I could not sleep because of anxiety	119	59.5	81	40.5	1.60	0.492	H
3. I think I am more nervous than most people	98	49.0	102	51.0	1.49	0.501	MO
4. I have disturbing dreams or nightmares sometimes every night	75	37.5	125	62.5	1.38	0.485	MO
5. I experience gastrointestinal distress	83	41.5	117	58.5	1.41	0.494	MO
6. I notice that my hands shake when I try to do something	73	36.5	127	63.5	1.37	0.483	MO
7. I suffer from bouts of diarrhea	35	17.5	165	82.5	1.18	0.381	M
8. Work and money matters make me anxious	136	68.0	64	32.0	1.68	0.468	H
9. I get bouts of nausea	73	36.5	127	63.5	1.37	0.483	MO
10. I am afraid that my face will turn red in embarrassment when faced with situations	82	41.0	118	59.0	1.41	0.493	MO
11. I feel hungry almost all the time	96	48.0	104	52.0	1.48	0.501	MO
12. I get tired quickly	115	57.5	85	42.5	1.58	0.496	MO
13. Waiting makes me nervous	155	77.5	45	22.5	1.78	0.419	H
14. I feel so excited that I cannot sleep	67	33.5	133	66.5	1.34	0.473	MO
15. I experience unstable intervals that make it difficult for me to be seated for extended periods	111	55.5	89	44.5	1.56	0.498	MO
16. I feel worried about something or someone	136	68.0	64	32.0	1.68	0.468	H
17. I am afraid to face crises and adversity	94	47.0	106	53.0	1.47	0.500	MO

18. I would like to be as happy as others seem	135	67.5	65	32.5	1.67	0.470	H
19. I can't help but worry about something	131	65.5	69	34.5	1.65	0.477	MO
20. I definitely feel like I am useless	35	17.5	165	82.5	1.18	0.381	M
21. Sometimes I feel like I am not feeling well	122	61.0	78	39.0	1.61	0.489	MO
22. I sweat easily even on cold days	61	30.5	139	69.5	1.31	0.462	M
23. Life is difficult for me most of the time	102	51.0	98	49.0	1.51	0.501	MO
24. I noticed that my heart was beating hard, and I was feeling distressed	86	43.0	114	57.0	1.43	0.496	MO
25. It is hard for me to cry easily	131	65.5	69	34.5	1.66	0.477	MO
26. I was afraid of things or people that I knew could not harm me	89	44.5	111	55.5	1.45	0.498	MO
27. I tend to be affected by events	137	68.5	63	31.5	1.69	0.466	H
28. I get headaches frequently	96	48.0	104	52.0	1.48	0.501	MO
29. I worry about worthless things	106	53.0	94	47.0	1.53	0.500	MO
30. I find it difficult to concentrate	91	45.5	109	54.5	1.45	0.499	MO
31. I think I am never good at my job	32	16.0	168	84.0	1.16	0.368	M
32. I am a very nervous person	72	36.0	128	64.0	1.36	0.481	MO
33. The sweat pouring off of me is so confusing that it really irritates me	34	17.0	166	83.0	1.17	0.377	M
34. My face turns red when I talk to others	52	26.0	148	74.0	1.26	0.440	M
35. I am more sensitive than most people	89	44.5	111	55.5	1.44	0.498	MO
36. At times I thought that my problems were getting bigger and worse till I was unable to deal with them	102	51.0	98	49.0	1.51	0.501	MO
37. I get very nervous while doing something	66	33.0	134	67.0	1.33	0.471	M
38. My hands and feet are usually cold	66	33.0	134	67.0	1.33	0.471	M
39. I dream of things I'd rather keep to myself	133	66.5	67	33.5	1.67	0.473	H
40. Occasionally, I experience constipation	95	47.5	105	52.5	1.48	0.501	MO
Total mean of score	3714	46.4	4286	53.6	1.46	0.47	MO

*F=frequency; %= percentage; *M.S. = mean of score; SD=standard deviation; *Ass. =level of assessment; 1-1.33- =mild (M); 1.34-1.66= moderate (MO); 1.67-2= high (H).*

Based on the average score of the subject, Table 2 illustrates the level of anxiety among smoking nurses working in the hospital. These results indicated that nurses had a moderate anxiety level based on the total mean score M(SD)= 1.46(0.47).

