

The Anesthesiologist assistants' Role in the Management of Patients Undergoing General Anesthesia

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ABSTRACT

Background: The present study designed as a descriptive one, was carried on 57 anaesthesiologist assistants and 18 anesthesiologists at operating rooms in four hospitals in Al Anbar govern including Al- Ramadi Teaching Hospital, Al-Ramadi Teaching Hospital for Maternity and Children, Al-Razi Hospital and Al -Safwa Hospital.

Aim: This study was to determine the role of anesthesiologist assistant for the care of patients undergoing general anesthesia.

Methods: Data were collected using an anesthesiologist assistant's role opinion.

Results: The result of this study revealed that the majority of the anesthesia assistants and anesthesiologists from all hospitals agreed about the role to be delegated to the anesthesiologist assistant's during the preoperative phase, the preinduction of anesthesia toward equipment and patient, the induction and maintenance of anesthesia, and during the emergency period. The majority the anesthesia assistants and anesthesiologists agreed about anesthesia courses containing knowledge and skills to be included in any educational program during the basic study, post basic and on the job and the majority reported that, it should be given by specialists from the medical and nursing staff, two years after Diploma of Technical Medical Institute of Anesthesia plus training in the anesthetic field were and reported by more than any other qualifications from both anesthesia assistants and anesthesiologists. The anesthesiologist assistant should work interdependently and must work under the direction and supervision of anesthesiologist.

Conclusions: It is concluded that the anesthesiologists and operating room assistants agreed about the role of an anesthesiologist assistant's during the perioperative phases of general anesthesia.

Recommendation: The study recommended different strategies to enhance an anesthesiologist assistant's knowledge and practice related to general anesthesia in the operating room.

Keywords: Anesthesia; Anesthesiologist; Anesthesiologist Assistant's.

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INTRODUCTION

Meeting the goals of a reformed healthcare system requires the expertise of professionals, especially those with specialized knowledge and skills. In the instructed health care system, Anesthesiologist assistant's prepared for anesthesia is considered to be unique and valuable providers¹. The concept of anesthesiologist assistant's is the healthcare professionals who specialize in administering anesthesia to patients before, during, and after medical procedures or surgeries. Their primary role is to ensure patient safety and comfort by managing pain, maintaining vital functions, and monitoring the patient's condition throughout the procedure. In North America and the United Kingdom, respectively, when anesthesiologist assistants who had completed courses and implies a level of knowledge and skill in anesthesia system which is acquired during the courses of basic anesthesia education². The specific roles and responsibilities of anesthesiologist assistant's may vary slightly between different world and Arab countries, depending on the local healthcare system and regulatory frameworks. However, the overall objective remains the same: to ensure the safe and effective administration of anesthesia and the well-being of patients during surgical procedures³. A study conducted in Iraq aimed to determine and understand the quality of life among anaesthesiologist assistants who were coping with COVID-19 and non-COVID-19 intensive care units. The study enrolled 1,100 anaesthesiologist assistants working at the time of the COVID-19 outbreak in treatment centers in different regions of Iraq. The results showed that the mean SF-36 score was 65.2, with a lower mean score of the mental component summary than the physical component summary⁴. He⁵ added study conducted in Iraq aimed to explain that anesthesiology assistant's work collaboratively with physician anesthesiologists to provide the highest level of patient care in clinical settings. However, this study is not specific to Iraq and anesthesia provider also include Anesthesia Technician in Iraq does not provide specific information about the role⁶. A job description fact sheet from the University of Colorado Denver explains that anesthesiology assistants are qualified by academic and clinical education to provide anesthetic care under the direction of a qualified physician anesthesiologist⁷.

MATERIAL & METHODS

Research Design:

A descriptive research design was utilized in this study that was portrayed under four main designs as follows:

1. Technical Design
2. Operational Design
3. Administrative Design
4. Statistical Design

Technical Design: The technical design of the study includes setting, target population and tool for data collection.

Setting: The study was carried out in the operating rooms of the following hospitals:

- Al- Ramadi Teaching Hospital
- Al-Ramadi Teaching Hospital for Maternity and Children
- Al-Razi Hospital
- Al -Safwa Hospital

Target Population: The study population was divided into two groups:

Group (A): Consisted of all available anesthetic physicians working in the operating rooms in the above-mentioned settings. These were 18 anesthesiologists distributed as following:

- 5 from Al Ramadi Teaching Hospital
- 5 from Ramadi Teaching Hospital for Maternity and Children
- 4 from Al-Razi Hospital
- 4 from Al -Safwa Hospital

Group (B): Consisted of all available anesthesiologists' assistants working in the operating rooms of the above-mentioned settings. They were 57 anesthesiologists' assistants distributed as following:

- 23 from Al Ramadi Teaching Hospital
- 11 from Ramadi Teaching Hospital for Maternity and Children
- 12 from Al-Razi Hospital
- 11 from Al -Safwa Hospital

Inclusion Criteria: (for both anesthesiologists and anesthesiologists' assistants):

- Male and female
- Had at least three years' experience in operating room.

Study Tool: It is a structured interview sheet developed by Heather Douglass (2018) based on review of literature and international standards of anesthesiologists' assistants and modified by the researcher to determine anesthesiologist's and anesthesiologists' assistants opinion about the role of anesthesiologists' assistants in the care of patients undergoing general anesthesia. This tool includes following parts.

Part (1): It includes items related to socio demographic characteristics such as age, workplace, qualifications, positions, years of experience and previous attendance of training program related to general anesthesia.

Part (2): Includes items related to the role of anesthesiologists' assistants for patient undergoing general anesthesia during preoperative, intraoperative and postoperative phases.

Preoperative Phase: It includes items related to anesthesiologist assistant role during the preoperative phase.

Intraoperative Phase: It items related to anesthesiologist assistant role during Intraoperative phase.

Postoperative Phase: It includes items related to anesthesiologist assistant role during postoperative phase.

Scoring System: For anesthesiologist assistant and physicians' impact, a checked answer was scored "one" for (Yes) and the unchecked (No) answer was scored "zero". The scores of the items were summed up and the total divided by the number of the items, the score was converted into a percent score.

Operational Design: It includes preparatory phase, content validity, pilot study and fieldwork.

Preparatory Phase: It includes reviewing of literature, previous studies and theoretical knowledge of various aspects of the problem using books, articles, and Internet, periodicals magazines in order to develop the tools.

Content Validity: It was ascertained by 5 expertises from anesthetic physicians having at least 3 years of experience in operating rooms and accordingly modifications were done.

Pilot Study: A pilot study was carried out over a period of 4 days. It was applied on 10% of the study sample (two anesthesiologists and five anesthesiologist assistant) to test the feasibility of the study and clarity of the questions and the necessary modifications were done.

