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Utilization of the operating theaters in governmental hospitals in Gaza Governorates

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Utilization of the operating theaters in governmental hospitals in Gaza Governorates

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Dedication

I dedicate this work to
my parents, my wife, and my kids: Mahmoud, Lama and Amr for their great patience, help and encouragement.

Tayser M. ELSultan

Declaration

I certify that this thesis submitted for the degree of Master is the result of my own research except where otherwise acknowledged, and that this study (or any part of the same) has not been submitted for a higher degree to any other university or institution.

Signed

Name: Tayser M. ELSultan

Date: / /

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Abstract

Extensive operating room utilization is a goal of most 0perating rooms' directors and hospital administrators. Assessing the procedures and processes performed in operation rooms is the first step of evaluating the quality of care and efficiency of utilization of these rooms. This study aims to assess the current utilization of operating theaters and the time factor involved in these theaters in governmental hospitals in Gaza Governorates in order to improve the quality of current operation rooms and facilities.

A triangulated cross sectional quantitative, qualitative study was conducted in order to assess the procedures and processes implemented in these theaters. The instruments used in this study were self-constructed questionnaire, reviewing of 100 medical records for availability and completeness of these records and in depth interview for 9 mangers (doctors and nurses). All the medical staff (220) who were working in the operating theaters in three governmental hospitals were included in the study, out of them, 198 responded and completed self-constructed questionnaires, with a response rate of 90%. The researcher collected the data by himself. General measures of reliability and validity were used, Cronbach's alpha reliability test was 0.8954.

The study findings show that, most procedures which are done by doctors (surgeons and anesthesiologists) prior to surgery are done properly, but these procedures are not always done properly by the surgical department nursing staff. The study findings also show that most of needed records are available and completed in the patient's file but there is a real problem in completeness of some file records especially records related to the anesthesia and recovery sheets (80% are not completed), and also history and physical examination sheets(74% are not completed). The study results also show that there is absence of policy, standards and protocol which are essential for regulating the performance of the procedures, in addition to absence of job description which lead to role ambiguity. Moreover the number of daily working hours of the routine operating list are not appropriated with the number of operations, which it was considered the most important reason of the postponement of some cases from such list and then increasing the number of patients on the waiting list.

The researcher concluded that most of procedures are performed in a traditional way and not regulated by protocols according to standards, and the policy is an old one and not revised or reformed since a long time passed on scientific base.

The researcher recommended that the policy should be reformed, and standards and protocols should be established in order to improve the quality of health care services in operating theaters, the researcher also recommend for a further study to investigate barriers and motives for implementing procedures according to standards from healthcare providers' perspectives.

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List of abbreviations

CAB	Clinical Advisory Board
GS	Gaza Strip
HFMA	Healthcare Financial Management Association
MOF	Ministry of Financing
MOH	Ministry of Health
NGOs	Nongovernmental Organizations
NOT	Non-operative Time
OR	Operating room
ORs	Operating Rooms
PCBS	Palestinian Center Bureau of Statistics
PHC	Primary Health Care
SMC	Shifa Medical Compound
SPSS	Statistical Package for Social Sciences
TOT	Turnover Time
UNCTAD	United Nations Conference on Trade And Development
UNRWA	United Nation Relief and Works Agency
USD	United States Dollar
WHO	World Health Organization

1- Introduction

1.1 Research background

Assessing the procedures and processes performed in operation rooms (ORs) is the first step of evaluating the quality of care and efficiency of utilization of these rooms.
Although demand for surgical services may be growing, its margins are not. On the surface, it may appear that operating rooms are fully utilized and that processes are running smoothly, but when these processes are deeply examined, many of significant gaps and defects may be seen, such as defects in organizational data, lack of consistent standards in care and resource use, and ineffective of personnel and other resources due to poor scheduling and sequencing of events. All of which affect negatively the utilization of operating rooms (Healthcare Financial Management Association - HFMA, 2002).
Extensive operating room utilization is a goal of most OR. directors and hospital administrators. Unfortunately, the optimum level of utilization is not well defined, nor is it clear what tradeoffs are required to achieve optimum utilization, So it is important to identify those factors that influence optimum utilization (Donald C. and et al. 2002).
Hospitals consume the largest share of governmental health resources, mainly in developing countries in which hospitals absorb more resources than other any kind of recurrent government spending on health. Although the actual percentage varies from country to country, it is on an average 50-80% of public health sector resources in money and trained personnel are used in hospitals. Review of health sector in many countries indicates that these large expenditure on hospitals involve a great waste of resources due to the lack of technical and managerial efficiency, so there is a need to introduce professionalization in hospital management (Jan F. and et al, 2003).
The operating theatre of a hospital is considered as an area of considerable expenditure in a hospital budget and requires maximal utilization to insure optimum cost-benefit. The efficient use of operating time is also important to decrease waiting lists. So In order to improve the utilization of operating rooms it is important to know how much time is spent on each activity (Jan F. and et al, 2003).

Operating rooms have been estimated to account for more than 40% of hospital total revenues and also large portion of it is expenses, which make them a hospital's largest cost center, as well as greatest revenue source (HFMA, 2005).

Furthermore, recent studies indicate that operating room efficiency measures, such as utilization, overtime, turnover time, and on-time start performance are considered of achievable targets at most hospitals (Clinical Advisory Board-CAB, 2001).

Improving operating room efficiency is a challenging problem for several reasons: first, constructing a schedule that balances resources utilization (e.g. ORs, surgeons, anesthesiologists, nursing, etc.) is a complex issue, which includes decisions such as how many ORs. should be opened in a given day, allocation of surgery cases to operating rooms, and surgery sequencing decisions. Second, there are significant uncertainties in many of the activities involved in the delivery of care, including the duration of surgical procedures. This uncertainty leads to unexpected operating rooms utilization and overtime staffing costs due to late closure of the surgical theatre (Denton and et al. 2007).

All patients admitted to the hospital for surgery must have a current history, physical examination and preoperative laboratory data on the patient medical record prior to surgery. These data should be completed by surgeon and/ or anesthesiologist. Post-operative notes and operative summaries should be completed by surgeon and anesthesiologist. Informed consent must be completed before the operation, and this consent must take into account all special procedures. Before obtaining an informed consent, the risks. benefits, and potential complications associated with procedures should be discussed with the patient and family, if appropriate. In an emergency in which there is inadequate time to obtain an informed consent, the absence of such consent is accepted (Southwest Washington medical center.2006).

According to surgical staff observations in governmental hospitals in Gaza governorates, the patients are admitted for surgical operations either through the outpatient clinics for elective cases or through the emergency room for urgent interventions. There are many unclear procedures related to patients' admission, pre-operative, intra-operative and post-operative care. In addition the process for these procedures is unclear and not documented. Although some protocols and procedures in different areas are present, in addition to many quality projects and training programs were made by some of local medical staff in order to improve the

implementation of these procedures, but they are still not standardized and not clear for the medical staff and patients.

Possible causes that may affect the appropriate implementation of these procedures include: lack of standards, protocols, lack of resources, absence of quality indicators; and lack of monitoring and supervision. This study will asses procedures and processes of admission, pre-operative preparation, intra-operative and post-operative care in addition to recording and documentation practices. Additionally study results may contribute to the improvement and standardizing the sustainable use of these procedures.