Table 3: Correlation between Cigarette Smoking and Anxiety Level

Variables	Spearman correlation	*P*-value	Sig.
Smoking cigarette	0.870**	0.000	HS
Number of smoking cigarettes	0.768**	0.000	HS
Smoking E-cigarette	0.371**	0.003	S
Number of E-cigarette	0.768**	0.000	HS
Hookah	0.358**	0.000	HS
Amount of hookah smoking	0.229**	0.002	HS
Number of smoking years	0.296**	0.000	HS

*** Correlation is significant at the 0.01 level*

The analysis displayed a significant correlation with a *p*-value of 0.01 ($p > 0.05$). The correlation coefficient (r) pinpointed a positive and strong correlation between all variables linked to cigarette smoking and anxiety levels. Specifically, the number of cigarettes smoked ($r = 0.831$**), smoking E-cigarettes ($r = 0.539$*), number of E-cigarettes smoked ($r = 0.876$**), hookah smoking ($r = 0.371$**), number of hookah smoking sessions ($r = 0.229$**), and years of smoking ($r = 0.636$**) all exhibited robust positive correlations with anxiety levels.

Table 4: Association Between Sociodemographic Characteristics and Level of Anxiety

Sociodemographic Variables	Anxiety Level		
	Chi-Square	*P*-Value	Sig.*
Age groups	0.916	0.000	H.S
Gender	0.416	0.233	N.S
Marital status	0.407	0.312	N.S
Educational level	0.586	0.580	N.S
Years of experience in nursing	0.473	0.043	HS
Smoking cigarettes	0.382	0.554	N.S

Sig. = significance level ≤ 0.05= significant

Table 4 demonstrates that the association between sociodemographic factors and anxiety levels was highly statistically significant for variables such as age groups and years of nursing experience. However, no statistically significant relationship was discovered for variables such as gender, marital status, educational level, monthly income, place of residence, and smoking status among nurses who were smokers at Baquba Teaching Hospital (p-value < 0.05).

Descriptive Analysis of Overall Anxiety Level among Smoker Nurses

17%

35.5%

47.5%

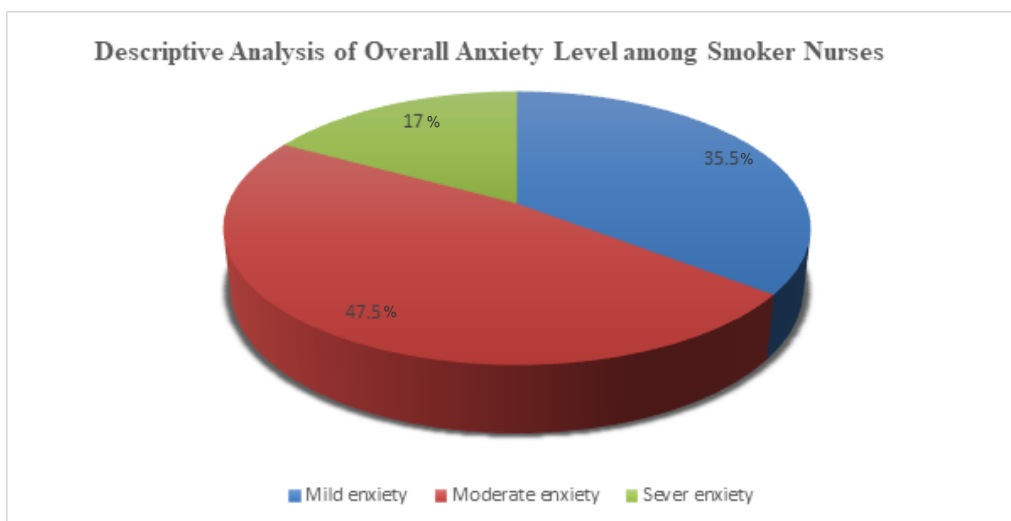■ Mild enxiety   ■ Moderate enxiety   ■ Sever enxiety

