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Comparison of quality of working life of anesthesia assistants of COVID-19 and Non-COVID-19 intensive care units: A comparative study

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Abstract---Background: The Coronavirus Disease 2019 (COVID-19) pandemic has exposed Anesthesia Assistants, "an essential and active group involved in the treatment and care of these patients, to a lot of stress that may affect their quality of working life. The aim of this study is to determine and understand the quality of life among anaesthesia assistants, who are coping with COVID-19 and non-COVID-19 intensive care units".Method: This cross-sectional study enrolled 1,100 Anesthesia Assistants of COVID-19 and non-COVID-19 intensive care working at the time of the COVID-19 outbreak in treatment centers in different regions of Iraq. "This study used the convenience sampling strategy. Data were collected using an interview questionnaire from anaesthesia assistants. The stepwise multiple linear regression models were used to examine the relationships among self-reported worrying regarding COVID-19 and SF-36 quality

of life, its components, and subscales. Partial R was used as an estimate of effect size".Result: The mean SF-36 score was 65.2 (SD=17.6). "The mean score of the mental component summary (MCS) (M=56.8, SD=22.3) was lower than the mean score of the physical component summary (PCS) (M=69.5, SD=16.5)". The mean score of COVID-19 anxiety was 17.8 (SD=10.5). Of the participants, 138 (34.3%; 95% CI [29.6%, 35.8%]), and 51(12.5%,96% CI [12.4%, 17.4%]) showed moderate and high-level anxiety, respectively. Regarding the results of the stepwise multiple linear regression model, after adjusting for possible confounding variables, the SF-36 quality of life was still risked negatively associated with COVID-19 anxiety, with a big effect size (The partial r = -0.516p < 0.001). "The relationship between the SF-36 components and COVID-19 anxiety were also significant, and moderate to large effect sizes were observed (The partial r for (PCS; COVID-19 anxiety) = -0.403; p < 0.001, and for MCS; COVID-19 anxiety) = -0.522; p < 0.001)". to sum up, "significant correlation coefficients for every subscale of the SF-36 were found for COVID- 19 anxiety and its two components, with small to large effect sizes" (The partial correlations= -0.211 to -0.524, all PS< 0.001). Conclusions: The results showed that higher COVID-19 anxiety level Infection in "Anesthesia Assistant with COVID-19 lead to lower quality of working life. In order to increase the quality of life of the anaesthesia assistant working in Covid-19 during the Covid-19 epidemic, it is recommended to design and implement programs to reduce their anxiety".

Keywords---COVID-19, quality of life, pandemic, anesthesiology, critical care.

Introduction

Pneumonia caused by the new Coronavirus, which was discovered in December 2019 in the Chinese city of Wuhan, led to the spread of the global Corona pandemic. In February 2020, the World Health Organization(WHO) called this disease the coronavirus disease 2019 (COVID-19). A person with laboratory confirmation of the virus causing COVID-19 infection irrespective of clinical signs and symptoms is considered aconfirmed case [1]. "Globally more than 3,750,000 confirmed individuals and over 250,000 deaths, across more than 200 countries, territories or areas have been reported"[2]. However, about 14% of confirmed cases doubled into a very severe disease [3], But it recorded 4.2% as a major death rate [2Because the rate of increase in dangerous cases and at the same time the continued spread of the virus, health care workers have to carry out effective management and complete protection for patients infected with COVID-19. Whereas, anesthesiologists anaesthesia technicians and critical care workers are considered among the most specialized specialties that worked to confront COVID-19 during the epidemic period, as well as benefited Some of the services of resident anaesthetists who have high capabilities in making the right decisions.

The stress related to COVID-19 has led to an increase in the level of stress, depression and anxiety among citizens including nurses. [4]. Regarding the practices and behaviours of the anaesthesia assistant in hospitals, this led to a significant change in most of the behaviours of the anaesthesia assistant during the outbreak of the Corona epidemic, such as the use of gloves, washing hands, using the mask and cleaning the surface increased frequently. In addition to the use of special masks in markets, parks and places in other public in order to limit the spread of the virus. They asked other Anesthesia assistants, nurses, medical staff and visitors to use a mask at the hospitals. Anesthesia assistants used masks and gloves in hospitals. As for food, they had a hospital eating schedule where they never eat food at the same time and were in contact with other nurses during breaks from hard work. According to an online survey, adults were more stressed by Depression than children during the COVID-19 pandemic [5].