1.2 Research problem

Despite to the efforts made by the Palestinian Ministry of Health (MOH), and local surgical staff to improve the current utilization of operation rooms in governmental hospitals, the inefficient utilization of these rooms is still a real problem. The Palestinian health care system suffers from many deficits that affect the implementation of most reforms and health improvement strategy. These include the political instability and fragmentation, and their influence on the social, economical and health aspects.

It is claimed by the local surgical staff that there are many factors that affect negatively the utilization of operation rooms in governmental hospital, such as: conflict discussion between related staff, staff frustration due to absence of clear policies, standards and protocols, which are very important for regulation of procedures performed in these rooms, and lack of coordination between the different departments, in addition to shortages of equipments, instruments and facilities. They also claimed that there is low primary hours utilization of operation rooms. All of these factors can lead to frequent cancellation of operation, long patient waiting lists, low operation rooms productivity and dissatisfaction of the patients and staff. These factors also represent a real problem which needs establishment and proper implementation of strategic plans, policies, and standards for improving the quality of care and optimum utilization of operating rooms.

1.3 Justification of the study

According to health care providers' observations, there are many procedures related to the utilization of operating rooms, such as patient admission, pre-operative preparation for surgery, intra-operative and post-operative patient care, in addition to administrative procedures, that are currently implemented in governmental hospitals, did not meet international standardization of patient care. They also claimed that there are no clear and well understood protocols and guidelines which are regulating these procedures. In addition to operating room staff dissatisfaction because of recurrent conflict between them, due to lack of standards and agreed protocols, and lack of job description for each employee. All of these defects lead to long waiting lists and shift of patients to nongovernmental hospitals. Even though, there are many efforts are done by MOH and local surgical staff, to improve the quality of care and operating rooms utilization, but there is still many challenges for improvement of these procedures. This research could represent a trial to identify factors contributing and affecting the efficiency of operating rooms utilization through supporting the implementing of appropriate procedures. The results of this study will be disseminated to the decision makers and related health providers, in order to improve the quality of care and outcomes.

1.4 Objectives

1.4.1 General objective:

To assess the current utilization of operating theaters and the time factor involved in these theaters in governmental hospitals in Gaza Governorates.

1.4.2 Specific objectives:

- To assess the current procedures and processes used in the operating theaters.
- To examine variations in utilization in relation to organizational characteristic variables.
- To identify the main factors that affect the utilization of operation rooms.

- To come out with recommendations and suggestions to improve the quality of current operation rooms and facilities.

1.5 Research questions

- Are there standardized procedures and protocols in the operating rooms?
- Are these procedures clear for the staff and effectively implemented?
- What are the factors affecting the implementation of these procedures?
- What are the required steps to improve procedures in relation to admission, preoperative, intra-operative and postoperative care in operating rooms?
- What are the main factors that can affect negatively the utilization of operating rooms?
- What are the main gaps that can lead to patient delay?
- Is there scheduling for operating rooms time and available resources?
- What are the recommendations and suggestions required to improve the quality of current operation rooms and facilities utilization?

1.6 Context of the study

1.6.1 Demographic context

The entire area of historical Palestine is about 27,000 square km, which stretches from Ras Alnakura in the north to Rafah in the south. Palestine boarded by Lebanon in the north, the Gulf of Aqaba in the south, Syria and Jordan in the east and by Egypt and Mediterranean sea in the west (Annex 1). The importance of strategic setting of Palestine is that it is cross road three continents, Asia, Africa and Europe, which making it coveted place to many of the rapists over the centuries. Palestine was places under British mandate, finished by "Israel" establishment in 1948 in implementing the unfair and wicked Balfour Declaration in 1917 to providing a homeland for Jews, and as a result most of Palestinians became refugees in West bank (WB), Gaza strip (GS), Jordan, Lebanon, Syria, and others countries. (Abu-Lughod, 1971). Currently Palestinians living in Gaza Strip and West Bank in a total area of 6,020 sq. km. which represents 22% of historical Palestine area, with a total population living in is 3,762,005 individuals in 2006 with capita per sq. km. 625 (MOH,2006).

Gaza strip is a narrow piece of land, located in the south of Palestine on the coast of Mediterranean sea (Annex 2). It has a 51 km border with occupied Palestine 1948 and an 11 km border with Egypt (Wikipedia). Gaza strip is a highly crowded area, where approximately 1,5 million live in 365 sq. km, two third of them are registered as refugees, estimated density is 4,000 people per sq. km, furthermore the population is concentrated in 7 towns, 10 villages and 8 refugee camps (PCBS, 2007). The density is increased in refugee camps, whereas "for example" over 80.000 refugees live in beach camp in an area of less than one sq. km (UNRWA, 2005). Gaza Strip is classified into five governorates: North of Gaza, Gaza city, Mid-Zone, Khan-younis and Rafah.

The population under 15 year old percentage in Gaza Strip is 49% and 2,5% of age 65 years and more (MOH, 2006). The researcher assumes that all the previous demographical circumstances and political sequences could have an effect on health care system plan and consumer behaviors.

1.6.2 Socio-economic situation

"Israeli" closure policies against Gaza Strip people among different times is having serious negative effect on Palestinian economic situation. After al-Aqsa Intifada in 2000, many of Palestinian workers have lost their work in "Israel" and sharp down turn in wage income from "Israel" (World Bank, 2003).

After Palestinian legislative election in 2006, all funds to the Palestinian government from "Israel", the United States, Canada, and the European Union have been frozen. The severity of closure increased after political unrest in June, 2007. Prosecute deteriorating economic situation on the Gaza Strip led to the rise in unemployment rate to 65%, and 85% of households are living under the poverty line (UNCTAD, 2007).

Overall bad economy has a negative effect on the size of the government revenues from taxes, which are an important source of financing for health, and increased dependence of the Government to donors, as well as the impact on the ability of patients to obtain medicine and make them more dependent on the Ministry of Health in the health services.

1.6.3 Health care system

The Palestinian's overall health is relatively good compared with neighboring countries, major outbreaks of diseases are prevented and health indicators also improved by effective health services (WHO, 2006). Life expectancy in 2005 was 72 years for male and 73 years for female, infant mortality rates were 20 per 1000 live births (MOH, 2006). The main cause of death among adults is noncommunicable diseases, in particular cardiovascular diseases. A study carried out by Johns Hopkins University (USA) and Al- Quds University (in Jerusalem) for CARE International in late 2002 revealed a bad nutritional situation among the Palestinian population. The study found that 17.5% of children aged 6–59 months suffered from chronic malnutrition. 53% of women of reproductive age and 44% of children were found to be anemic (Al Quds University and John Kopkins University, 2002). Iron deficiency anemia represents the major nutritional problem, followed by subclinical vitamin A deficiency, rickets and iodine deficiency. Furthermore, the level of chronic malnutrition among children under five years appears to be slowly increasing (WHO, 2006). The stressful life condition and "Israel" violence against Palestinians, lead to prevalence of common mental disorders, in 2003 was reported that 40.3% among the 59% of the population whom were exposed directly to violence, compared with 12.6% among the 41% of the population whom were not exposed are suffering from mental disorders (WHO, 2006).