Figure 1: Descriptive Analysis of Overall Anxiety Level among Smoker Nurses

Figure 1 illustrates that 47.5% of nurses had a moderate level of anxiety, while 35.5% experienced a mild level of anxiety, and 17.0% suffered from a severe level of anxiety regarding smoking cigarettes.

DISCUSSION

There were 200 participants in all, with the majority being male (95%) and females accounting for only 5% of the total participants. These findings were in line with several other studies that also documented a higher proportion of male participants (63%) compared to female participants (37%; Majeed *et al*., 2023; Al-Reda *et al*., 2023). Among the study participants, a majority (69.5%) fell within the age range of 20 to 29 years. The mean age was 28.97 ± 6.695 years. 57.5% of the respondents held a diploma in educational level. Additionally, 50.5% of the nurses were single. In terms of work experience, 43.5% of the nurses had been employed in the nursing field for 1- 4 years. These were consistent with the findings of Majeed and Atiyah (2021) and Abid *et al*. (2018). Regarding residence, the study reported that 81.5% of the study sample lived in urban areas, which was consistent with another study finding that 61.7% of the sample resided in urban areas (Majeed & Atiyah, 2021; Majeed, Hassan & Abid, 2020). In relation to smoking habits, a high percentage of smokers (67%) had been smoking for 1–5 years. Furthermore, 65% of smokers reported smoking 1-3 times during their work in the hospital. These results agreed with a previous study (Salman & Bakey, 2021). Comparing levels of anxiety and sleep quality between smokers and nonsmokers, it was found that the smokers' group had higher levels of anxiety and lower sleep quality values compared to the control group ($p<0.001$).

There were also relationships observed between the duration of smoking, quantity of cigarette consumption, anxiety, and sleep quality. The study concluded that smoking led to increased anxiety levels and decreased sleep quality. Additionally, the longer the duration of smoking, the higher the degree of anxiety, and the higher the level of anxiety, the lower the quality of sleep (Yasir & Hassan, 2021). The outcomes of this study emphasize a significant association between cigarette smoking among nurses and anxiety levels. Psychological factors are closely linked to nurses with anxiety disorders, who may turn to cigarettes as a means of alleviating their anxiety. Environmental factors, such as family environment, smoking parents, peers, societal influence, and cigarette advertisements, also contribute to smoking behavior among nurses (Çökmen, Yilmaz, & Sert, 2023). Out of the 200 participants in this study, 95 (47.5%) were identified as having moderate anxiety levels, while most nurses, 71 (35.5%), experienced mild anxiety. Additionally, 34 participants (17%) exhibited severe anxiety levels. Statistical tests yielded a p-value of 0.05, supporting the findings.

These results (Ratnasari, Kulsum, & Hastuti, 2021) align with previous studies that have established an interrelation between anxiety levels and cigarette smoking among nurses. The prevalence and intensity of smoking behavior among nurses can be attributed to the desire for comfort and relaxation when faced with numerous tasks, thereby diminishing stress and anxiety. Mild anxiety among nurses raises their alertness, but moderate anxiety leads to increased selectiveness while still being open to guidance. Severe anxiety, on the other hand, prompts nurses to engage in behaviors aimed at decreasing stress. Smoking serves as an escape mechanism for young individuals facing anxiety-inducing problems. The mounting workload and thoughts contribute to nurses' anxiety as they struggle to cope with increased duties and responsibilities. This drives nurses to seek alternative sources of pleasure to find comfort and relaxation and momentarily forget their pending tasks. In light of these observations, it becomes crucial for nurses to acquire strategies for managing anxiety that do not involve smoking or other negative behaviors. Hayat's study highlights one such strategy, known as relaxing breathing or respiratory relaxation. This technique is particularly useful in situations where complex relaxation may not be feasible, such as when nurses are under pressure to complete multiple tasks. Respiratory relaxation is considered an accessible and cost-effective approach to transform anxiety into a zest for life, regulate emotions, and delay feelings of anger (Hayat, 2017). Another study conducted by Setiaden found a significant positive relationship between anxiety and smoking behavior (Setyadin & Uyun, 2020).