In order to combat infectious viral diseases, health workers need good mental health [6]. Because stress at work reduces immunity, this is evidence that medical staff of anaesthesia assistants and nurses are more susceptible to infection with the Coronavirus. Many studies related to the Corona virus are linked to epidemiological factors, but unfortunately few papers have focused on stress in nurses. [7–13]. The most tiring and exhausting occupation in the world is nursing because it leads to negative effects and health effects, both physical and spiritual, and there are many negative consequences in the medical system, including patients [14]. "Positive beliefs of individuals related to the future evolution of the pandemic are associated with post-traumatic growth, while negative beliefs are connected to post-traumatic symptoms "[15]. The Institute of Occupational Health and Safety held in the United States ranked 130 occupations that can lead to many mental health problems and nursing was ranked 27 with a high level of stress among many categories of medical workers [16]. "past studies confirmed an average or increased level of stress for nurses in India (87.4% of individuals in a sample), Iran (57.4%) and Saudi Arabia (45.5%) "[17].

Quality of work life is one of the variables that has recently been considered by many code managers in terms of importance in order to improve the quality of their human resources [18][19]. This was evaluated by the residents' Such attention reflects the importance that everyone has for the quality of life. Studies also show that the quality of work life of people is not only related to their working conditions and job satisfaction, "but also affects their personal lives the medical education process, as constructive, both concerning their training and provision of clinical services". The aim of this study was to evaluate the quality of life of anaesthesia assistants in the COVID-19 ward compared to the non- COVID-19 ward in Iraq.

Material and Method

In this cross-sectional study, will be collecting samples in Iraq, Thi Qar Government, at Imam Hussein Teaching Hospital a sample of 1,100 Anesthesia Assistants in care units for patients with COVID-19 (group 1) and Anesthesia Assistants in non-COVID-19 patient care units (group 2—in hospitals were obtained. We have chosen a random sample of employees working in the intensive care unit. They were interviewed and they filled out the questionnaire. Including

Richard Walton for Quality of life Through the SPSS program, the data was analyzed as well as the statistical and descriptive methods. The distributions of study participant baseline characteristics will be presented as frequencies with proportions, means, medians and inter-quartile ranges allof this analysis will be calculated with a 95% of confidence interval (CI). For the Anesthesia Assistants employed and non-employed with COVID-19 as a dichotomous variable, the association of work of life quality and categorical variables like type of control etc. the chi square and to compare mean dependent variables such as age in these two groups, the t-student test will be used. Uni-variable regression logistic analysis will be used to determine a 95% confidence interval and the odds ratio of the assistant anaesthesia employed for each independent variable as a measure of association. Also, stepwise logistic regression will be used to determine a 95% confidence interval and the odds ratio of the assistant anaesthesia s non-employed for each independent variable adjusted with potential confounders. All analyses will be conducted as 2 tailed and a p-value less than 0.05 is considered significant. The analysis will be conducted by SPSS.

Result

After completing the questionnaire by the anaesthesia assistants, data analysis was conducted from 1100 participants, where the average age of the participants was (SD =7.0)31.3 as their ages ranged from (20-50) years. As for their scientific experience, the average was (6.4) 7.7 years. In this table, we will note the other characteristics of the participants.

Table 1
Characteristics of the participants

Variable	
Gender, n (%)	
Female	870 (79.1)
Male	230 (20.9)
Educational level, n (%)	
Associate's degree/ Bachelor's degree	950(86.3)
Master's degree/ PhD	150 (13.6)
Marital status, n (%)	
Married	730 (66.3)
Single/ divorced/ widowed	370 (33.6)
Income, n (%)	
Low	420 (38.1)
Moderate and higher	680 (61.8)
Field of study, n (%)	
Anesthesia Assistants	810(73.6)
Anaesthesia technician	290 (26.3)
Exposure to COVID-19 patients, n (%)	
Yes	970 (88.1)
No	130 (11.8)
History of mental illness, n (%)	

Yes	65 (5.9)
No	1,035 (94.1)
Underlying medical condition, n (%)	
Yes	120 (10.9)
No	980 (89.1)
Physical exercise, n (%)	
Yes	350(31.8)
No	750 (68.1)