Fieldwork: Data were collected within 6-month period starting from the beginning of August 2022 till the end of February 2023. The researcher interviewed all anesthesiologist assistant and physicians in operating rooms in individual base, during three shifts, morning, afternoon and evening for three days per week. Two to three anesthesiologist assistants and physicians were interviewed per day, by the researcher who first introduced his self and explain the objective of the study. The sheets were distributed to anesthesiologist assistant and physicians and the researcher asked them to complete the sheets. Each interview lasted for 20-25 minutes depending on the interviewee's responses.

Administrative Design: An official permission to conduct the study was obtained from the Directors of the mentored study sample after explanation of the purpose of the study. Anesthesiologists and anesthesiologist assistants consent for participation were obtained after explanation of the objectives of the study.

RESULTS

(PART I)

Table 1 shows the distribution of anesthesia assistants and physicians in all hospitals according to their socio demographic characteristics

Regarding to age, slightly more than half of the total studied anesthesia assistants (50.9%) were in the age group 30-<40, while 66.7% of all physicians had 40 years

or more. As regards sex, the majority of total anesthesia assistants were females in all settings (89.5 %). In addition this table shows that, majority of the physicians (88.9%) were males.

Concerning qualification, 78.9% of total studied anesthesia assistants had Diploma of Technical Medical Institute of Anesthesia, while the majority of total studied physicians (88.9%) had master degree in anesthesia. In relation to position, more than three quarters of total studied anesthesia assistants from all hospitals were operating room anesthesia assistants (77.2%), while all studied physicians are doctors.

Considering the years of experience, only 49.2% of total studied anesthesia assistants had experience 15 years or more, while 14.0% of total anesthesia assistants had experience from 10 -< 15 years, and more than three fifths (61.1%) of the total studied physicians had experience 15 years or more.

The results also revealed that only minorities of anesthesia assistants, working in Al-Ramadi Teaching Hospital (8.7%), Al- Ramadi Teaching Hospital for Maternity and Children (27.3%), Al-Razi Hospital (8.3%) had previous training programs related to general anesthesia, while none of the anesthesia assistants working in Al Safwa Hospital had any training. On the other hand, all of the studied physicians in all settings had previous training in general anesthesia as illustrated by Table 1.

(PART II)

Table 2 and Figure 1 show anesthesia assistants' and physicians' opinions regarding the anesthesiologist assistant role during preoperative phase

The results revealed that less than two thirds of total studied anesthesia assistants' and physicians, agreed about all items related to the role of anesthesiologist assistant during the preoperative phase. The table shows that less than two thirds of total studied anesthesia assistants', and more than three quarters of total studied physicians agreed about most items related to the role of anesthesiologist assistant as regards assessing and recording physical condition of the patients, except for item related to weight was reported by less than half the anesthesia assistants in Al-Razi Hospital (41.4%), and (45. 5%) in Al- Safwa Hospital. In addition to height was reported by 41.7% in Al-Razi Hospital, also habits (narcotics alcohol, cigarettes), allergies, intake of medications, previous disease history and previous anesthesia (type & any reactions) were agreed by 40.0% of physicians in Ramadi Teaching Hospital. As for assessment and recording of psychological condition of the patient less than three quarters (72.2%) of total physicians and (73.7%) of total anesthesia assistants' agreed about this item.

Table 2 considering providing psychological support and assurance also reveals that the item related to answer or look for the answers of any question was agreed to

Table 1. Distribution of operating room anesthesia assistants and anesthesiologists' in all hospitals according to their socio demographic characteristics.

| Items | RTH | | | | RTHMC | | | | RH | | | | SH | | | | Total | | | | |
|---|----------------------------------|-----|----------------------|-----|--------------------------------|-----|----------------------|-----|----------------------------------|-----|----------------------|-----|---------------------------------|------|----------------------|-----|---------------------------------|------|-----------------------|------|--|
| | Anesthesia assistants (n= 23) | | Physicians (n= 5) | | Anesthesi assistants (n=11) | | Physicians (n= 5) | | Anesthesia assistants (n= 12) | | Physicians (n= 4) | | Anesthesia assistants (n=11) | | Physicians (n= 4) | | Anesthesia assistants (n=57) | | Physicians (n= 18) | | |
| | No | % | No | % | No | % | No | % | No | % | No | % | No | % | No | % | No | % | No | % | |
| Age | | | | | | | | | | | | | | | | | | | | | |
| >20 | 1 | 4.3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 18.2 | 0 | 0 | 3 | 5.3 | 0 | 0 | |
| 20<30 | 4 | 17 | 2 | 40 | 5 | 46 | 0 | 0 | 1 | 8.3 | 0 | 0 | 7 | 63.6 | 0 | 0 | 17 | 29.8 | 2 | 11 | |
| 30<40 | 12 | 52 | 0 | 0 | 4 | 36 | 1 | 20 | 11 | 92 | 3 | 75 | 2 | 18.2 | 0 | 0 | 29 | 50.9 | 4 | 22 | |
| 40+ | 6 | 26 | 3 | 60 | 2 | 19 | 4 | 80 | 0 | 0 | 1 | 25 | 0 | 0 | 4 | 100 | 8 | 14 | 12 | 67 | |
| Sex | | | | | | | | | | | | | | | | | | | | | |
| Male | 1 | 4.3 | 5 | 100 | 1 | 9.1 | 5 | 100 | 4 | 33 | 2 | 50 | 0 | 0 | 4 | 100 | 6 | 10.5 | 16 | 89 | |
| Female | 22 | 96 | 0 | 0 | 10 | 91 | 0 | 0 | 8 | 67 | 2 | 50 | 11 | 100 | 0 | 0 | 51 | 89.5 | 2 | 11 | |
| Qualifications | | | | | | | | | | | | | | | | | | | | | |
| Doctorate of anesthesia | 0 | 0 | 1 | 20 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 25 | 0 | 0 | 2 | 11 | |
| Master of anesthesia | 0 | 0 | 4 | 80 | 0 | 0 | 5 | 100 | 0 | 0 | 4 | 100 | 0 | 0 | 3 | 75 | 0 | 0 | 16 | 89 | |
| Diploma of Technical Medical Institute of Anesthesia | 21 | 91 | 0 | 0 | 8 | 73 | 0 | 0 | 9 | 75 | 0 | 0 | 7 | 63.6 | 0 | 0 | 45 | 78.9 | 0 | 0 | |
| Diploma of Technical Institute of Nursing | 2 | 8.7 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 25 | 0 | 0 | 2 | 18.2 | 0 | 0 | 7 | 13.2 | 0 | 0 | |
| BSC of Nursing | 0 | 0 | 0 | 0 | 3 | 27 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 18.2 | 0 | 0 | 5 | 8.8 | 0 | 0 | |
| Position: | | | | | | | | | | | | | | | | | | | | | |
| Head nurse | 3 | 13 | 0 | 0 | 1 | 9.1 | 0 | 0 | 1 | 8.3 | 0 | 0 | 1 | 9.1 | 0 | 0 | 6 | 10.1 | 0 | 0 | |
| Technical anesthesia | 2 | 8.7 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 25 | 0 | 0 | 2 | 18.2 | 0 | 0 | 7 | 12.3 | 0 | 0 | |
| Doctorate of anesthesia | 0 | 0 | 5 | 100 | 0 | 0 | 5 | 100 | 0 | 0 | 4 | 100 | 0 | 0 | 4 | 100 | 0 | 0 | 18 | 100 | |
| Anesthesia Assistants | 18 | 78 | 0 | 0 | 10 | 91 | 0 | 0 | 8 | 67 | 0 | 0 | 8 | 72.7 | 0 | 0 | 44 | 77.2 | 0 | 0 | |
| Years of experience | | | | | | | | | | | | | | | | | | | | | |
| 3<5 | 1 | 4.3 | 2 | 40 | 4 | 36 | 1 | 20 | 2 | 17 | 1 | 25 | 4 | 36.4 | 0 | 0 | 11 | 19.3 | 4 | 22 | |
| 5<10 | 4 | 17 | 0 | 0 | 2 | 18 | 1 | 20 | 0 | 0 | 2 | 50 | 4 | 36.4 | 0 | 0 | 10 | 17.5 | 3 | 16,7 | |
| 10<15 | 2 | 8.7 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 33 | 0 | 0 | 2 | 18,2 | 0 | 0 | 8 | 14 | 0 | 0 | |
| 15+ | 16 | 70 | 3 | 60 | 5 | 45 | 3 | 60 | 6 | 50 | 1 | 25 | 1 | 9 | 4 | 100 | 28 | 49,2 | 11 | 64 | |
| Previous attendance of training programs related to general anesthesia | | | | | | | | | | | | | | | | | | | | | |
| | 2 | 8.7 | 5 | 100 | 3 | 27 | 5 | 100 | 1 | 8.3 | 4 | 100 | 0 | 0 | 4 | 100 | 6 | 10.5 | 18 | 100 | |

