Evaluation Nurses' Knowledge and Attitudes about the Prevention of the Coronavirus Disease 2019 at Emergency Units in Government Hospitals in Baghdad city / Iraq

تقييم معارف ومواقف الممرضين حول الوقاية من مرض فيروس كورونا 2019 في وحدات الطوارئ في المستشفيات الحكومية في مدينة بغداد / العراق

Asaad Kamil Resham*
Dr. Wissam Jabbar Qassem**
Dr. Wasna Jumaa Mohammad***

الخلاصة:
خلفية البحث: إن المرض المعدي الناجم عن فيروس كورونا الجديد 2019 (19 Coved) الذي ظهر في ووهان الصين مرض شديد العدوى ويتسبب بوفاة ملايين الأشخاص حول العالم مما يضع جميع أنظمة الرعاية الصحية في تحدٍ معقد. لا تزال التدابير الوقائية المتعلقة بمرض كوفيد-19هي الأساس الراسخ في مكافحة العدوى. الممرضات في الخطوط الأمامية لأنظمة الرعاية الصحية هم أكثر عرضة لخطر التعرض للعدوى وبحاجة إلى استعداد عالي للنجاح في نضالهم ضد المرض.
الهدف: تهدف هذه الدراسة الحالية إلى تقييم مستوى معارف واتجاهات الممرضين حول الوقاية من العدوى والسيطرة عليها المتعلقة بمرض كوفيد-19 في وحدات الطوارئ في المستشفيات الحكومية في مدينة بغداد.
المنهجية: أجريت دراسة وصفية مقطعية تعتمد على التصميم المسحي. تم جمع بيانات الدراسة من خلال عينة هادفة (غير احتمالية) قوامها (817) ممرض بمختلف الاعمار خلال الفترة من 2 / تشرين الثاني / 2020 إلى 10 / آذار / 2021 وحدات الطوارئ للمستشفيات الحكومية في مدينة بغداد / العراق.
النتائج: أظهرت الدراسة وجود علاقة معنوية بين المستوى المعرفي و متغيرات الفئة العمرية، متغير الجنس، الخبرة في العمل ومواقع المستشفيات. كما أشارت النتائج الى عدم كفاية المعارف لدى المشاركين ومستوى إيجابي مرتفع من مواقفهم فيما يتعلق بالوقاية من كوفيد-19 في وحدات الطوارئ في مدينة بغداد، ومع ذلك كانت نتيجة التقييم العام للمعارف ومواقف الممرضين عالية المستوى عند حسابهما معاً.
الاستنتاج: ان الممرضين في وحدات الطوارئ (الخطوط الامامية) ليس لديهم معارف كافية حول مرض كوفيد-19 والوقاية منه مما يؤثر على استعداداتهم في مكافحة الوباء.
التوصيات: توصي الدراسة بضرورة تطوير معارف الممرضين وتحسين مواقفهم الإيجابية أتجاه الوقاية من عدوى كوفيد-19 ومكافحته الى أعلى مستوى.
الكلمات المفتاحية: تقييم، مرض كورونا فايروس (كوفيد-19)، الممرضين، المعارف و الاتجاهات، الوقاية والسيطرة على العدوى، وحدات الطوارئ.

ABSTRACT:
Background: The infectious disease caused by the novel coronavirus 2019 (COVID-19) is highly contagious and causes the death of millions of people globally. Preventive measures related to Covid-19 are the firm foundation in fighting the infection. Nurses in the frontline of healthcare systems are at the greatest risk of exposure to Covid-19 therefore, they need high preparedness for success in struggles against it.
Aims of the study: This study aims to evaluate the level of nurses' knowledge and attitudes about infection prevention and control concerning Covid-19 in emergency units of government hospitals in Baghdad city / Iraq.
Methodology: A cross-sectional descriptive study based on survey design is conducted through the period of November 2th 2020 to March 10th 2021 to evaluate nurses' knowledge and attitudes about the prevention of the Covid-19 at emergency units in government hospitals in the city of Baghdad / Iraq. The study sample was purposive (non-probability) sample (Eight hundred and seventeen) nurses, By the Self-administered questionnaire (SAQs) method; data of the study were collected. The survey was included all three major governmental health institutions hospitals (AlRusafa, Alkarkh, and Medical city) in Baghdad city / Iraq.
Results: The results demonstrated the significant relationship between nurses' knowledge level and variables of age group, experience in work, sites of Hospitals and female gender. Also, the study indicated that insufficient knowledge of the participants and a high positive level of their attitudes regarding the prevention of Covid-19 in emergency units in the city of Baghdad. However, the overall assessment of the knowledge and attitudes of the nurses was high when it was computed together.
Conclusion: The nurses at emergency units (front lines) haven't sufficient knowledge about Covid-19 and its prevention, which affects their preparations in the fight against the epidemic.
Recommendations: The study recommends that nurses develop their knowledge and continue to improve positive attitudes about infection prevention and control towards Covid-19.
Keywords: Evaluation, coronavirus disease-2019 (COVID-19), nurses, knowledge and attitudes, infection and prevention and control, emergency units.