As is noted in this Table 2, the mean scores of COVID-19 anxiety (CDAS total score) was 17.8(SD=10.5)."Of the participants, 200 (53.2%; 95% confidence interval (CI) [50.2%, 56.1%]) of the participants had mild anxiety", 78 (33.4%,95% CI [30.7%, 36.3%]) had moderate anxiety and 52 (13.4%; 95% CI: [11.5%, 15.6%]) had severe anxiety. "Psychological symptoms related to COVID-19 had a mean score of 12.8 (SD=5.7), with 97 (35.1%; 95% CI [32.3%, 37.9%]), 153 (47.1%; 95% CI [44.2%, 50.1%]), and 20 (17.8%; 95% CI [15.6%, 20.1%]) of individuals having mild, moderate, and severe psychological symptoms, respectively". "The mean physical symptoms score regarding COVID-19 was 4.9 (SD=5.5), with 102 (9.0%; 95% CI [7.4%,10.8%]), 88 (77.8%; 95% CI [75.3%, 80.2%]), and 49 (13.2%; 95% CI [11.3%,%]), of individuals having mild, moderate, and severe physical symptoms, respectively".

Table 2
SF-36 quality of life, and COVID-19 anxiety scores among Anesthesia assistants (n=1,100)

Variable	Mean *(SD)*
SF-36 quality of life	
SF-36 total score	63.1 (16.5)
SF-36 components	
PCS	70.5(18.1)
MCS	54.7 (21.5)
SF-36 subscales	
Physical functioning	80.6(20.6)
Role-physical	58.6(40.1)
Bodily pain	67.7(30.1)
General health perceptions	59.6 (20.1)
Vitality	60.3(20.9)
Social functioning	60.1(24.7)
Role-emotional	60.4(39.8)
Mental health	60.2(20.9)
COVID-19 anxiety	
CDAS total score	18.5(11.3)
CDAS components	
Physical symptoms	5(5.1)
Psychological symptoms	13.7(6.6)

Through the questionnaire, it was found that "the mean SF-36 score was 65.2 (*SD*=17.6). The mean score of MCS (*M*=56.8, *SD*=22.3) was lower than the

mean score of the PCS (*M*=71.6, *SD*=17.5)". Among the MCS subscales, the lowest mean score was related to vitality (*M*=54.4, *SD*=22.0) followed by social functioning (M=57.1, SD=26.7), role-emotional (*M*=57.5, *SD*=41.7), and "mental health (*M*=58.1, *SD*=21.1). Among the PCS subscales, most scores were related to physical functioning (*M*=81.0, *SD*=19.3), bodily pain (*M*=70.6, *SD*=24.6), and general health (*M*=61.9, *SD*=19.1), and role-physical (*M*=60.9, *SD*=35.9)", respectively (Table 2).

According to the results of the final univariate analysis, it was noted that the quality of life SF-36 is statistically lower, as well as the scores of its two components are lower for the anaesthesia assistants the female gender, lower income, exposure to COVID-19 patients, history of mental illness, and underlying medical conditions (All ps < 0.001). "Higher scores of SF-36 quality of life and its two components were observed among Anesthesia Assistants who had physical exercise (ps < 0.001). Married Anesthesia Assistants reported higher scores on the MCS component (p=0.008). Lower scores were observed among smoker Anesthesia Assistants than non-smokers (p = 0.011)". overall,"There were no significant differences among Anesthesia Assistants with different educational levels in SF-36 quality of life or its components (ps > 0.05)" (Table 3).

Table 3
SF-36 and its two components' scores by characteristics of the participants (1,100) Anesthesia Assistants

Variable	PCS		MCS		SF-36	
	Mean (SD)	P-value†	Mean (SD)	P-value†	Mean (SD)	P-value†
Gender		<0.001		<0.001		<0.001
Female	70.4 (18.3)		54.4 (24.1)		65.2 (18.1)	
Male	80.1 (15.1)		62.3 (21.4)		72.1 (16.1)	
level of Educational		0.150		0.250		0.160
Bachelor's Degree	71.4(17.4)		56.5 (22.3)		67.3.0 (18.3)	
Master's, PhD degree	73.5(17.3)		60.1		68.4	
			(22.4)		(18.4)	
Marital status		0.085		0.008		0.710
Married	70.5 (19.1)		60.1 (23.4)		66.1 (17.7)	
Single,widowed and divorced	73.5 (17.1)		55.1 (23.4)		66.2 (17.4)	
Income		<0.001		<0.001		<0.001