MCp : p for Monte Carlo test

FEP: p value for Fisher Exact test*

*Statistically significant at $p \leq 0.05$

RTH; Al-Ramadi Teaching Hospital

RTHMC : Al- Ramadi Teaching Hospital for Maternity and Children

RH : Al-Razi Hospital

SH: Al -Safwa Hospital

Table 2. Anesthesia assistants and physicians' opinions regarding anesthesiologist assistant role during (pre-operative).

| Items | RTH | | | | RTHMC | | | | RH | | | | SH | | | | Total | | | | FEp |
|--|-------------------------------|----|-------------------|------|------------------------------|-------|-------------------|-----|-------------------------------|------|-------------------|-----|------------------------------|------|-------------------|-----|------------------------------|------|--------------------|------|-------------------------------------|
| | Anesthesia assistants (n= 23) | | Physicians (n= 5) | | Anesthesia assistants (n=11) | | Physicians (n= 5) | | Anesthesia assistants (n= 12) | | Physicians (n= 4) | | Anesthesia assistants (n=11) | | Physicians (n= 4) | | Anesthesia assistants (n=57) | | Physicians (n= 18) | | |
| | No | % | No | % | No | % | No | % | No | % | NO | % | No | % | No | % | No | % | No | % | |
| 1- Assess the physical condition of the patients and records it on anesthesia chart | | | | | | | | | | | | | | | | | | | | | |
| Age | 18 | 78 | 3 | 60,0 | 11 | 100,0 | 5 | 100 | 11 | 92 | 4 | 100 | 8 | 73 | 4 | 100 | 48 | 84 | 16 | 88,9 | 1 |
| Height | 19 | 83 | 4 | 80 | 11 | 100 | 4 | 80 | 5 | 42 | 4 | 100 | 6 | 55 | 4 | 100 | 41 | 72 | 16 | 89 | 0,200 |
| Weight | 16 | 70 | 4 | 80 | 11 | 100 | 5 | 100 | 5 | 41 | 4 | 100 | 5 | 45,5 | 4 | 100 | 37 | 65 | 17 | 94 | 0.016* |
| Skin Condition | 16 | 70 | 4 | 80 | 11 | 100 | 5 | 100 | 9 | 75 | 4 | 100 | 8 | 73 | 4 | 100 | 44 | 77 | 17 | 94 | 0.165 |
| Mobility | 18 | 78 | 3 | 60 | 11 | 100 | 5 | 100 | 9 | 75 | 3 | 75 | 8 | 73 | 4 | 100 | 46 | 81 | 15 | 83 | 1 |
| Habits (narcotics, alcohol, cigarettes) | 19 | 83 | 2 | 40 | 11 | 100 | 5 | 100 | 11 | 92 | 4 | 100 | 8 | 73 | 3 | 75 | 49 | 86 | 14 | 78 | 0.466 |
| Allergies | 20 | 87 | 2 | 40 | 11 | 100 | 5 | 100 | 11 | 92 | 3 | 75 | 8 | 73 | 4 | 100 | 50 | 88 | 14 | 78 | 0.444 |
| Intake of medications | 17 | 74 | 2 | 40 | 10 | 90.9 | 5 | 100 | 11 | 92 | 4 | 100 | 7 | 64 | 3 | 75 | 45 | 79 | 14 | 78 | 1 |
| Previous disease history | 19 | 83 | 2 | 40 | 11 | 100 | 5 | 100 | 9 | 75 | 4 | 100 | 6 | 55 | 3 | 75 | 45 | 79 | 14 | 78 | 1 |
| Previous anesthesia (type and any reactions) | 20 | 87 | 2 | 40 | 11 | 100 | 5 | 100 | 9 | 75 | 4 | 100 | 7 | 63 | 3 | 75 | 47 | 83 | 14 | 78 | 0.731 |
| Pulse rate | 21 | 91 | 3 | 60,0 | 11 | 100 | 5 | 100 | 10 | 83 | 4 | 100 | 9 | 81 | 3 | 75 | 51 | 90 | 15 | 83 | 0.441 |
| Blood pressure | 21 | 91 | 3 | 60,0 | 11 | 100 | 5 | 100 | 11 | 91,7 | 4 | 100 | 9 | 81 | 3 | 75 | 52 | 91,2 | 15 | 83 | 0,389 |
| Respiratory rate and rhythm | 20 | 87 | 3 | 60,0 | 11 | 100 | 5 | 100 | 10 | 83 | 3 | 75 | 7 | 64 | 3 | 75 | 48 | 84 | 14 | 78 | 0,499 |
| Airway potency | 19 | 83 | 4 | 80 | 10 | 90.9 | 5 | 100 | 9 | 75 | 3 | 75 | 6 | 55 | 3 | 75 | 44 | 77 | 14 | 78 | 1 |
| Level of consciousness | 18 | 78 | 3 | 60,0 | 11 | 100 | 5 | 100 | 8 | 67 | 3 | 75 | 6 | 55 | 3 | 75 | 43 | 75 | 14 | 78 | 1 |
| (2) Assess the psychological condition of the patients and record it on anesthesia chart (fear, irritability and insomnia) | 18 | 78 | 4 | 80 | 11 | 100 | 4 | 80 | 6 | 50 | 3 | 75 | 7 | 64 | 2 | 50 | 42 | 74 | 13 | 72 | 0.754 |
| (3) Provide psychological support and assurance | | | | | | | | | | | | | | | | | | | | | |
| Explain what is the meant by general anesthesia | 20 | 87 | 3 | 60 | 11 | 100 | 4 | 80 | 10 | 83.3 | 3 | 75 | 6 | 54.5 | 3 | 75 | 47 | 82.5 | 13 | 72.2 | X ² =0.895 p=0.344 |
| Answer or look for the answers of any question | 20 | 87 | 2 | 40 | 11 | 100 | 5 | 100 | 8 | 66.7 | 3 | 75 | 6 | 54.5 | 2 | 50 | 45 | 78.9 | 12 | 66.7 | X ² =1.131 p=0.288 |
| (4) Check for the presence of the following patients chart | | | | | | | | | | | | | | | | | | | | | |
| Investigations | 20 | 87 | 4 | 80 | 11 | 100 | 5 | 100 | 11 | 91.7 | 4 | 100 | 9 | 81.8 | 3 | 75 | 51 | 89.5 | 16 | 88.9 | 1 |