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* Doctoral student \ Community Health Department \ Faculty of Nursing \ University of Baghdad \ Iraq. Email:tearandsmile.35@gmail.com.
** Assist., Prof. \ Basic Sciences Department \ Faculty of Nursing \ University of Baghdad \ Iraq.
Email: drwissamjk@conursing.uobaghdad.edu.iq. & Email: drwissamjk@yahoo.com.
*** Assist., Prof. \ Community Health Department \ Faculty of Nursing \ University of Baghdad \ Iraq.

Email: nagham_os88@conursing.uobaghdad.edu.iq. & Email: nagham_os88@yahoo.com.

INTRODUCTION

A novel corona virus 2019 (C0vid-19) is a highly destructive contagious disease of serious public health concern that is increasingly developing and spread at an alarming rate in different countries worldwide and it continues currently the deadliest coronavirus in this 21st century worldwide [(1)]. Since December 2019, an increasing number of cases of novel coronavirus infected pneumonia (NCIP) have been identified in Wuhan, a big city of 11 million people in the central the Republic of China [(2, 3)].

On August 7 in 2021 yrs. the total prevalence rate of infected cases is estimated that 4,282,732 and the overall death rate reached 3,418,084 individuals globally. Iraq's share with prevalence was 1,704,363 infected cases, and the number of deaths was 19,146 individuals [(4)].

In addition to mortality and morbidity effects, the Covid-19 pandemic crisis has had devastating effects on the global economy, especially on poor and developing countries. The entire food production sector, especially aquaculture, was negatively damaged by the Covid-19 closure periods [(5)]. The Covid-19 outbreak has had a significant influence on education at all levels, as universities have shuttered their doors and countries have locked their borders in reaction to lockdown related preventive measures [(6)].

Covid-19 is a novel member of the CoV's family, which includes a significant number of enveloping, positively and single-stranded ribonucleic acid (RNA viruses) [(7)]. Corona viruses circulate in nature in various animal species, but some of them can also be transmitted to, and among mammals including the human [(8)]. The major route of transmission of this virus is from person to person via respiratory droplets and direct personal and physical contact within the community setting as indicated by currently available shreds of evidence [(9, 3)].

This person to person transmission route can be through respiratory droplets which can be enhanced by bodily contact through a handshake, hugging, kissing and sex due to close physical contact. Similarly, corona virus-19 can be released in respiratory droplets through sneezing and coughing. When the respiratory droplets released come in contact with the mucous membrane of the eyes, nose and mouth of an individual directly or indirectly through contaminated agents and surfaces (such as automated teller machines and note currencies, electronic gadgets including phones and laptops, door handles and handrails, lift or elevator buttons and fomites including clothes, utensils and furniture), an infection may likely occur [(10, 11)].

Recently, coronavirus 19 has been confirmed in stool samples which suggest that the virus can be transmitted in other ways such as fecal-oral route transmission [(12, 13)]. Though all age groups including infants, children, grown up and elderly exposed to the virus are susceptible, patients with the lower immune system such as the elderly and those with other underline diseases (immunocompromised) are more prone to developing infections and complications and this may lead to fatality particularly in older ones [(14, 15)]. Covid-19 can develop into a mild and severe infection which may eventually result in death if there is no immediate treatment [(11)] apparently, Covid-19 is usually asymptomatic in the first few days of the incubation period which may extend to 14 days [(9, 16, and 14)], and thereafter, symptoms begin to reflect. Fever, trouble breathing or dyspnea, dry cough, tiredness, sore throat are some common primary symptoms that can range from moderate to severe cases, in addition to occasional diarrhea and temporary loss of taste and smell senses [(16, 14)]. Moreover, several studies also suggest that Covid-19 is connecting with a prothrombotic condition that leads to poor clinical health results [(17)].