Mild	69.2 (19.3)		52.4 (23.1)		61.3 (17.9)	
Higher and Moderate	74.3 (17.4)		60.1 (22.4)		68.3 (17.1)	
Patients' Exposure to COVID-19		0.001		0.001		<0.001
Yes	71.2 (18.2)		56.3 (21.1)		65.3 (18.2)	
No	75.2 (17.2)		63.1 (21.9)		69.5 (18.4)	
Medical history of mental illness		<0.001		<0.001		<0.001
Yes	60.5(18.1)		42.1 (16.6)		50.1 (16.2)	
No	73.2 (16.9)		57.6 (21.8)		65.7 (16.8)	
Basic medicalconditions		<0.001		<0.001		<0.001
Yes	64.6 (17.9)		50.6 (21.7)		67.5 (17.1)	
No	75.1 (17.1)		60.1 (22.2)		60.1 (18.2)	
Smoker participant		0.910		0.011		0.154
Yes	72.3 (17.1)		54.3 (21,5)		64.2 (16.6)	
No	72.4 (18.2)		58.1 (20.7)		66.2 (18.4)	
Physical exercise		<0.001		<0.001		<0.001
Yes	73.5 (17.1)		61.3 (22.3)		69.3 (17.3)	
No	66.8 (19.2)		49.5 (23.4)		61.5 (17.8)	

According to "the results of bivariate, unadjusted Pearson correlation coefficients the SF-36 quality of life, its two components, and all SF-36 subscales were negatively correlated with COVID-9 anxiety (CDAS total score) and its two components" (Table 4).

Table 4
Correlation coefficients between SF-36 quality of life, its components, and subscales with COVID-19 anxiety (CDAS score and its components) among Anesthesia Assistants (n=1,100)

Variables	CDAS Total score	CDAS component A: Physical symptoms	CDAS component B: Psychological symptoms

	Correlation coefficient*		Correlation coefficient*		Correlation coefficient*	
	Raw†	Adjusted‡	Raw†	Adjusted‡	Raw†	Adjusted‡
SF-36 overall						
SF-36 total score	-0.559	-0.520	-0.560	-0.512	-0.509	-0.407
SF-36 components						
PCS	-0.501	-0.415	-0.461	-0.416	-0.404	-0.343
MCS	-0.570	-0.530	-0.533	-0.500	-0.527	-0.478
SF-36 subscales						
Physical functioning	-0.340	-0.290	-0.340	-0.320	-0.281	-0.234
Role-physical	-0.320	-0.270	-0.340	-0.280	-0.266	-0.211
Pain score	-0.377	-0.351	-0.414	-0.360	-0.325	-0.274
General Perceptions health	-0.415	-0.360	-0.354	-0.370	-0.420	-0.369
Vitality	-0.500	-0.460	-0.445	-0.420	-0.474	-0.423
Social functioning	-0.530	-0.510	-0.511	-0.490	-0.474	-0.452
Emotional Role	-0.420	-0.400	-0.412	-0.354	-0.380	-0.350
Mental health	-0.490	-0.501	-0.430	-0.500	-0.501	-0.430

Regarding the results of the stepwise multiple linear regression model after observing the last adjustment by sex, age, educational level, basic medical conditions, income, marital status, mental history, smoking, exposure to coronavirus and physical exercise. It was noted that SF-36 working quality of life is negatively related to anxiety. Coronavirus (Table 5), with a high effect size (The adjusted partial r: -0.515, $p < 0.001$) (Table 4). Regarding standardized regression coefficients, the most important factor in the identification of the quality of life score was COVID-19 anxiety (β=-0.47). For each unit of high mean anxiety score, there are reduced by 0.79 units ($p < 0.001$)the quality of life score. Also, "results showed that the mean quality of life score in males was 6.52 units higher compared to females; people with underlying diseases and a history of mental illness had 5.32 and 8.09 units lower quality of life, respectively; and people with lower income had 4.31 units lower quality of life (ps < 0.001)". Smoking, Physical Activity, and exposure to COVID-19 patients had a statistically significant relationship with quality of life, such that (β=-0.07, p=0.002) or smoking Anesthesia Assistants

(β=-0.08, p=0.001) had a decreased quality of life. "In contrast, people with higher physical activity had a higher quality of life score (β=0.13, $p < 0.001$) (Table

5). The total variance of anxiety explained by the independent variables in the model was 41.4% ((8, 1122) =100.719, p < 0.001, Adjusted R2= 0.414). The results of stepwise multiple linear regression models, for the relationship between the SF-36 components and COVID-19 anxiety, were similar (SF-36; COVID-19 anxiety) (Table 5), and moderate to large effect sizes were observed (The partial r for (PCS; COVID-19 anxiety): -0.404 and for (MCS; COVID-19 anxiety): -0.521, ps < 0.001)" (Table 4).