The health care system in Palestine is complex. There are four major health providers: MOH, United Nation Relief and Works Agency (UNRWA), nongovernmental organizations (NGOs), and private profit sector (Abed, 2007).

The MOH is the main health care provider in Palestine, which provides primary, secondary and tertiary services. The UNRWA provides mainly primary health care services to the refugee population. The NGOs and private for profit sector also provide the three levels of care through a wide range of practices (WHO, 2005).

1.6.4 Health sector financing

There are four main primary sources of health care funding in Palestine: First one is from Ministry of Financing (MOF), that come from revenues of taxation, health insurance and co-payment, the seconded source is international donors and agencies including UNRWA, third source is privet for profit investment, and the last one is household expenditures (out of pocket payment) (Abed, 2007), in 2002 the health

sector was financed by MOF (15%), households (38%) (including health insurance premiums, co-payments and fees in public and private facilities), and donors (48%) (Abed, 2007; WHO, 2005).

MOH was responsible for 47% (represent nearly half of it for salaries) of total health expenditure, UNRWA (10%), NGO,s (25%), and the private for profit sector (17%), furthermore, 29% of health expenditure was directed toward PHC, while 49% toward the hospitals sector (Abed, 2007).

The Palestinian per capita health expenditure is higher than regional countries (WHO, 2005). It was 94 United States Dollar (USD) in 2002, which is lower than 1996 where it was 122 USD. The per capita health expenditure still decreased due to decrease of MOH budget and "Israeli" closure, where in 2005 the figures show that the per capita health expenditure was 41.5 USD (MOH, 2006).

In 2004 it was reported that 76% of Palestinians people were covered by health insurance, and more than 50% had governmental coverage and 30% were covered by UNRWA. The remaining percent were covered by social security or military health insurance (WHO, 2005).

In 2003 Approximately 27% of MOH budget was expensed on drugs, medical supplies and vaccine (15.5 for WB and 11.5 for GS), where 18% of this budget was used for hospital and 9% for Primary Health Care (PHC) (Abed,2007).

Revenue from health insurance is 85% and co-payment is 15%, which represented in 2005 about 29% of the total MOH budget (MOH,2006)

1.6.5 Hospitals in Gaza Governorates

There are 27 hospitals in Gaza Governorates, out of them 13 are managed by Palestinian ministry of health with a capacity of about 1500 beds. Private and non-governmental hospitals together provide another 500 beds (WHO, 2009).

There are 38 operation rooms in governmental hospitals in Gaza Governorates, distributed as the following: Shifa Medical Compound 14 theatres, European Gaza hospital 5 theatres, Nasser Medical Compound 6 theaters, Abo Yousef Al Najar 2 theaters, Tall Al sultan 2 theatres, Shohadaa Al Aqsa 3 theatres, Kamal Odwan 2 theatres, Bet Hanon 2 theatres and ophthalmology hospital 2 theatres. And according to MOH report 2008 the average number of surgical operations performed in these hospitals are distributed as the following: Shifa medical compound 8768 cases, European Gaza hospital 7753 cases, Nasser Medical Compound 5991 cases, Abo

Yousef Al Najar 927 cases, Tall Al sultan 1884 cases, Shohadaa Al Aqsa 1798 cases, Kamal Odwan 2107 cases , Bet Hanon hospital 1311 cases and ophthalmology hospital 2495 cases (Annex 3). Some of these operations like cardiovascular and neurovascular surgeries which are performed in Shifa hospital need more time than surgeries performed in other hospitals.

1.6.5.1 Shifa Medical Compound (SMC)

Shifa hospital was established in 1964 on an area over 45,000 sq.m, it is located in the west part of Gaza city, and it developed over years until recently is defined as Shifa medical compound, which considered as the biggest and main referral health institution in Gaza, that provides secondary and tertiary health care services for more than 500,000 inhabitants (Shifa Hospital records, 2008).

In 2008 SMC has a capacity of 506 inpatient beds, distributed in three hospitals (medical, surgical, and obstetric and gynecological), in addition to 94 day care beds. The average occupancy rate was 80, 9% in 2008 including the occupancy rate of day care beds. And the number of staff that working in SMC is around 1500 which is ranging between physicians, nurse, pharmacists, administrators, cleaners, messengers and security staff (Hospital records, 2008).

According to hospital records 2008, the number of admissions was 48307, distributed as the following: Surgical hospital 14970 cases, internal medicine 11848 cases and in maternity hospital 21489 cases.

There are 7 operation rooms in surgical hospital and 5 rooms in obstetric and gynecological hospital, in addition to 2 operating rooms in day care department. In SMC 8768 surgical operations were performed during the year 2008 (MOH, 2008). The surgical hospital is the main referral surgical center in Gaza with a capacity of 187 beds, for general and other surgical subspecialties. The working staff are estimated as: 137 surgeons, 25 anesthesiologists, 35 OR. technicians, 10 anesthesia technicians and 150 nurses, in addition to administrators staff (Hospital records, 2008).

1.6.5.2 European Gaza Hospital (EGH)

The EGH is located in the southern governorate of Khnyounis. It was built in 1993 and considered as one of the biggest investment in the area. The hospital services started in July 2000 and it provides secondary health services to population of

500,000 inhabitants. EGH played a very important role in health services development process through introducing new systems such as appointment system and computerized networking system (MOH, 2008).

In 2008 EGH has a capacity of 240 beds, out of them 75 surgical beds, and the number of operating rooms are 5 theatres in which 7753 operations were performed in 2008 (MOH, 2008).

According to hospital's records the number of medical staff in the surgical operation suite is 124 distributed as the following: 70 surgeons, 17 anesthesiologists, 5 anesthesia technicians, 5 OR technicians and 27 0R nurses.

1.6.5.3 Shohadaa Al-Aqsa Hospital

Shohadaa Al Aqsa hospital is located in the west part of Deer Elbalah city. It was built in 2001 and provides health services to population of about 250,000 inhabitants. This hospital has a capacity of 103 inpatient beds, out of them 28 surgical beds, in addition to 33 day care beds, and the number of operating rooms are 3 theaters wherein 1798 operations were performed in 2008 (Hospital records 2008).

According to hospital records the number of medical staff in the surgical operation suite is 44 (20 surgeons, 6 anesthesiologists, 5 anesthesia technicians, 3 OR. technicians and 10 0R. nurses).

1.7 Operational definition of terms

Operating room

Is a room within a hospital within which surgical operations are carried out. It is called also operating theatre or operating suite (McIntosh C and et al. 2006).

Recovery room

A hospital unit neighboring operating room, in which the patient recover from the immediate effect of anesthesia, and provides a setting for the detection and treatment of early postoperative complications, and also called post- anesthesia care unit. (Keith Allman, 2000).

Anesthesiologist

Is a medical doctor trained to administer anesthesia drugs and manage the medical care of patients before, during, and after surgery (McIntosh C and et al. 2006).

Operating room management

Is the science of how to run the operating room (McIntosh C and et al. 2006).

Allocated OR. time

Is an interval of OR. time with specified start and end times on a specified day of the week that is assigned by the facility to a service for scheduling cases (Dexter F. and et al. 2004).

Operative time

Time from when the patient is ready for the surgical procedure to the end of surgery (Maureen Harders and et al. 2006).