The significant infectious disease risks exist in emergency care that can carry substantial clinical consequences for both patients and healthcare personnel [(18, 19)]. In the context of the Covid-19 outbreak, HCWs face an unprecedented occupational risk of morbidity and

mortality [20]. Opportunities abound for contamination of environmental surfaces and medical equipment in the emergency departments or units (ED's). Patients colonized or infected with infectious disease, can transfer microorganisms to their gowns, linens, guard rails, over bed tables, blood pressure cuffs, the floor, and many other sites in their immediate vicinity [18, 19]. In fact, ED's health staff members have been reported to be at a higher risk for infection than staff members in other hospital departments [21, 22].

One of the studies that were interested in the risk of ED's nurses' exposure to infection demonstrated that ED's nurses' had the highest rate of observed Covid-19 infected 11.1% positive compared to 1.8% of attending physicians and 3.1% of residents and fellow physicians. On average, the study also reported that nurses spending their time in contact with the patient more than other healthcare workers (HCWs). Moreover, during the two weeks of participants' recruitment, the daily frequency of the Covid-19 positivity test among HCWs and emergency units took the top of the ranking infected units [23].

Knowledge directly effects on apply of infection precautions. One study aimed to evaluate the level of nurses' knowledge, degree of compliance and other associated factors towards compliance with infection prevention and control measures (IPC) among nurses. The study demonstrated that high positive correlation between compliance to apply standard precautions and the variable of knowledge [24]. In addition, the attitudes of health care providers influence not only their behavior but also societal behavior and motivate them to reduce various unhealthy behaviors' [25].

The WHO recommends the prevention of spread and infectious outbreaks by protecting HCWs' and patients close contacts. Primary preventive measures include regular hand washing, physical distancing, and respiratory hygiene including covering the mouth and nose while coughing or sneezing and other preventive measures [26].

Finally, this study can demonstrate the level of nurses' preparedness to struggle with Covid-19 prevention during outbreak disease by the evaluate nurses' knowledge and attitudes about Infection prevention and control regarding Covid-19 in government hospitals in Baghdad city.

AIMS OF THE STUDY

This study aims to evaluate the level of nurses' knowledge and attitudes about infection prevention and control concerning Covid-19 in emergency units of government hospitals in Baghdad city / Iraq.

METHODOLOGY

- **Study Design and Study Sample**

A cross-sectional descriptive study based on survey design was included purposive population sampling of 817 nurses and conducted through the period of November 2th 2020 to 10 March 10th 2021 in-order to evaluate nurses' knowledge and attitudes about the prevention of the Covid-2019 at emergency units in government hospitals in the city of Baghdad / Iraq.

- **Study Setting**

The survey was carried out at emergency units in government hospitals in Baghdad city. The study excluded emergency units in isolation hospitals which specifically designated to receive Covid-19 cases. The place of the study included 25 hospitals in three major governmental health institutions hospitals (AlRusafa, Alkarkh, and Medical city) in Baghdad city which are receiving any emergency cases.

- **Study Instrument**

Currently, the not available structure of questionnaire specific and ready to evaluate nurse's knowledge and attitudes toward infection prevention and control regarding pandemic

of Covid-19 in emergency units, therefore, an instrument was developing in a form of a close-ended questionnaire through an intensive literature review regarding coronavirus, IPC standard of epidemic-and pandemic-prone acute respiratory infections in health care [(27)], and WHO guidance of infection prevention and control during health care when Covid-19 cases are suspected [(28)] and other guidance related to Covid-19 prevention [(29, 30, 31, and 32)] and also, standards of infection prevention and control followed in Iraq ministry of health [(33)]. Also, we used part of the guidelines for the study of knowledge, attitudes and practice (KAP)" template, which is a framework for creating and distributing knowledge questions [(34)]. Nurses' attitudes were evaluated through a questionnaire which is consisting of 12 items.

Attitudes questionnaire structure can be described in terms of three components that are represented in what is called the ABC (Affect, Behavior and Cognition) model of attitudes [(35, 36)].

The instrument is composed of (35) items; it is divided into three major parts as follows:
Part I: demographic characteristics with the addition of the history of exposure to Covid-19 and Level concerning Covid-19 training related to infection prevention and control (7-Items).
Part II: Knowledge of nurse's staff toward Covid-19 infection prevention and control (16-Items).
Part III: Attitudes of nurses staff toward Covid-19 infection prevention and control (12-Items).