| | | | | | | | | | | | | | | | | | | | | | | |
|---|----|------|---|-------|----|------|---|-----|----|------|---|-----|----|------|------|-----|-----|------|----|------|-------|---|
| Informed consent | 21 | 87 | 4 | 80 | 11 | 100 | 5 | 100 | 11 | 91.7 | 4 | 100 | 9 | 81.8 | 4 | 100 | 52 | 91,2 | 17 | 94.4 | 1 | |
| Special medication | 20 | 87 | 3 | 60 | 11 | 100 | 5 | 100 | 12 | 100 | 4 | 100 | 7 | 63.6 | 4 | 100 | 50 | 87.7 | 16 | 88.9 | 1 | |
| (5) Obtain anesthesia consent and attach it to anesthesia chart | | | | | | | | | | | | | 75 | 7 | 63.6 | 4 | 100 | 50 | 87 | 16 | 88.9 | 1 |
| (6) Instruct the patient about NPO | 22 | 95.7 | 4 | 80 | 11 | 100 | 5 | 100 | 10 | 83.3 | 3 | | | | | | | | | | | |
| stop smoking | 21 | 91.3 | 5 | 100,0 | 10 | 90 | 5 | 100 | 10 | 83.3 | 4 | 100 | 9 | 81.8 | 4 | 100 | 50 | 87.7 | 18 | 100 | 0.186 | |
| (7) Removal of the following | | | | | | | | | | | | | | | | | | | | | | |
| Prosthesis | 21 | 91.3 | 5 | 100,0 | 11 | 100 | 5 | 100 | 12 | 100 | 3 | 75 | 11 | 100 | 2 | 50 | 55 | 96.5 | 15 | 83.3 | 0.086 | |
| Jewelry | 23 | 100 | 5 | 100,0 | 10 | 90 | 5 | 100 | 11 | 91.7 | 4 | 100 | 11 | 100 | 4 | 100 | 55 | 96.5 | 18 | 100 | 1 | |
| Hair Pins | 23 | 100 | 5 | 100,0 | 11 | 100 | 5 | 100 | 11 | 91.7 | 4 | 100 | 11 | 100 | 4 | 100 | 56 | 98.5 | 18 | 100 | 1 | |
| Nail polish | 23 | 100 | 5 | 100,0 | 10 | 90 | 5 | 100 | 11 | 91.7 | 4 | 100 | 11 | 100 | 4 | 100 | 55 | 96.5 | 18 | 100 | 1 | |
| Make up | 23 | 100 | 5 | 100,0 | 9 | 81.1 | 5 | 100 | 9 | 75 | 4 | 100 | 11 | 100 | 4 | 100 | 52 | 91.2 | 18 | 100 | 0.329 | |

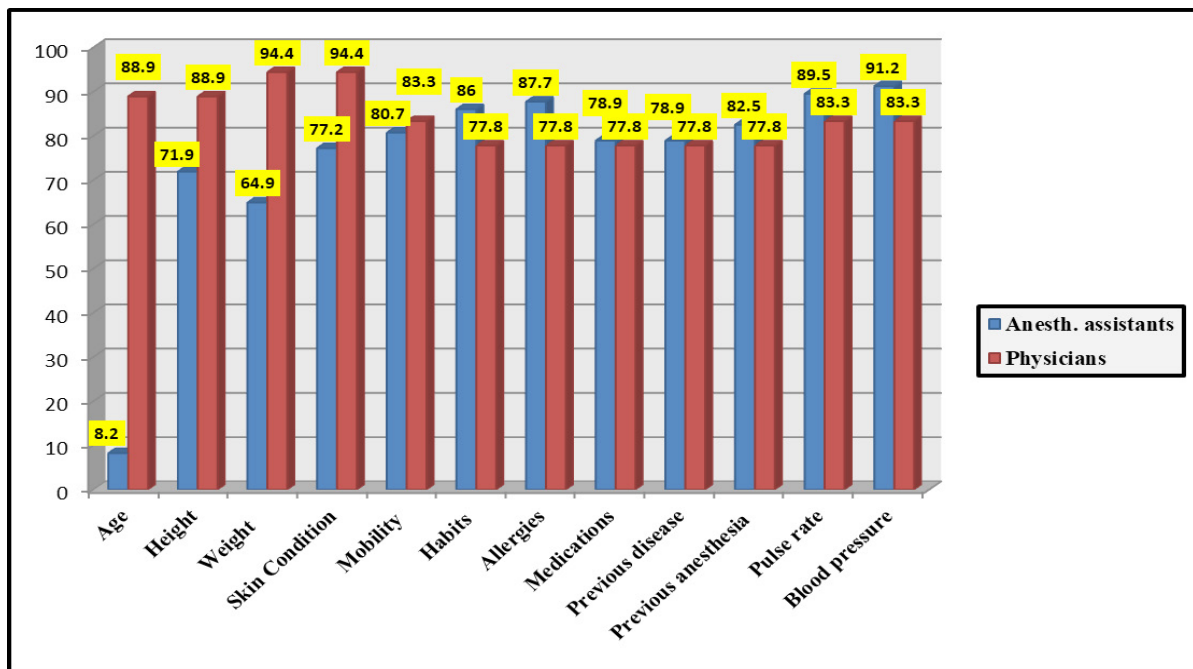


Figure 1: Anesthesia assistant's and physician's opinions regarding the anesthesiologist assistant role (the day before surgery)).

be assumed by the anesthesiologist assistant by 78.9% of the studied anesthesia assistants' and 66.7% of the studied physicians. Check the chart for the presence of investigations, informed consent, special medication, obtain anesthesia consent and instruct the patient about NOP, and stop smoking were agreed to be assumed by the anesthesiologist assistant by (87.7% and more) of total studied anesthesia assistants' and physician. Concerning removal of jewelry, hair pins, nail polish and make up, they were agreed to be assumed by the anesthesiologist assistant by most of the anesthesia assistants' and by all studied physicians except for prosthesis as report by 83.3%. The only statistical significant difference between anesthesia assistants' and physicians' opinions was

found regarding to the assessment of patient weight at $p \leq 0.05.$, as illustrated by Table 2 and Figure1.