Non-Operative time

Is defined as the time spent from the end of surgical activity until that the next patient is ready for the skin preparation for surgery, which includes turnover time and represents a broader measure of time during which no operation actively takes place (Maureen H. and et al. 2006).

Turnover time

Time from exit of previous patient from OR. to entrance of the next patient into OR. which is the time needed to clean and ready on OR. for next cases. (Maureen H. and et al. 2006).

Anesthesia turnover time

Is the combination of two intervals, the time from operating-room entry until surgical preparation begins and the time from the end of the surgical procedure until operating-room exit (Maureen H. and et al. 2006).

Overutilized OR. time

Is the positive difference between the total hours of cases including turnover times performed by the service and its allocated OR. time (Strum DP. And et al. 1999).

Underutilized OR. time

is the positive difference between allocated OR. time and the total hours of cases including turnover times performed by the service (Strum DP. And et al. 1999).

Operating Room ready

Is the time when room is cleaned, and supplies and equipment necessary for beginning of next case are present (Maureen H. and et al. 2006).

Anesthesia induction

Time when the anesthesiologists begin the administration of anesthesia drug to provide the level of anesthesia required for the procedure (Maureen Harders and et al. 2006).

Operating room efficiency

Is a measure how will time and resources used for their planned purposes (Dexter F. and et al. 2007)

Operating room utilization

The sum of the time it takes to perform each surgical procedure, plus the total turnover time, divided by the time available (Donald C. Tyler and et al, 2002).

Assessment

The process of gathering, analyzing and discussing information from multiple and diverse sources in order make informed and consistent judgments (Weimer, 2000).

Procedure

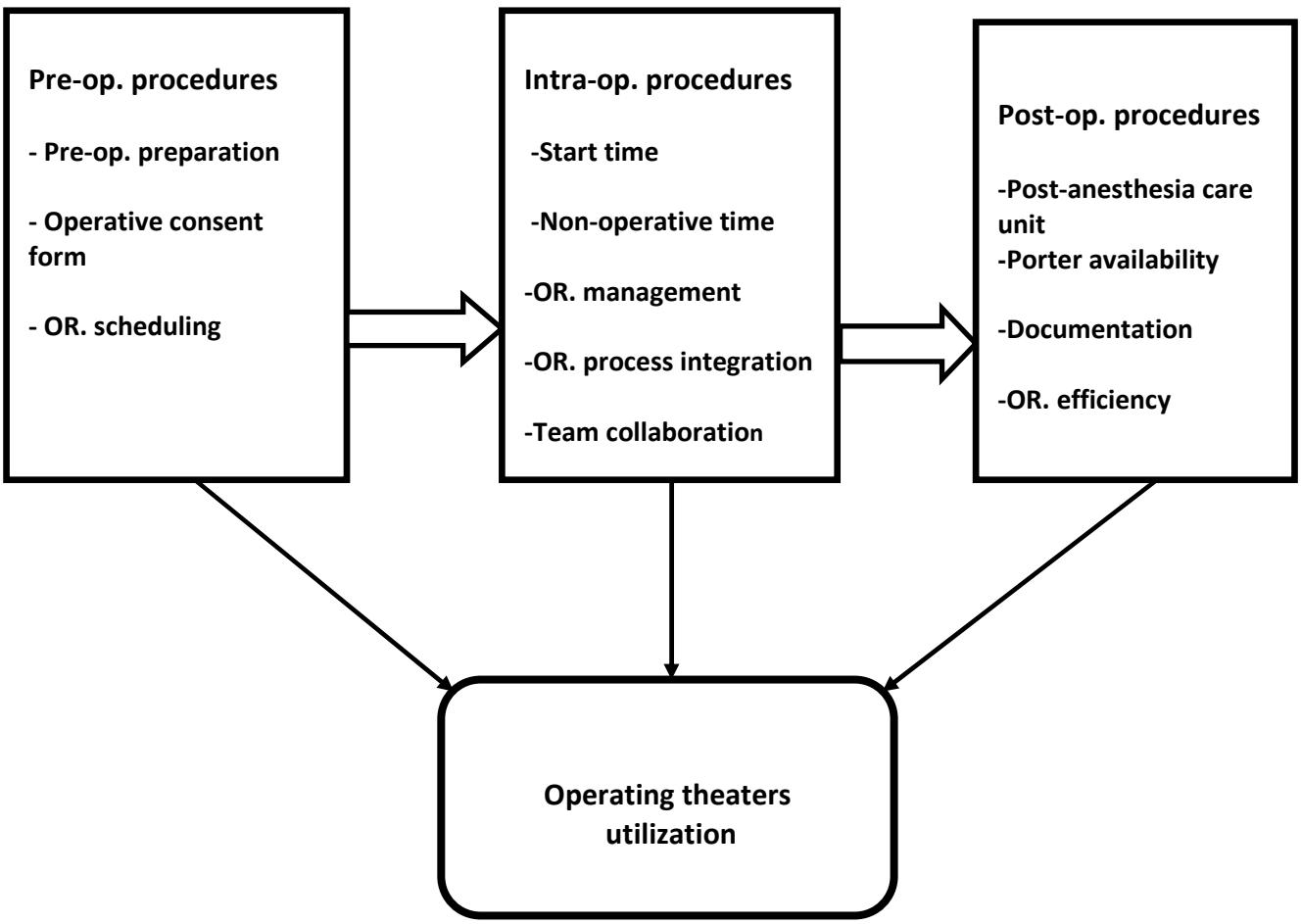
A particular method for performing a task, and usually only applies to a single role (Mike Bandor, 2004).

2- Literature review

2.1 Conceptual Framework

The conceptual framework guiding the study is shown in figure (2.1). The framework consists from three categories: Pre-operative procedures (Pre-op.), Intra-operative procedures and Post-operative procedures, that affect the utilization of operating theaters, which at the end may also affect the provision of an efficient and effective healthcare services through appropriate procedures.

Figure (2.1) Operating theaters utilization framework



Pre-operative procedures: preoperative preparation, operative consent form and operating room scheduling

Preoperative preparation is a medical assessment of patients prior the operation and plays an important role in increasing the quality of surgery, decreasing the cost of perioperative care and reducing the possibility of cancelling of unwell prepared patients (Miller Ronald,2000).

Operative consent form must be completed before the operation, and this consent must take into account all special procedures that should be performed.

Operating room scheduling is the scheduling of surgical procedures on deferent days in order to minimize and balance the number of beds required each day and so the canceling of surgical procedures could be minimized (Murray V. 2005).

Intra-operative procedures: Start time, None operative time, Operating room management, Operating room process integration, Team collaboration.

Start time is one of the most important steps that may help in reduction delays and cancellations, and improving operation room utilization (Milewski F. 2003).

Non-operative time is the time spent from the end of surgical activity until that the next patient is ready for the skin preparation for surgery, which can be used to assess the effective use of time in the ORs. Non-operative time includes turn-over time and represents a broader measure of time during which no operation actively takes place (Maureen H. and et al. 2006).

Operating room management focus on maximizing operational efficiency at the facility, i.e. to maximize the number of surgical cases that can be done on a given day while minimizing the required resources and related costs (McIntosh C. and et al. 2006).

Operating rooms process integration is achieved through exploring the requirement of this integration, defining its components, and ultimately explaining its benefits. Operating room inefficiencies can be joined directly to the lack of a hospital care delivery system that integrates the data and processes of the many functional areas that supply into the OR. (HMFA. And McKesson Corporation, 2002).