RESULTS:

Table (1): shows distribution of studied nurse staff socio-demographical characteristics variables (SDCv.).

General (SDCv.)	Groups	No.	%	C.S. P-value
Age Groups	20 _	356	43.6	χ^2= 182.70 P=0.000 (HS)
	30 _	204	25.0	
	40 _	166	20.3	
	50 _ 60	91	11.1	
	Mean ± SD	31.42 ± 6.96		
Gender	male	316	38.7	P=0.000 (HS)
	female	501	61.3	
Level of Education	Other	12	1.5	χ^2= 1046.97 P=0.000 (HS)
	Secondary	484	59.2	
	Diploma	258	31.6	
	Collage	60	7.3	
	Higher education	3	0.4	
Experience in work	≥ 1 years	26	3.2	χ^2= 307.36 P=0.000 (HS)
	1-5 years	326	39.9	
	6-10 years	166	20.3	
	11-15 years	102	12.5	
	≤16 years	197	24.1	
Social status	Single	247	30.2	χ^2= 867.42 P=0.000 (HS)
	Married	531	65	
	Widower	7	0.9	
	divorced	32	3.9	

Table 1 shows nurse staff socio-Demographical characteristics (SDCv.) variables

Figure (1): Bar Charts plots for the Distribution of Socio-Demographical Characteristics variables of the Studied Sample