Discussion

The aim of this cross-sectional study is to know and determine the effect of anxiety and stress from COVID-19 on the quality of working life for anesthesia assistants working in the intensive care unit as well as non-working in the intensive care unit. After completing the results, it was found that after adjusting the effect of individual characteristics, there is no statistically significant relationship between the quality of life and COVID-19, but the resulting increase in the average degree of anxiety and the decrease caused by the degree of quality of life by (0.81) unit is considered a more important factor in determining the quality of working life. "As a delegation for each of them. Other results indicated that 13.4% of Anesthesia Assistants had severe COVID-19 anxiety. Hang et al. (2020) showed that COVID-19 anxiety level in Anesthesia Assistants is higher than in other occupational groups and they are more exposed to mental health issues" [20]. Nemati et al. (2020) said that "they assessed nurses' staff anxiety and stress level in the face of COVID-19 and found that the level of anxiety caused by COVID-19 was increasing" [21]**.**

In this study, which was conducted on anesthesia assistants, the results of psychological and physical stresses showed an average score of 12.8 (SD=5.7) and 4.9(SD=5.5), respectively as well as "A study by Judaki et al. (2019) on Anesthesia Assistants showed that psychological domain 51.77(SD=8.52) scored the highest while physical domain 34.14(SD=8.16) scored the lowest mean score of quality of working life" [22]. The common causes of musculoskeletal pain for anaesthesia assistants, and in turn leads to a deterioration in their quality of life. Work pressures, long and continuous working hours and discomfort, all are physical factors that cause stress in the working life of employees. [23].

As for patients suffering from respiratory problems, some studies confirmed that there is severe anxiety in their quality of life, and compared with other studies, where they confirmed that there is statistical significance between anxiety and quality of working life.[24]. The most important cause of concern for anaesthesia assistants is their work environment, and the damage caused to their working life is caused by anxiety, and unhealthy lifestyles pose a threat to their lives. Therefore, health professionals must consider the function of their work [25]."In the present study, conducted at the time of the COVID-19 outbreak in Iraq, information was collected using the capacity of social networks to observe the principles of health and social distancing, which is one of the strengths of the present study ,another strength of this study was sampling throughout all regions of Iraq". "The study present had some limitations. First, the sampling strategy was non-probability convenience sampling that could cause selection bias and limit generalizability. Second, this was a cross-sectional survey study and could

not prove the causality relationships. Third, self-reported questionnaires were used to collect data, in which, the mental states of Anesthesia Assistants could affect their answers". There are individual differences for the participants, which in turn affects their understanding of the quality of working life, so different methods of data collection should be used. Interviews and research may be in future studies. With regard to the results, we suggest that health sector officials develop appropriate capabilities to protect the anaesthesia assistants from the main causes of anxiety and stress associated with COVID-19, and this leads to improving their working life and obtaining high-quality care.

Conclusions

The final results of this study showed that there is a statistically significant relationship between anxiety and the working quality of life for anesthesia assistants, as the decrease in the quality of life among employees is the main reason for the increase in anxiety resulting from COVID-19. "Due to the inevitability of some factors that cause anxiety in Anesthesia Assistants and the need to prevent physical, psychological and behavioural effects of anxiety on Anesthesia Assistants, taking measures to improve working conditions and reduce Anesthesia Assistants' anxiety is necessary". In order to reduce the anxiety resulting from Covid-19, the managers of health institutions must improve management methods, create appropriate conditions to continue their professional activities, communicate well with them and provide them with the necessary support, improve the financial situation, reduce and manage working hours, and one of the most important aspects of health institution managers is that he must provide care health and take the necessary measures to reduce anxiety.

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Conflict of interes

The authors declare that they have no conflicts of interest

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