Team collaboration is especially important in the ORs. because patients are cared for by employees from several occupational groups who sometimes have to combine their special skills, time, and economic resources in extremely hectic situations.

Post-operative procedures: Post-anesthesia care unit, porter availability, documentation and operating room efficiency.

Post-anesthesia care unit: Prolonged lengths of stay in the post-anesthesia care unit is considered as an important cause of operating-room inefficiency. As well as the overcrowding in this unit is considered as a major source of compromise in operating-room productivity (McGowan JE and et al. 2007).

Porter availability: Inadequate number of porters in operating theater can lead to delaying in patients discharge from the post-anesthesia care unit and then the number of beds required for this unit use increases.

Documentation is any written or computerized generated information about the patient which describes the care or service provided to that patient. Through documentation, health providers communicate their observations, decisions, actions, and outcomes of these actions for patients (College of Registered Nurses of British Columbia, 2003).

Operating rooms efficiency is a measure of the time and resources that are used in rooms (Dexter F. and et al. 2007). Furthermore, recent studies indicate that operating room efficiency measures, such as utilization, overtime, turnover time, and on-time start performance are considered of achievable targets at most hospitals (Clinical Advisory Board-CAB, 2001).

2.2 Operating room utilization

2.2.1 Optimum operating room utilization

Extensive ORs. utilization is a goal of most OR. directors and hospital administrators. This utilization can be calculated as the sum of the time it takes to perform each surgical procedure (including patient preparation, anesthesia induction and emergence), plus the total turnover time, divided by the time available. As an example: if the average "patient in to patient out" time for herniorraphy is 45 minutes and the average turnover time is 15 minutes, then 10 herniorraphy cases can be performed in a 10 hours period in that OR, for an OR utilization of 100%. With this definition if cases extend beyond the scheduled end of the day, the time used after that schedule is counted as over- utilization, in which the hospital must pay overtime for the staff (Donald C. Tyler and et al. 2002).

Other example: If the work in OR. starts at 7:00 am and finishes at 1:00 pm, and if the regularly scheduled period of elective cases extends from 7:00 am to 3:00 pm, then there are two hours of unused OR. time, so OR. utilization equals 75% (6 hours/8 hours staffed) (Dexter F and et al, 1999).

Strum and et al (1999), defined the concepts "over-utilization and under-utilization" as: Over-utilization is the time used by scheduled cases past the end of the scheduled time. While under-utilization is defined as time during the scheduled hours of an operation that is not used. The economic efficiency of an operation room could be estimated by using those concepts.

The ability to increase OR. utilization is limited by the degree to which the schedule is allowed to extend beyond the end of the day and by the delay that patients are asked to assume. Other factor that may also affect utilization is a case duration (US. Health and Human services, 2009).

There are many causes of OR. delay which affect the operating room utilization such as: clinical complications, unavailability of instruments or supplies, unavailable laboratory results, and arrival delay among patients, anesthesiologists, surgeons; or delay in operating room preparation between procedures. The OR. delays have a negative consequences such as: negative financial impact for the hospital and the surgeons, due to fewer procedures can be performed per day. Operating room inefficiencies also lead to delays in patient care, suboptimal use of this room capacity

and as a result patient, physician and other staff dissatisfaction (US. Health and Human services, 2009).

2.2.2 Operation room primary hour utilization

It is a measure used to reflect the utilization of all available time in the operating room. The Healthcare Financial Management Association and the Clinical Advisory Board in a recent report (2001) stated that "the industry average utilization" was 68%. Most industry sources indicate that the acceptable operation room utilization should be in the range of 75-80%. The American Hospitals Association uses a guideline of 75%. Moreover, to realize utilization more than 80%, a good supporting systems are required, particularly with respect to bed availability, per admission testing, and post anesthesia care unit access (Milewski Frank, 2003).

There are a variety of hospitals that receive funding as annual global budget for providing care (e.g., those in Canada or hospitals in the United States). Once a budget has been selected for the hospital, it is administrators, have a responsibility to not exceed the selected budgeted amount. Administrators at such hospitals typically focus attention on staffed hours of operating room time because staffed OR. hours represent a large percentage of the total perioperative budget. When hospitals' administrators decide to increase or reduce the OR. budget, they have a responsibility with the OR. manager to decide which surgical groups will have their allocated OR. time increased or reduced (Blake Jon and et al, 2001).

2.3 Preoperative procedures

2.3.1 Pre-operative preparation

The goals of preoperative medical assessment of patient are: first, to reduce the morbidity of surgery, second, to increase the quality of surgery and to decrease the cost of perioperative care, and finally to return the patient to desirable functioning as quickly as possible (Miller Ronald,2000).

Traditionally these goals have been facilitated throughout preoperative meeting between the patient and the anesthesiologist, which have the following five specific purposes: First one, to obtain information about the patient's medical history, and physical and mental conditions in order to determine which tests and consultations are

needed. Second, the patient choices and the risk factors uncovered by medical history should be guided, in order to choose the care plan that should be followed. Third, to obtain informed consent. Fourth, to educate the patient about the anesthesia, preoperative care and pain treatment, in the hope of reducing anxiety and facilitating recovery. And last one to make perioperative care more efficient and less expensive (Miller Ronald,2000).

All patients admitted to the hospital for surgery must have a current history, physical examination and preoperative laboratory data on the patient medical record prior to surgery. These data should be completed by surgeon and/ or anesthesiologist.

A study at the university of Florida in Gainesville founded that pre-operative evaluations, leading to change in care plane for more than 15% of all healthy patients and for 20% of all patients in general (Miller Ronald, 2000).

Improving Preoperative processes can help in reduction of patient delay and cancelling of cases, which could be a significant source of frustration for both physician and patient. The function of preoperative process is to insure that initial assessment procedures such as radiology and laboratory testing are completed and the record is seen by the anesthesiologist before the patient's arrival to the operation room. The preoperative process includes the anesthesiologist consultation, preoperative teaching, and laboratory, radiology and electrocardiogram services, in addition to any other required consultations (Milewski Frank, 2003).

Delays and cancellation of cases in operating rooms, waste of time in these rooms and loss of hospital revenues, could be decreased when unstable medical conditions are determined before the day of surgery. Moreover it is founded that these delays and cancellations are decreasing when patients were referred to anesthesia preoperative evaluation clinic (Miller Ronald,2000).

2.3.2 Consent form

Informed consent must be completed before the operation, and this consent must take into account all special procedures. Before obtaining an informed consent, the risks. benefits, and potential complications associated with procedures should be discussed with the patient and family, if appropriate. In an emergency in which there is inadequate time to obtain an informed consent, the absence of such consent is accepted (Southwest Washington Medical Center, 2006).

2.3.3 OR. scheduling management

Optimal OR. scheduling was developed in 1970, when a hospital managers were looking for an OR. schedule that would eliminate the need to cancel surgical procedures each week because of unavailability of enough surgical beds. The Kay was to schedule surgical procedure on deferent days in order to minimize and balance the number of beds required each day and so the canceling of surgical procedures could be minimized (Murray V. Calichman, 2005).