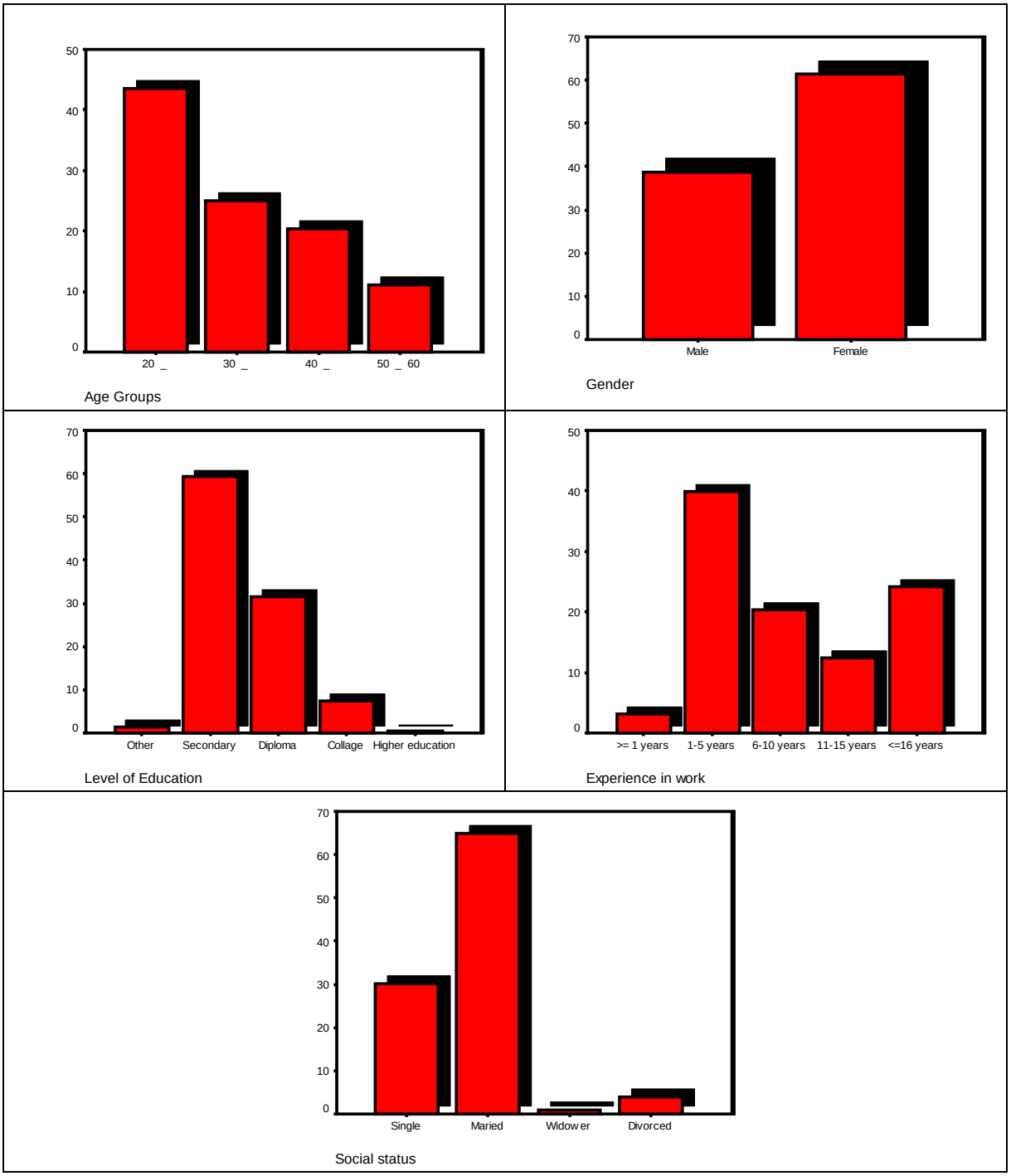


Table (2): Summary statistics for studied sub and main domains related to nurse's knowledge and attitudes concerning Covid-19 at the "Emergency Units at Government Hospital's"

Sub & Main Domains	No.	Min.	Max.	PGMS	PSD	Ev.
Signs and Symptoms	817	0.00	100	84.09	36.60	H
Transmission and prognosis	817	0.00	100	60.34	31.80	M
Diagnosis	817	0.00	100	59.36	36.81	M
Knowledge about Covid19	817	0.00	100	67.93	21.34	H
Hand hygiene	817	0.00	100	59.42	34.87	M
Standard precautions and (PPE)	817	0.00	100	62.03	20.20	M
Waste Management	817	0.00	100	58.32	34.45	M

Isolation Precautions	817	0.00	600	73.68	38.73	H
Knowledge about Prevention	817	10	197.5	63.37	19.13	M
Knowledge	817	11.25	100	65.65	15.72	M
Attitudes	817	0.00	100	74.00	13.16	H
Overall Evaluation	817	21.04	96.67	69.8	11.32	H

EV: Evaluated (0.00 – 33.33) Low (L); (33.34 – 66.66) Moderate (M); (66.67– 100) High (H)

Table (2) shows the results of the overall evaluation of nurses' knowledge subdomains into an overall evaluation.

Figure (2): Bar Charts for (Grand/Global) percentile transformation regarding mean of score for sub and main domains related to nurse's knowledge and attitudes of Covid-19 at "Emergency Units at Government Hospital's"