Rodgers *et al.* (2022) claimed that current smokers had higher anxiety scores compared to never-smokers at baseline, and these scores remained stable over 4 years. Similarly, their study revealed that anxiety prevalence was higher in current smokers compared to never-smokers at baseline, and this prevalence remained consistent over 2 years. Based on the research answers provided by the participants, it could be observed that they tended to experience fluctuating feelings associated with anxiety. For example, they easily felt anxious in certain situations, found relief once the situation had passed, and experienced unexplained fear, fatigue, and a tendency to panic. Participants often turned to cigarettes to boost their enthusiasm, induce relaxation, and alleviate stress. It was important to acknowledge that anxiety is a natural part of daily life, arising from personal growth, changes, new experiences, and the search for identity and meaning. Therefore, it was unlikely for anxiety to completely disappear from individuals' lives.

Nurses consistently face anxiety related to smoking, like difficulties concentrating and feeling burdened by work tasks. The correlation analysis using Spearman's rho highlighted a significant value of 0.01 ($p > 0.05$), marking a strong correlation. The correlation coefficients (r) showed positive and significant associations between smoking variables and anxiety levels. These findings support prior studies that have reported similar significant associations between smoking variables and anxiety levels (Fahrizal & Risdiana, 2021). Understanding these correlations is crucial in discussing the specific challenges faced by nurses in managing their anxiety linked to smoking. Our findings align with and build upon previous prospective analyses, which have demonstrated that individuals who smoke are at a higher risk of developing mental health conditions such as depression, anxiety, and sleep disturbances (Hahad *et al.*, 2021; Mo *et al.*, 2020). In Table 4, a statistically significant association (p-value < 0.05) between sociodemographic characteristics and anxiety levels was described. Specifically, age and years of experience in nursing were identified as significant factors. The study uncovered that having experience in nursing cut down the prevalence of anxiety by 0.97 times. These results are consistent with previous studies that reported similar associations between age, years of experience, and

anxiety levels (Fahrizal & Risdiana, 2021; Hahad *et al*., 2021; Mo *et al*., 2020).

Limitations

This study's strength is the use of standard instruments, which improves the validity of the findings and interpretation. The high sample size and range of healthcare sectors can offset the limitations of using a self-reported questionnaire, which restricts the in-depth comprehension of the study variables.

CONCLUSION

Based on extensive research, comprehensive data analysis, and in-depth discussions conducted on the relationship between anxiety levels and cigarette smoking among nurses, the following conclusions can be drawn: It is known that the level of anxiety among nurses is mostly moderate (47.5%). There is a relationship between the level of anxiety and cigarette smoking among nurses as a function of age groups and years of experience in the hospital, with a value of $p < 0.05$. Based on the respondents' answers to the results of the questionnaire statement, almost all respondents answered that they feel somewhat worried. Respondents feel that they cannot cope with living without smoking. They smoke sometimes when they are relaxed, and some people stop smoking if others are bothered by cigarette smoke. This becomes a reason for nurses to resort to cigarettes to increase enthusiasm and to obtain a feeling of comfort and relaxation when they have many tasks to do to reduce the stress and anxiety that nurses suffer from. Nurse smokers must be equipped with knowledge on how to deal with anxiety as well as smoking or other negative behaviors.

Conflict of Interest

The authors declare that they have no competing interests.

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