Every hospital should develop OR. schedule that will insure smooth patient flow to, through and from these rooms. This schedule should balance the demand for surgical beds with the available hospital beds and to guarantee the maximum revenue from each of those beds (Murray V. Calichman, 2005).

Modern OR. management requires an information system that includes an efficient scheduling system, which must allocates operating rooms time and available resources, therefore scheduling is the most important issue in OR. management, which may affect the number of operations that can be performed in a given time period. The rigid and tight scheduling without flexibility may lead to disorder if unexpected events occur, in other hand too loose scheduling will result in low utilization and less efficiency, hence an ideal scheduling system can optimize the utilization of ORs. and personnel staff. Additionally the operation room scheduling rule may reflect hospital's Culture, size and philosophy (Chuug-Liang Shih and et al. 2002).

Poor scheduling is often the most important cause of lost OR. time (Dexter F. and et al. 2005)

On the practical level, allocation of resources in perioperative services occurs through the operating room schedule, so the effective OR. director should be aware on this process, whether done by hand or sophisticated computer system. Furthermore cost effective operating rooms utilization requires highly effective scheduling and optimum utilization of the resources hours with minimal overtime (Miller Ronald,2000).

Moreover unrealistic scheduling can cause delays and cost overruns, because if there is not enough time allotted in the schedule for the procedure, the cases will run at the end of the day, causing subsequent cases in the operating room, to be delayed and

possibly adding additional labor costs for staff overtime, or increasing the number of patients in the waiting list (HMFA. And McKesson Corporation, 2002).

2.4 Intra-operative procedures

The most important cost components of a surgical hospitalization are intra-operative care and when it is necessary, intensive care. As the intra-operative phase is an expensive component of in-hospital treatment, excessive intra-operative processing times can be one of the causes of case expenditures. In the intra-operative phase, the major cost factors is the duration of the intervention (the longer the operation, the greater the number of man-hours the hospital staff must work and the greater the personnel cost). (Martin Bauer and et al. 2007).

The indicators which must be measured in intra-operative phase are:

- Case length: interval from arrival of the anesthesiologist to the exit of that anesthesiologist (Martin Bauer and et al. 2007).
- Anesthesia preparation time: interval from arrival of anesthesiologist to the time when this anesthesiologist declares that patient is ready for surgery (Martin Bauer and et al. 2007).
- Perioperative time: interval from anesthesiologist declares that patient is ready for surgery to end of surgical procedure (Martin Bauer and et al. 2007).
- Surgical case length: interval from incision of the skin to the skin closure (end of last suture) (Martin Bauer and et al. 2007).
- Anesthesia follow-up time: interval from the end of surgical procedure. to the exit of anesthesiologist (Martin Bauer and et al. 2007).
- Turnover time**:** time from exit of previous patient from OR. to entrance of the next patient into OR. which is the time needed to clean and ready on OR. for next cases. (Maureen H. and et al. 2006).
- Overutilized OR. time: the positive difference between the total hours of cases including turnover times performed by the service and its allocated OR. time (Strum DP. And et al. 1999).

- Underutilized OR. time: the positive difference between allocated OR. time and the total hours of cases including turnover times performed by the service (Strum DP. And et al. 1999).

2.4.1 Start time definition

One of the most important steps that may help in reduction delays and cancellations, and improving operation room utilization is agreeing on definition of "start time". Was the start time is the time of first incision? Or was it the time of patient arrival into the operating room? (Milewski Frank, 2003).

Often nurses, anesthesiologists and surgeons define the "start time" differently; OR. nurses feel that they have properly accomplished their preparatory tasks if the room is ready at the scheduled start time, regardless of where the patient is at that time. Anesthesiologists often feel that they are "on time" if anesthesia induction has been completed by the scheduled start time. While surgeons generally believe that start time should be the time at which the skin incision is made. For maximizing scheduling accuracy and attempting to encourage the most efficient patient flow, it is optimal to define the start time as patient in the room time (Miller Ronald,2000).

An accepted definition was used by the anesthesia clinical director: D.J. Sullivan and the Governance committee "patient in the room time" is the time when the patient enters the operating room and all members of the operating team are expected to be in that room (Milewski Frank, 2003).

2.4.2 Non-operative time (NOT) and Turnover time (TOT)

There are differences on the definition of TOT. Anesthesiologists and OR. nurses usually consider TOT to be the time between cases when the room is not occupied by a patient, while surgeons consider any time when they are unable to operate as TOT (Miller Ronald,2000).

Turnover time is the time needed to clean and ready on OR. for next cases. (Room ready = time when room is cleaned, and supplies and equipment necessary for beginning of next case are present) (Maureen H. and et al. 2006).

Since turnover time occurs between operations, it can be considered a component of both the preoperative and postoperative phases (Saleh khaled and et al. 2009).

Several previous studies have focused on reducing TOT and others have addressed this problem by examining NOT which is defined as the time spent from the end of surgical activity until that the next patient is ready for the skin preparation for surgery. NOT includes TOT and represents a broader measure of time during which no operation actively takes place (NOT = room turnover time plus anesthesia induction and emergence time). There are additional opportunities to increase overall OR. efficiency by using NOT to assess the effective use of time. Reductions in NOT are best achieved by working faster, but not harder. Approaches used to gain efficiencies in NOT have included the integration of new or improving technology, modification of traditional OR. design, adding staff and finally improving work flow through the use of the parallel processing. Moreover redesigning the process that occurs between operations would lead to a decrease in non-operative time (Maureen H. and et al. 2006).

Decreasing NOT should be accompanied by a reduction in the number of delayed cases during the course of a day. Delays in the OR. often increase anxiety for patients and their families, and are a source of frustration for the OR. staff. Which in turn increase the patients and their families dissatisfaction (Maureen H. and et al. 2006).

Friedman and et al. (2006), have demonstrated that patient satisfaction remained at a high level after process redesign to improve OR. efficiency in a single OR.

Turnover time includes cleanup times and setup times, but not delays between cases. Based on data collected from 31 USA hospitals, TOT at the best performing operating rooms average is less than 25 minutes. Sometimes turnover time can be reduced by adding more staff to clean the operating room, but new problem arise as not enough time for sterilization instruments for the new case, or no enough bed in recovery room. The increase of time interval between cases which is due to surgeon unavailability should be considered delays not turnovers (Dexter F. and et al.2007).

Patient delay can be caused by resident participation and teaching activities, as well as long anesthetic induction and wakeup times, and finally when surgeons do other tasks between cases (Friedman DM. and et al. 2006).

2.4.3 Operating room management

Operating room management is the science of how to run the operating room. Operational Operating Room Management focus on maximizing operational efficiency at the facility, i.e. to maximize the number of surgical cases that can be done on a given day while minimizing the required resources and related costs, for example, what is the number of required anesthesiologists or the ORS. nurses that are needed next week to accommodate the expected workload or how the cost of drugs used in the operating room can be minimized? While Strategical Operating Room Management deals with long-term decision-making, for example, if the adding another two additional rooms to the existing facility is profitable (McIntosh C. and et al. 2006).

The primary focus of the operating room management team is to complete cases on the day of surgery, regardless of differences in healthcare systems, various methods of making OR. allocations, and alternative practices in the scheduling of elective cases. Add-on cases must be scheduled, gaps in the schedule must be filled, cases must be moved, staff must be assigned, limited resources and personnel must be prioritized, patients must be prepared and in addition, urgent cases must be sequenced (Dexter F. and et al. 2004).