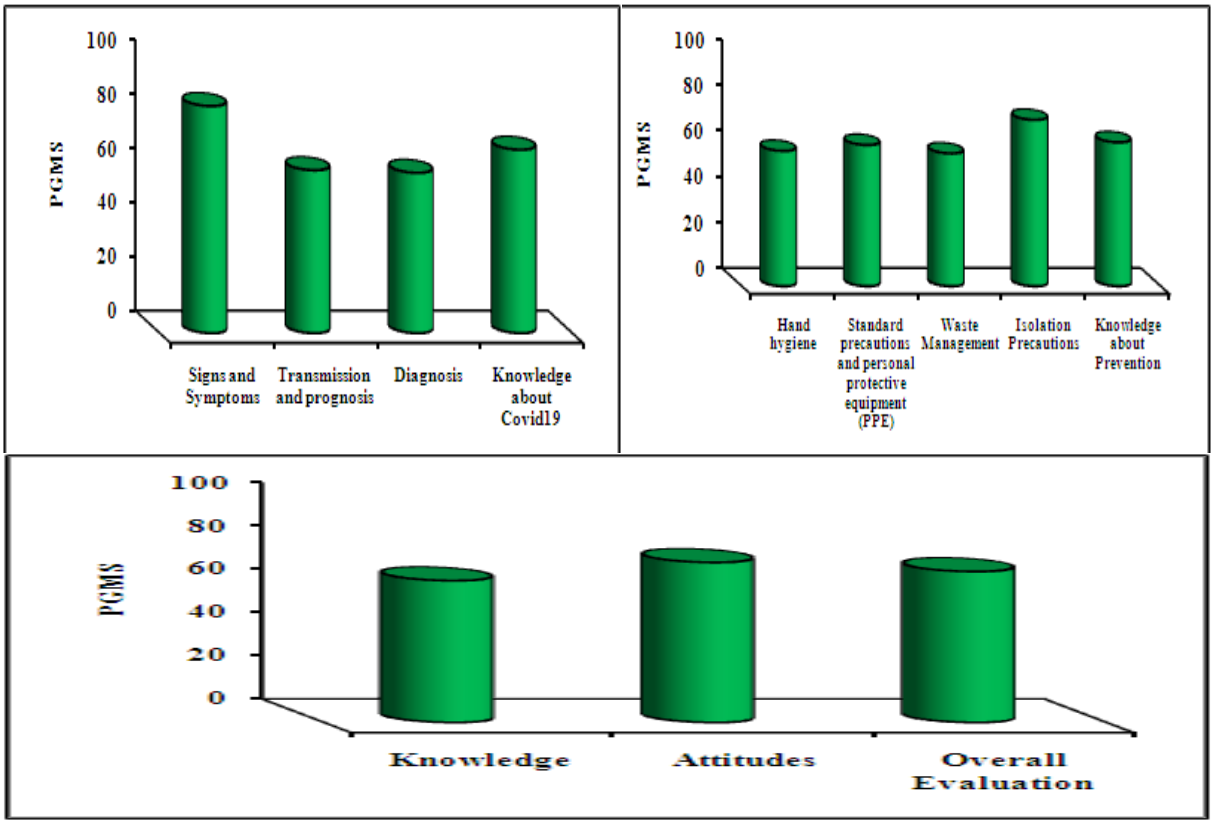


Table (3): Relationships among providers' responding regarding studied domains: [Knowledge and Attitude, and Overall Attitudes] responding and their (SDCv.)

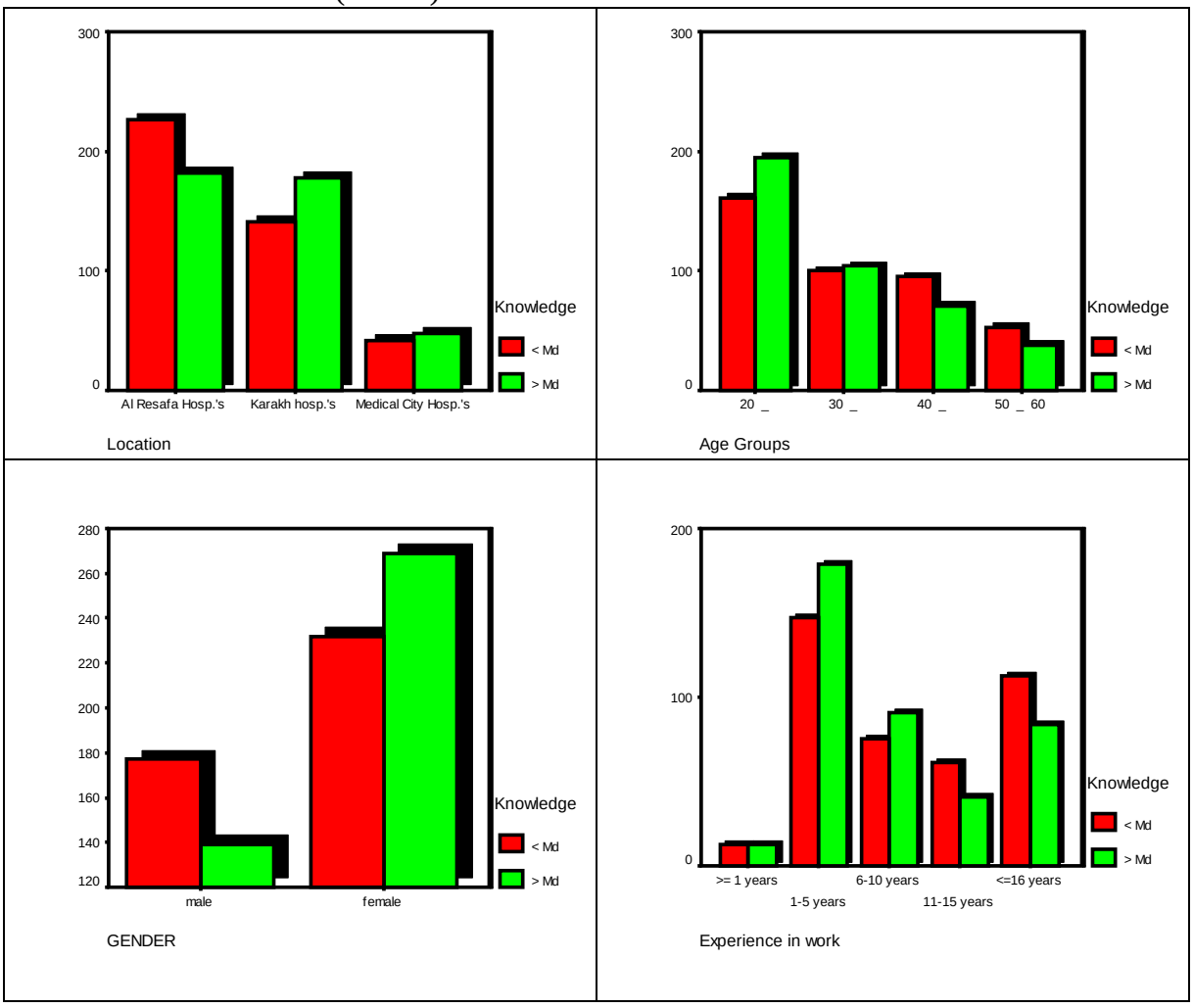
Demographical Characteristics and some related variables	Knowledge			Attitudes			Overall Evaluation		
	C.C.	Sig.	C.S.	C.C.	Sig.	C.S.	C.C.	Sig.	C.S.
Sites of Hospitals	0.107	0.009	HS	0.069	0.141	NS	0.027	0.740	NS
Age Groups	0.106	0.026	S	0.059	0.416	NS	0.004	1.000	NS
Gender	0.094	0.007	HS	0.055	0.114	NS	0.021	0.549	NS