Table 3 and Figure 2 shows Anesthesia assistants' and physicians' opinions regarding the role of anesthesiologist assistant during the induction and maintenance of anesthesia

The Table 3 and Figure 2 showed that the majority of total anesthesia assistants' and physicians' opinions (more than 72.2%) as reported these activities be to performed by the anesthesiologist assistant, as administer intravenous anesthetic agent, attach the patient to anesthesia machine , suction airway, obtain an arterial blood sample for blood gases and electrolyte analysis as needed,

Table 3: Anesthesia assistants' and physicians' opinions regarding the role of anesthesiologist assistant during the induction and maintenance of anesthesia.

| Items | RTH | | RTHMC | | RH | | SH | | Total | | | | X ² (P) | | | | | | | | |
|--|-------------------------------|----|-------------------|----|------------------------------|-----|-------------------|-----|------------------------------|-----|-------------------|-----|--------------------|------------------------------|---|-------------------|----|------------------------------|----|--------------------|------------------|
| | Anesthesia assistants (n= 23) | | Physicians (n= 5) | | Anesthesia assistants (n=11) | | Physicians (n= 5) | | Anesthesia assistants (n=12) | | Physicians (n= 4) | | | Anesthesia assistants (n=11) | | Physicians (n= 4) | | Anesthesia assistants (n=57) | | Physicians (n= 18) | |
| | No | % | No | % | No | % | No | % | No | % | No | % | | No | % | No | % | No | % | No | % |
| 1. Place the patient on 100% O2 for 5 min preanesthesia | 16 | 70 | 2 | 40 | 8 | 73 | 4 | 80 | 12 | 100 | 2 | 50 | 10 | 91 | 3 | 75 | 46 | 81 | 11 | 61 | 2.878 -0.09 |
| 2. Recheck the name, doses of the drugs on the syringe before use | 18 | 78 | 2 | 40 | 9 | 82 | 2 | 40 | 9 | 75 | 2 | 50 | 7 | 64 | 1 | 25 | 43 | 75 | 7 | 39 | 8.224* -0.004 |
| 3. Administer intravenous anesthetic agents as prescribed | 18 | 78 | 3 | 60 | 11 | 100 | 3 | 60 | 10 | 83 | 4 | 100 | 7 | 64 | 3 | 75 | 46 | 81 | 13 | 72 | 0.586 (0.004) |
| 4. Assist in the insertion of endotracheal tube | 15 | 65 | 3 | 60 | 9 | 82 | 3 | 60 | 12 | 100 | 2 | 50 | 5 | 46 | 2 | 50 | 41 | 72 | 10 | 56 | 1.686 (0.194) |
| 5. Attach the patient to anesthesia machine | 18 | 78 | 3 | 60 | 11 | 100 | 3 | 60 | 10 | 83 | 4 | 100 | 8 | 73 | 3 | 75 | 47 | 83 | 13 | 72 | 0.895 -0.344 |
| 6. Suction the airway as needed | 17 | 74 | 3 | 60 | 11 | 100 | 3 | 60 | 10 | 83 | 4 | 100 | 10 | 91 | 3 | 75 | 48 | 84 | 13 | 72 | 1.295 (0.255) |
| 7. Administer the intravenous blood or fluid as prescribed | 14 | 61 | 2 | 40 | 9 | 82 | 3 | 60 | 9 | 75 | 3 | 75 | 10 | 91 | 3 | 75 | 42 | 74 | 11 | 61 | 1.043 (0.307) |
| 8. Assist in the insertion of monitoring catheters | | | | | | | | | | | | | | | | | | | | | |
| Central venous pressure catheter | 10 | 44 | 1 | 20 | 9 | 82 | 3 | 60 | 6 | 50 | 4 | 100 | 5 | 46 | 3 | 75 | 30 | 53 | 11 | 61 | 0.397 (0.529) |
| Arterial blood gases catheter | 11 | 48 | 2 | 40 | 9 | 82 | 3 | 60 | 7 | 58 | 3 | 75 | 5 | 46 | 3 | 75 | 32 | 56 | 11 | 61 | 0.138 0.710 |
| Pulmonary artery pressure catheter | 13 | 57 | 4 | 80 | 9 | 82 | 3 | 60 | 10 | 83 | 4 | 100 | 6 | 55 | 4 | 100 | 38 | 67 | 15 | 83 | FEp= 0.24 |
| 9. Obtain an arterial blood sample for blood gases analysis as needed | 14 | 61 | 4 | 80 | 11 | 100 | 4 | 80 | 12 | 100 | 4 | 100 | 9 | 82 | 4 | 100 | 46 | 81 | 16 | 89 | FEp= 0.722 |
| 10. Obtain sample for electrolyte Analysis as needed | 17 | 74 | 4 | 80 | 11 | 100 | 4 | 80 | 12 | 100 | 3 | 75 | 11 | 100 | 3 | 75 | 51 | 90 | 14 | 78 | FEp= 0.239 |
| 11. Observe all monitoring devices, machines, catheters and tubes for presence of any leaks or disconnection's | 17 | 74 | 3 | 60 | 11 | 100 | 5 | 100 | 11 | 92 | 3 | 75 | 11 | 100 | 4 | 100 | 50 | 88 | 15 | 83 | FEp= 0.695 |