The management of operating suite must take into account collaborations between the team members. The operating environment consists of interaction between surgeons, anesthesiologists, nurses, technicians, and patients. Such collaborations can mobilize all resources necessary to maximize ORs. productivity. (McIntosh C. and et al. 2006).

Moreover, the management of operating suite focus on operational decisions on the day of surgery (short term) such as moving cases from one OR. to another, assigning and relieving staff, prioritizing urgent cases, and scheduling add-on case. On the other hand, upper management typically focuses on strategic decision making (long term) such as whether to construct a new operating room, or whether to align the hospital with a regional health care system (McIntosh C. and et al. 2006).

Furthermore, The decisions which made by OR. management should have a clear and definitive purposes in order to maintain consistency such as: First, to ensure patient safety and the highest quality of care. Second, to provide surgeons with appropriate access to the OR. Third, to maximize the efficiency of operating room utilization.

Fourth, to decrease patient delays and finally to enhance satisfaction among patients, physicians and other OR. staff. Additionally if management is poor, then the medical and nursing staff may waste efforts and resources to rush cases or juggle schedules, thus compromising attention to patient safety (Dexter F. and et al. 1999).

2.4.4 OR. Management Software

OR. management software provides sophisticated and advanced access to the web for advanced surgery and viewing of surgeons work status and also their activities report. In addition it helps surgeons and other hospital's staff to print their work schedules. It is a cost effective and efficient technology that assures best utilization of operating rooms and the respective time which is available in these rooms. Furthermore this management software has many advantages, which are: First: it can guarantees best utilization of OR. and the time factor involved in these rooms. Second: it can improves the availability of personnel resources. Third: it can increase the safety of patients. Fourth: it allows smooth working of all operating rooms and finally it helps to provide complete costing for every procedure (Articlesbase, 2009).

2.4.5 Operating rooms process integration

Operating room inefficiencies can be joined directly to the lack of a hospital care delivery system that integrates the data and processes of the many functional areas that supply into the OR. System integration within the hospital is achieved through exploring the requirement of this integration, defining its components, and ultimately explaining its benefits. The hospital administration must look at the entire care-delivery process as a whole, understanding how each step, each resource, each department is interconnected and interdependent, in order to improve efficiency. The integration of resource management activities within and across the hospital allows it to gain many advantages such as: First: improving profits through better decision-making, reducing costs, and increasing the number of operations per suite per day; Second: Performance management improvements based on access to real-time, hospital data; Third: maximizing resource utilization through reduction of scheduling gaps and delays; Fourth: achieving an efficient work flow by eliminating the unnecessary processes; Fifth supplying cost reductions through standardizing product use and choices, and finally enhancing care delivery through better integration of and access to patient care data (HMFA. And McKesson Corporation, 2002).

Furthermore, improving operating room efficiency must be data-driven. A recent study identified that the shortage of comprehensive data, as well as common counting rules and standards, was considered the major barrier to proper analysis of an ORs' performance. Without understanding of where changes need to be made, the hospital's administration cannot make the reforms necessary to increase efficiencies and profits. Therefore systems integration within the ORs. helps to achieve new efficiencies and profits in three key ways: First: maximizing ORs. utilization; second: achieving an efficient work flow and finally standardizing supply selection and usage.

Moreover, an integrated scheduling system helps ORs. to improve resource utilization, increase capacity, and increase the number of operations per suite per day through: First: Real-time, integrated scheduling data which can maximize utilization of resources, people, equipment, supplies, and facilities, second: Identifying of conflicts between the surgical staff, so problems can be resolved before delays begin, and the last one is proper ordering of supplies/equipment, so what's needed is readily available (HMFA. And McKesson Corporation, 2002).

2.4.6 Team collaboration

The operating room is a demanding, stressful, and complex working environment for staff. Collaboration holds can lead to uncomplicated environmental demands without interfering with the delivery of efficient patient care (Marja Silen and et al. 2002).

In healthcare, collaboration involves high commitment and decision making in teams; it demands constant discussion, sharing of knowledge, and willingness to take responsibility (Wieczorek P. 1995).

Nursing literature indicates that collaboration is a good way of organizing the work process. The positive impact of collaboration has been increasing smoothness of work, better and quicker nursing care for patients, and a good working atmosphere for employees (Henneman E. 1995).

Collaboration is especially important in the OR. because patients are cared for by employees from several occupational groups who sometimes have to combine their special skills, time, and economic resources in extremely hectic situations. In addition, the need of collaboration is to achieve high level of patients' care, to be efficient, and to avoid unnecessary waiting time. The crucial question in ORs. collaboration is how individuals with different professions, work orientation, and

motivation can work for the organizations' goals and for the patients' best interest (Mazzei WJ. 1995).

Creating and organizing procedures every day in the ORs. requires teams. Teams are built with people and collaboration in teams has been recognized as the backbone of perioperative patient care. In addition to working together, collaboration means understanding of each other's needs, focusing on goals, sharing of resources, benefits, and mutual support. Thus, the resulting outcome of patient care is far greater than one that any individual could ever work independently. Encouraging collaboration can maintain efficiency and smoothness of work and make ORs. an enjoyable working environment. However, the stresses that ORs. team members currently experience might be one of the biggest challenges to be overcome to maintain collaboration and good patient care in ORs. (Marja Silen and et al. 2002).

It is believed that poor communication and unsatisfactory working practices between nurses and doctors may produce conflict and consequently less efficient care. Zwarenstein M. and Bryant W. (2000), founded that collaborations between nurses and doctors reduce costs and increase ORs. efficiency. It also improves staff satisfaction and their understanding of patient care. The authors concluded that increasing collaborations improve outcomes which are important to patients and to health care managers.

2.5 Post- operative procedures

The postoperative phase of operating-room processing represents a period during which a number of inefficiencies can be evident. The point of focus for these impairments of operating-room productivity is the post-anesthesia care unit. Prolonged lengths of stay in the post-anesthesia care unit are an important cause of operating-room inefficiency. As well as the overcrowding in this unit is considered as a major source of compromise in operating-room productivity (McGowan JE and et al. 2007).

Chung F. (1995), founded that most delays in the departures of patients from the post-anesthesia care unit, once they were determined to be fit for discharge, were nonmedical in nature.

The consequences of a prolonged length of stay in the post-anesthesia care unit include: delaying of timely discharge from such unit, occupation of bed space and nursing staff, and delays in surgical case scheduling (Edler AA. and et al. 2007).

As Dexter and et al. (1999), demonstrated, the faster recovery of patients from anesthesia reduces the time between the completion of surgery and the time when the patient leaves the operating room. Furthermore they also documented that the application of anesthetic techniques that require minimal post-anesthesia nursing care permits bypassing of the phase-I post-anesthesia care unit directly to the phase II step-down recovery unit, resulting in significant reductions in the average time that patients spend in the post-anesthesia care unit.