Level of Education	0.094	0.125	NS	0.069	0.412	NS	0.090	0.153	NS
Experience in work	0.125	0.012	S	0.053	0.683	NS	0.044	0.810	NS
Social status	0.093	0.068	NS	0.061	0.384	NS	0.019	0.958	NS

HS: Highly Sig. at P<0.01; NS: Non Sig. at P>0.05; S: Sig. at P<0.05; Testing are based on a Contingency Coefficient test.

Table (3) shows relationships between knowledge and attitudes studied domains of nurses and the variables of their SDCv.

Figure (3): Bar Charts plots distribution among "Nurses' knowledge, and attitudes" regarding studied domains and their (SDCv.)



DISCUSSION

- Nurse staff socio-Demographical characteristics (SDCv.) variables

In table (1) the age variable was calculated through distributed and integrated into groups classes of "Age Groups", and most of our study participants were in the age groups between 20 – 39 yrs.' with mean and standard deviation 31.42, and 6.96 which represents more than 68.8% of respondents. In addition, most of the studied respondents were female and they represent 61.3%, whereas, concerning experience in work, it shows that two-third of studied subjects had less than 10 yrs.' experience, and they are accounted for represents the percentage of 63.40%, figure (1).

These results are similar to other results of survey study, one of these studies was by Alyaemni and Alhudaithi were sought to identify the prevalence and pattern of workplace violence and the consequences of violence on nurses working in emergency departments in Riyadh where part of demographic results showed that most nurses participant were females 82.6% of the study, and the dominant factor of experience had worked in nursing was less than ten years represents 87.6%, while most age groups responded to the study were under 39 years ago with percent 94% of the study [(37)].

In addition, most of the studied subjects having secondary and diploma, and they represent 90.82% of the study participants, also the study reported that more than half of the studied responds are married, they represent 65% of study respondents.

These results can interpret by due to mostly the nature of professional educational nursing programs outcomes predominant in our country including secondary schools and diploma nursing until the recent years, moreover to nursing bridging programs. With concerning the result of marital status, this normally results because most of the respondents are of marriageable age from 20 to 39 years.

- **Nurses' knowledge related to Covid-19 infection prevention and control**

Table (2) shows the results of the overall evaluation of nurses' knowledge subdomains into an overall evaluation. The overall evaluation reported that nurses' have a moderate level of knowledge at (65.65) about Covid-19 prevention.

This may be due to the emergent nature of this public health crisis, the rapid spread, and the work environment in ED's with a lack of nurses with special training in Covid-19 measures.

This result can support evidence by similar past results were found in a study of the survey was performed at hospitals of three cities in Saudi Arabia in 2015. This survey aimed to assess the knowledge, attitudes, infection control practices, and educational needs of HCWs. 1216 HCWs were included in this survey, per cent of 68.9% of them were nurses. The study also concluded that insufficient knowledge with poor to a moderate level about the Middle East respiratory syndrome coronavirus (MERS-CoV) infection and there is a need for further education and training programs particularly in the use of personal protective equipment, isolation, and infection control measures [(38)].