| 12. Monitor and record the following on anesthesia chart frequently | | | | | | | | | | | | | | | | | | | | | |
|---|----|----|---|----|----|-----|---|-----|----|-----|---|-----|----|-----|---|-----|----|----|----|----|------------------------------|
| Vital signs | 20 | 87 | 3 | 60 | 11 | 100 | 5 | 100 | 12 | 100 | 3 | 75 | 10 | 90 | 3 | 75 | 53 | 93 | 14 | 78 | FEp=0.088 0.353 -0.552 |
| Oxygen saturation | 17 | 74 | 3 | 60 | 11 | 100 | 4 | 80 | 9 | 75 | 3 | 75 | 8 | 73 | 3 | 75 | 45 | 79 | 13 | 72 | |
| Concentration of inhalational anesthetic agents | 15 | 65 | 3 | 60 | 11 | 100 | 4 | 80 | 9 | 75 | 3 | 75 | 6 | 55 | 2 | 50 | 41 | 72 | 12 | 67 | 0.183 (0.669) |
| Intravenous anesthetic agents or any medication given | 13 | 57 | 3 | 60 | 10 | 91 | 4 | 80 | 9 | 75 | 4 | 100 | 7 | 64 | 2 | 50 | 39 | 68 | 13 | 72 | 0.093 (0.760) |
| Blood loss | 12 | 52 | 3 | 60 | 10 | 91 | 5 | 100 | 10 | 83 | 3 | 75 | 8 | 73 | 1 | 25 | 40 | 70 | 12 | 67 | 0.079 (0.778) |
| CVP if central venous catheter attached | 14 | 61 | 2 | 40 | 11 | 100 | 3 | 60 | 12 | 100 | 3 | 75 | 10 | 91 | 3 | 75 | 47 | 83 | 11 | 61 | 3.556 (0.059) |
| Fluid or blood replacement | 15 | 65 | 2 | 40 | 10 | 91 | 4 | 80 | 12 | 100 | 3 | 75 | 9 | 82 | 3 | 75 | 46 | 81 | 12 | 67 | 1.537 (0.215) |
| Urinary output | 17 | 74 | 4 | 80 | 11 | 100 | 5 | 100 | 12 | 100 | 4 | 100 | 11 | 100 | 3 | 75 | 51 | 90 | 16 | 89 | FEp= 1.000 |
| PUPIL size | 15 | 65 | 2 | 40 | 11 | 100 | 4 | 80 | 10 | 83 | 3 | 75 | 7 | 64 | 2 | 50 | 43 | 75 | 11 | 61 | 1.393 (0.238) |
| Patient's position | 16 | 70 | 4 | 80 | 11 | 100 | 4 | 80 | 12 | 100 | 4 | 100 | 10 | 91 | 4 | 100 | 49 | 86 | 16 | 89 | FEp= 1.000 |
| Time of administration of anesthesia | 16 | 70 | 3 | 60 | 10 | 91 | 5 | 100 | 11 | 92 | 3 | 75 | 7 | 64 | 3 | 75 | 44 | 77 | 14 | 78 | FEp= 1.000 |
| 13. Report and assist in the management of any anesthesia complications | | | | | | | | | | | | | | | | | | | | | |
| | 14 | 61 | 3 | 60 | 10 | 91 | 4 | 80 | 11 | 92 | 3 | 75 | 7 | 64 | 3 | 75 | 42 | 74 | 13 | 72 | 0.015 (0.903) |

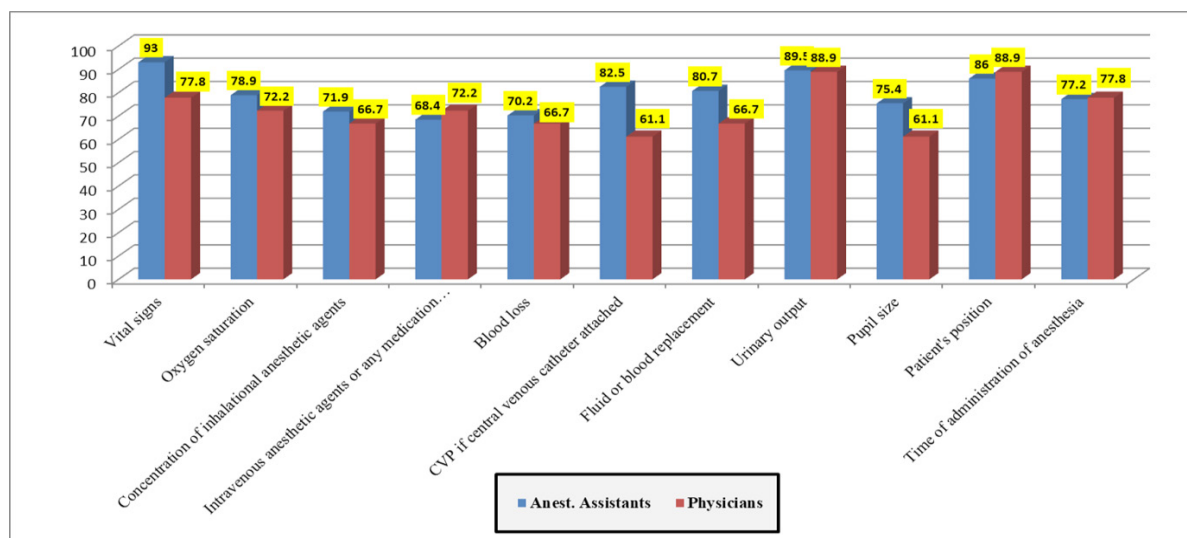


Figure 2: Monitor and record on anesthesia chart frequently.

and observe all monitoring devices, monitoring and recording: vital signs, oxygen saturation, urinary output, patient's position, recording the time of administration of anesthesia, reporting and assisting in the management of any anesthesia complication during the induction and maintenance of anesthesia to be assumed by the anesthesiologist assistant.

Regarding to assisting in the insertion of monitoring catheters (Central Venous Pressure Catheter), the results shows that 20.0% of physicians in RTH reported it to be

performed by the anesthesiologist assistant, while 40% of physicians in Ramadi Teaching Hospital agree about assisting in the insertion of Arterial blood gases to be performed by the anesthesiologist assistant.

Considering recheck the name, dose of the drug on the syringe before use, it was reported by only 38.9% of total physicians, to be performed by the anesthesiologist assistant. This table also shows a statistically significant difference between anesthesia assistants' and physicians' opinions regarding to the role of the anesthesiologist

assistant during recheck the name, and does of the drugs on the syringe before use ($p \leq 0.05$).

Table 4 and Figure 3 shows anesthesia assistants' and physicians' opinions regarding the role of anesthesiologist assistant during the emergency period (before the patient transfer from the operating room)

The results indicate that all studied physicians accepted the anesthesiologist assistant role in assisting in the extubation of the patient and check the patency of the airway (50.0%, 66.7% respectively) of total physicians.

As regards, assisting in the extubation of the patient and

applying oxygen were reporting by 40.0% of physicians in Ramadi Teaching Hospital.

Considering anesthesiologist assistant role related to check the patency of the airway, apply suctioning, observe all monitors, and record their value on anesthesia chart, arouse the patient frequently, disconnect the patient from the operating room monitors were accepted by an equal percentage of 60.0% of physician's in Ramadi Teaching Hospital as anesthesiologist assistant role in immediate postoperative phase.

Moreover, the other anesthesiologist assistant role during emergency period was accepted by almost three quartos,

Table 4: Anesthesia assistants' and physicians' opinions regarding the role of anesthesiologist assistant during the emergence period (before the patient transfer from the operating room).

| Items | RTH | | | | RTHMC | | | | RH | | | | SH | | | | Total | | | | FEp |
|---|-------------------------------|-----|-------------------|-----|------------------------------|-----|-------------------|-----|-------------------------------|-----|-------------------|-----|------------------------------|-----|-------------------|-----|------------------------------|-----|--------------------|------|---------------------------------|
| | Anesthesia assistants (n= 23) | | Physicians (n= 5) | | Anesthesia assistants (n=11) | | Physicians (n= 5) | | Anesthesia assistants (n= 12) | | Physicians (n= 4) | | Anesthesia assistants (n=11) | | Physicians (n= 4) | | Anesthesia assistants (n=57) | | Physicians (n= 18) | | |
| | No | % | No | % | No | % | No | % | No | % | No | % | No | % | No | % | No | % | No | % | |
| 1. Assist in the extubation of the patient | 13 | 57 | 2 | 40 | 10 | 91 | 3 | 60 | 10 | 83 | 2 | 50 | 10 | 90 | 2 | 50 | 43 | 75 | 9 | 50 | X ² #NAME? |
| 2. Check the patency of the airway | 18 | 78 | 3 | 60 | 10 | 91 | 4 | 80 | 10 | 83 | 2 | 50 | 8 | 73 | 3 | 75 | 46 | 81 | 12 | 66.7 | X ² =1.537p=0.215 |
| 3. Apply suctioning | 16 | 70 | 3 | 60 | 11 | 100 | 4 | 80 | 12 | 100 | 4 | 100 | 10 | 91 | 4 | 100 | 49 | 86 | 15 | 83.3 | 0.719 |
| 4. Apply oxygen | 17 | 74 | 2 | 40 | 10 | 91 | 4 | 80 | 12 | 100 | 4 | 100 | 11 | 100 | 4 | 100 | 50 | 88 | 14 | 77.8 | 0.444 |
| 5. Observe all monitors, and record its value on anesthesia chart | 16 | 70 | 3 | 60 | 10 | 91 | 4 | 80 | 11 | 92 | 3 | 75 | 11 | 100 | 4 | 100 | 48 | 84 | 14 | 77.8 | 0.499 |
| 6. Arouse the patient frequently | 17 | 74 | 3 | 60 | 11 | 100 | 5 | 100 | 12 | 100 | 4 | 100 | 11 | 100 | 4 | 100 | 51 | 90 | 16 | 88.9 | 1.000 1 |
| 7. Disconcert the patient from the operating room monitors | 16 | 70 | 3 | 60 | 11 | 100 | 4 | 80 | 12 | 100 | 4 | 100 | 7 | 64 | 3 | 75 | 46 | 81 | 14 | 77.8 | 0.747 |
| 8. Assist in transport of the patient from the operating room table to the recovery trolley | 20 | 87 | 5 | 100 | 11 | 100 | 5 | 100 | 12 | 100 | 4 | 100 | 11 | 100 | 4 | 100 | 54 | 95 | 18 | 100 | 1 |
| 9. Assist in the proper positioning of the patient on the recovery trolley | 23 | 100 | 5 | 100 | 10 | 91 | 5 | 100 | 12 | 100 | 4 | 100 | 11 | 100 | 4 | 100 | 56 | 98 | 18 | 100 | 1 |
| 10. Elevate the side rails of the trolley and apply straps as needed | 22 | 96 | 5 | 100 | 11 | 100 | 5 | 100 | 12 | 100 | 4 | 100 | 11 | 100 | 4 | 100 | 56 | 98 | 18 | 100 | 1 |
| 11. Check the IV lines, tubes, drains, catheters for absence of any leaks or disconnections | 23 | 100 | 5 | 100 | 11 | 100 | 5 | 100 | 12 | 100 | 4 | 100 | 11 | 100 | 4 | 100 | 57 | 100 | 18 | 100 | - |

| | | | | | | | | | | | | | | | | | | | | | |
|--|----|----|---|----|----|----|---|-----|----|-----|---|-----|----|-----|---|-----|----|----|----|------|-------|
| 12. Assist in the transfer of the patient from the operating room to recovery area (inside the or theater) | 21 | 91 | 4 | 80 | 9 | 82 | 5 | 100 | 12 | 100 | 4 | 100 | 11 | 100 | 4 | 100 | 53 | 93 | 17 | 94.4 | 1 |
| 13. Record the following anesthesia chart: | | | | | | | | | | | | | | | | | | | | | |
| Time of discontinuation of anesthesia | 20 | 87 | 4 | 80 | 9 | 82 | 5 | 100 | 11 | 92 | 3 | 75 | 7 | 64 | 3 | 75 | 47 | 83 | 15 | 83.3 | 1 |
| Time of transfer to recovery area | 21 | 91 | 4 | 80 | 10 | 91 | 5 | 100 | 12 | 100 | 3 | 75 | 11 | 100 | 4 | 100 | 54 | 95 | 16 | 88.9 | 0.588 |
| Name of anesthesiologists and his assistant, name of surgeon and his assistant. | 20 | 87 | 4 | 80 | 10 | 91 | 5 | 100 | 9 | 75 | 3 | 75 | 11 | 100 | 4 | 100 | 50 | 88 | 16 | 88.9 | 1 |

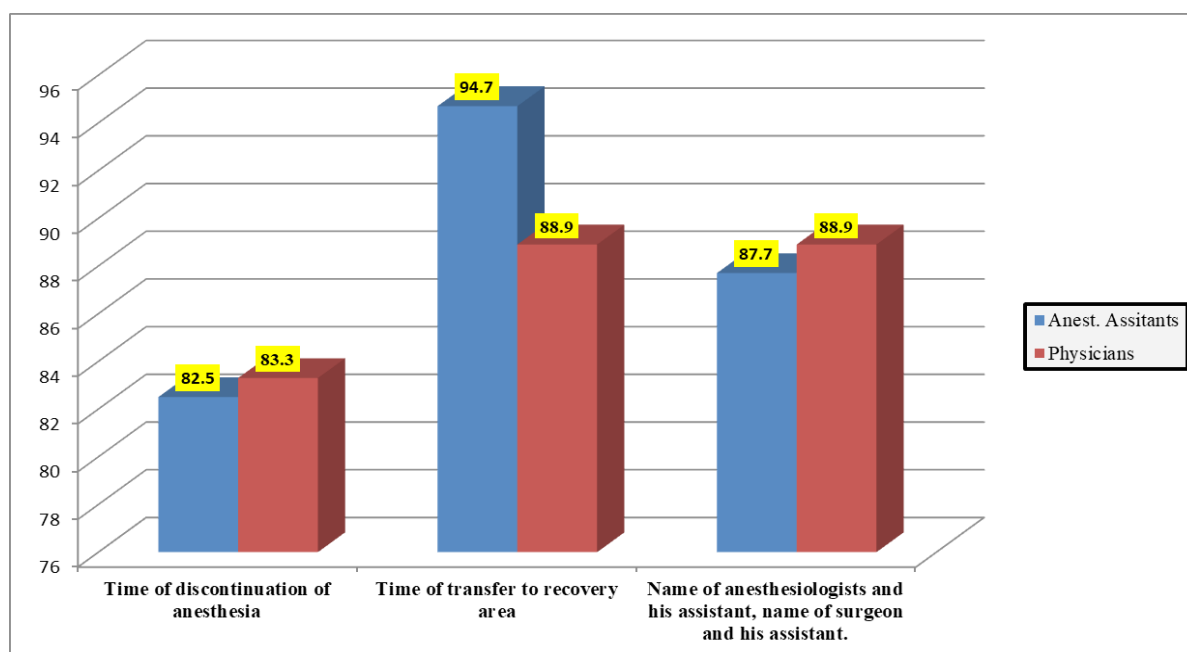


Figure 3: Anesthesia assistants' and physicians' opinions regarding the role of anesthesiologist assistant during the emergence period in recording anesthesia chart.

to be assumed by the anesthesiologist assistant of total anesthesia assistants and physicians.