- **Nurses' Attitudes related to Covid-19 infection prevention and control**

With regard to the observed domain of nurses' attitudes table (2), the results show that they have a high level of attitudes with a percentile (grand/or global) mean of the score at (74.0) toward prevention and control of Covid-19 infection, figure (2).

These results are similar for many studies one of these studies was a study conducted by Zhenjiang and others in 2020. A survey was conducted included1323 nurses in Wuhan hospitals in 2020 about basic information Knowledge's, attitudes, and practices of nurses regarding prevention measures Covid-19, it's including subjects about Covid-19 and prevention measures such as the characteristics of covid19, dealing with susceptible cases, standard prevention precautions, isolation, hand hygiene, personal protective equipment, waste disposal, hand hygiene, pre-diagnosis, triage and other subjects related to Covid-19 prevention. The results of this study demonstrated that respondents had a high score in attitudes level and indicated that they have positive attitudes towards the prevention and control of hospital infection [(24)].

Despite the evaluation results of our study which presented a moderate level result in nurses' knowledge main domain related to Covid-19 prevention and control, however, the result of the overall evaluation for the two domains knowledge and attitudes when calculated together by the percentile grand main domain was in a high level (69.8) [(39, 24)].

This result can be supported through many similar results of other survey studies. One of these was a study about HCW's are working at the frontline defense against the Covid-19

pandemic. A descriptive cross-sectional study was done sought to evaluate knowledge and attitudes among HCW's which can directly influence practices and lead to poor infection control practices, and the spread of disease. The study included a large number of nurses at different hospital types in the Al-Fayum governorate in Egypt. The overall evaluation result of the study's HCW's knowledge and attitudes together showed that the participants had a good level in the overall evaluation of the total main domains [(40)].

- **Relationships among providers' responding regarding studied domains knowledge and attitude and the variables of their socio-demographic characteristics**

Table (3) shows relationships between knowledge and attitudes studied domains of nurses and the variables of their SDCv. the study found significant relationships between nurses' knowledge and studied variables of the three government institutions sites, age groups, and experience years at $P<0.05$ level, while the rest variables have recorded no significant relationships, figure (3).

The significant statistical relationship between locations studied and knowledge variable domains are due to the differences in results of evaluating the level of main domains nurses' knowledge among the three studied sites. In addition, the study showed that there is an association between the result of overall knowledge level and age groups less than-30 of nurse's respondents who have experiences from 1-10 years.

There are many results of studies that had similar results, in which the participants had similar age and experience this study and showed poor to a moderate level of knowledge related to controlling infectious diseases, which demonstrates the importance of age-related experiences in knowledge about hospital infection control.

One of these studies was a descriptive correlational study survey to assess the knowledge related to the prevention of nosocomial infections and practices among staff nurses in many selected hospitals. The results show that the majority (88.3%) of subjects was in the ages of less than 30 years and (98.4%) were having less than 9 years of professional experience, and they were demonstrated that the majority of (95%) the staff nurses were having an average knowledge level related to prevention nosocomial infections [(41)].

CONCLUSION

In conclusion, the results have shown that the participants had inadequate moderate knowledge levels, while attitudes were positive and in high-level evaluation. These results indicated that nurses in one of the frontline healthcare systems (ED's) have insufficient knowledge about the disease and how to prevent it. This result of knowledge was associated with those who have less experience and with an age group less thirty-nine years. This may be due to the lack of information about the novel virus and its sudden and confusing emerging.

RECOMMENDATION

The study recommends that nurses should develop their knowledge about infection prevention and control towards Covid-19 and continue to improve positive attitudes to support struggle efforts against this pandemic.

- **LIMITATIONS:**

- Many nurses were refusing to participate in this study.
- Nurses are usually busy due to the workload in emergency units.

- **ETHECAL CONSIDRATIONS:**

- Approval of the Iraqi Ministry of Health and Ministry of Planning.

- All the participants were fully informed regarding the background of the study and the nature of their involvement before the commencement of their participation and then getting approval them in the study.
- Eligible nurses' participation in this survey was voluntary and was not compensated.
- Confidentiality of responders' information maintained throughout the study by making participants' information secret and asking participants to provide honest answers.

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