A statistically significant difference between the anesthesia assistants' and physicians' opinions regarding the assisting in the extubation of the patient was found ($p \leq 0.05$).

DISCUSSION

According to the present study, most of the anesthesia assistants involved in the study from all hospitals was females, and approximately half of them were in the age group 30 to less than 40 years. However, this result was in the same line with⁸, who found that the majority of studied anesthesia assistants were females in the age 25 – 40 years, according to the results of study revealed for anesthesia assistant in in Canada, around 92% of anesthesiologist assistant are female, and in the Western

Pacific, 81% of anesthesiologist assistant were female. This may be anesthesia assistant in the age group 30- <40 years being young, they can tolerate more effort in the operating room atmosphere of work⁹.

Also, the majority of the physicians (88.9%) were males, this result was in the same line with¹⁰, and they found according to the Medscape Physician Compensation Report 2022, 61% of anesthesiologists are male, while 38% are female. This suggests that gender disparity is not unique to anesthesia and is present in many medical specialties and older male physicians may be more likely to specialize in anesthesia¹¹.

Concerning qualification of studied anesthesia assistants, the present finding revealed that more than three quarters of anesthesia assistants from all selected settings had Diploma of Technical Medical Institute of Anesthesia and a near percentage were working as operating room an

anesthesiologist assistants. In addition, only minority of them representing almost tenth had training programs about anesthesia. This means that anesthesia assistants under study at the four selected hospitals had no specific preparation about anesthesia and gained their skills and knowledge through practicing the job in the hospitals where they are working. This result is similar to that of¹². Who found that most of the qualified anesthesiologist assistant had Diploma of Technical Medical Institute of Anesthesia and were working as operating room anesthesia assistants and take responsibilities of anesthesia care¹³.

Moreover, the present study revealed that the majority of anesthesia assistants and physicians agreed about all items related to the role of anesthesiologist assistant during the preoperative phase. This finding may be due to that anesthesiologists and anesthesia assistant working with patients during preoperative, intraoperative and postoperative phases of operation were responsible to give the care during general anesthesia since at least three years, so they were knowledgeable about the responsibilities and qualifications needed to give high quality anesthesia care¹⁴. This finding was on line with¹⁵. Who identified that the preoperative phase begins with the client's decision to have surgery and ends when the client enters the operating room. During this phase the anesthesiologist or anesthesiologist assistant stay with the patient before surgery to perform complete physical examination, documenting a preanesthetic assessment, selecting and initiating the planned anesthetic technique, providing psychological support and preoperative preparation to the patient by giving data that are specifically important to intraoperative care¹⁶.

Moreover, the present study revealed that the majority of anesthesia assistants and most of physicians in all studied settings agreed about the role of anesthesiologist assistant during the induction and maintenance of general anesthesia. This finding was congruent with¹⁵, who mentioned that the anesthesiologist or anesthesiologist assistant should continually monitor body systems during induction of anesthesia and maintenance of the anesthetized state. The depth of anesthesia is monitored by observing changes in respiration, oxygen saturation and tidal volume of CO₂, heart rate, urinary output, and blood pressure. As well as the anesthesiologist assistant work with physician anesthesiologists as part of the operating team. They obtain complete patient medical histories, conduct physical exams, and pre-procedure interviews, administer required diagnostic and laboratory tests, and monitor patient progress during recovery from anesthesia procedure. They also assist in laboratory work, drawing blood and conducting tests¹⁶.

On line with the previous fining, He⁵ stated that the anesthesiologist assistant has to monitor the patient after intubation and induction of anesthesia for: Ventilation and circulation, ECG and oxygen analyzer alterations, fluid intake, calculated blood loss, behavioral changes,

diagnostic testing (collection of specimens and cultures, X- rays, and fluoroscopy), placement of medical devices (grouped, position support, drains, catheters, implants, and packing). So, anesthesiologist assistant need to have manual dexterity to help with a variety of medical procedures before and after surgery and maintain anesthesia equipment and operate it during surgery¹⁷.

Furthermore, these findings revealed that, less than half of the studied anesthesia assistants in Al Ramadi Teaching agreed about the roles in assisting in the insertion and monitoring central venous pressure catheter and arterial blood gases catheter. This finding was contradicting with¹⁸ who stated according to the Practice Guidelines for Central Venous Access, a trained anesthesiologist assistant should be used during the placement of a central venous catheter and the majority of studied anesthesia assistants agreed about the roles of anesthesiologist assistant during the induction and maintenance of general anesthesia related to assisting in the insertion and monitoring catheters (CVP, ABC)¹⁹.

Furthermore, the present study showed that the majority of all studied anesthesia assistant's and relatively high percentages of physicians agreed about the roles of anesthesiologist assistant during the emergency period including assessing extubation of the patient, checking patency of airways, applying oxygen, applying suctioning, observing all monitoring values and anesthesia chart, arousing the patient. frequently, disconnecting the patient from the operating room monitors, assisting in transport of the patient from the operating room table to the recovery trolley, assisting in the proper positioning of the patient on the recovery trolley, elevating the side rails of the trolley and applying straps as needed, checking the IV lines and tubes, assisting in the transfer of the patient from the operating room to recovery area and record it.

These findings were in agreement with¹⁵ who found that the anesthesiologist assistants work directly under the supervision of licensed anesthesiologists, in conjunction with the anesthesia care team, to create and implement anesthesia care plans and have specific roles during an emergency period include assessing extubation of the patient, checking patency of airways, applying oxygen, applying suctioning, observing all monitoring values, and anesthesia chart and managing patient airway, pulmonary status and emergence from anesthesia with ensure continuity of care and quality through demonstrate a solid understanding of safety protocols and exemplary communication skills in order to excel as part of the patient treatment team^{20,21}.

The present study also showed that less than half of studied physicians in Al Ramadi Teaching Hospital only did not accept anesthesiologist assistant role about assisting in extubation of patient and applying oxygen. This result agreed with²² who stated that the majority of anesthesiologist assistants do not agree that they have role in extubation of patient or checking the patency of the airway during the emergency period, and these activities

should be performed by anesthesiologist due to the extubation process according to²⁰, is generally include extubation failure occurs in 10 to 20% of patients and is associated with extremely poor outcomes, including high mortality rates of 25 to 50%. Other risks associated with extubation include: increased length of stay and pediatric patients present a higher risk for failed extubation if they spend more time in the intensive care unit²³.

CONCLUSION

Based on the findings of the present study, it can be concluded that, the operating room anesthesia assistants and anesthesiologists' in all hospitals agreed about the role of the anesthesiologist assistants during the preoperative, intraoperative, postoperative phases, and monitoring and recording during the process of general anesthesia.

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