Marcon and et al. (2003), indicated that there is no clear definition of the appropriate ratio of post-anesthesia care unit beds to the number of surgical rooms in an operating suite. In order to gain clarity on the issue, they applied computer simulation in order to model operating room flow and to determine the number of beds required for appropriate function of the post-anesthesia care unit. Their simulation revealed several important findings such as: the number of porters in the operating suite has an obvious impact on the hourly utilization of post-anesthesia care unit beds, hence decreasing the number of these porters resulted in an increased in the number of beds which need to be staffed in this unit. Furthermore, porters were determined to be the potential bottlenecks in postoperative patient flow. Also they determined the most common nonmedical causes of delay in patient discharge from the post-anesthesia care unit which included: First one: absence of assigned beds for the patients. Second: preoccupation of post-anesthesia care unit nurses with other tasks. And the last one: porter unavailability. As a consequence of an inadequate number of porters, patient discharge from the post-anesthesia care unit is delayed and the number of beds required for this unit use increases. Moreover they determined that the number of porter has a larger impact on determining the number of beds necessary for function of the post-anesthesia care unit than the length of stay in that care unit. Therefore, their simulation demonstrated that porter availability is more important for operating-room managers to be considered when they are optimizing efficiency than minimizing length of stay in the post-anesthesia care unit.

Sokal and et al. (2006), demonstrated that accepting additional surgical patients generally requires additional operating rooms and working overtime under the traditional serial model of operating-room processing, but through adopting a parallel

processing model, in which anesthesia induction for next patient and operating-room setup could be accomplished simultaneously while facilitating recovery from anesthesia, the capacity in the operating room and the recovery room could be maximized without adding additional operating rooms and more staff. Additionally they noticed that the close proximity of the post-anesthesia care unit space improve the efficiency and safety of patient's transfer.

2.5.1 Documentation

Documentation is any written or computerized generated information about the patient which describes the care or service provided to that patient. Health records may be paper document or electronic document, such as computerized medical records, faxes, e-mails, audio or video tapes, and images. Through documentation, health providers communicate their observations, decisions, actions, and outcomes of these actions for patients. Moreover documentation is an accurate account of what occurred and when occurred (College of Registered Nurses of British Columbia, 2003).

London F. (2004), considered documentation as the most effective method of communication in the nursing 24 hours busy environment. While Lewis M. and Noyes J. (2005), confirmed on the importance of documenting the whole discharge planning process and to meet this goal they advised the use of discharge checklists that can be adapted for individual cases.

Furthermore Macleod A. (2006), conducted a case scenario study of a patient who was exposed to delay of discharge to describe the common causes of delayed discharge planning. He founded that many of the delays the case discharge were due to poor documentation.

2.5.2 Operation room efficiency

Operating rooms are important resources for patient and revenue, however a significant portion of OR. time is taken up by non-operative activities. (Maureen H. and et al. 2006).

They generate about 42% of a hospital's revenues, and a recent industry study shows that the average OR. runs at only 68% capacity (McKesson, 2002).

Furthermore, recent studies indicate that operating room efficiency measures, such as utilization, overtime, turnover time, and on-time start performance are considered of achievable targets at most hospitals (Clinical Advisory Board-CAB, 2001).

Operating room efficiency measures the time and resources that are used for their intended purpose. One way to examine such efficiency is to chart underutilized and overutilized time spent on a given day in an operation room. If a case takes short time than scheduled, then time underutilized, while if it takes more than planned then it produce overutilized time (Dexter F. and et al.2007).

The inefficiency of using the OR. time is measured by taking the sum of underutilized and overutilized time spent on a given day in that room: (the hours of underutilized OR. time x the cost per hour of underutilized OR. time and the hours of overutilized OR. time x the cost per hour of overutilized OR. time). OR. efficiency is maximized by minimizing the inefficiency of use of OR time, through allocating the OR. time appropriately and minimizing overutilized OR. time (The cost of overutilized OR. time includes both the direct costs of overtime and the indirect costs of possible employee dissatisfaction, resignation, and recruitment (Dexter F. and et al.2004).

Improving the process that occurs between operations would lead to decrease in non-operative time (NOT= room turnover time, anesthesia induction and emergence time). Inefficiencies in an OR. can occurs during and between cases which lead to multiple problems such as delay in delivery of patient care. They also may have a negative financial impact for the facility and may cause conflict between surgeons, anesthesiologists and other OR. staff. Such delays are associated with dissatisfaction among patients as well as health providers. Many hospitals are affected by this problem and expend their resources to find opportunities to improve efficiency. (Maureen H. and et al. 2006).

Moreover to maximize efficiency of operating rooms, the patient should be brought into these rooms as early as possible (Miller Ronald,2000).

There are several factors that can lead to ORs. inefficiency such as: First: resident participation and teaching activities often prolong case times. Second: induction of anesthesia and wakeup times may be prolonged for similar reasons. Third: Extended Turnover times due to lack of clear direction to the many trainees in the perioperative area. Fourth: Surgeons often try to fit in other tasks between cases. And finally personnel shortage such as shortage of qualified OR. nurses and technicians (Malangoni Mark, 2006).

Babineau and et al. (2004), examined the difference in operative times required for academic surgeons to perform four common surgical procedures with and without a postgraduate year-3 resident. They determined that there was in fact an increased time cost when a resident was assisting in a surgical case because of an increase in the operative time.

Work in the operating room is often done sequentially with little support to change "the system". Poor process design can create multiple bottlenecks that impede the flow of patients both into and out of the OR. suite (Malangoni Mark, 2006).

In this topic Friedman and et al, report improved OR. efficiency in a large academic medical center by the use of parallel processing. They demonstrated remarkable reductions in anesthetic induction/patient preparation and room turnover times of 61% and 45%, respectively, compared with a historical control group. This translates into a time savings of approximately 25 minutes between each case. Their study involved a single surgeon consistently doing uncomplicated inguinal, umbilical, and small ventral hernia repairs. Operating time average was less than 30 minutes per case. The OR. team was consistent, the exchange of personnel during operations was not allowed , and the role of each team member was well defined. As a result of efficiency improvements, the surgeon was able to reduce his time in the OR. without a decrease in case load, thus freeing up time for additional cases or other activities. The patients seemed satisfied, although the construction of the survey appeared somewhat biased toward satisfaction (Friedman DM. and et al. 2006).

2.6 Previous relevant studies

2.6.1 International studies

A study was carried out in the main operation suite of Sher-I-Kashmir Institute of Medical Sciences, for a period of one and half year (15-7-99 to 14-1-2001), in order to study the time utilization of operating rooms at a large teaching hospital. The study results founded that the use of theatre time could be effective: if delays in starting lists is minimized, if proper scheduling of surgical lists is done, if more detailed preparation was undertaken by the anesthesiologist, and surgical staff, if patients on long waiting lists are reassessed before admission to avoid cancellation of cases, if the induction of anesthesia is done in anesthesia room instead of operating room which would reduce the time spent on supportive services and finally by laying of sterile trolleys in lay-up room instead of operating room which would again reduce the time spent on supportive services (Jan F. and et al, 2003).

Another study was conducted at the Medical University of South Carolina, Overdyk and et al. (1998), demonstrated in this study a number of successful strategies for improving operating-room efficiency. Several of their findings addressed the preoperative phase of the operative day. Two strategies were devised by the researchers for increasing operating-room productivity which were: first one is the adoption of a standardized language of procedural times and time periods, and the second is an educational period for operating-room staff intended to provide guidelines for improving efficiency. The guidelines were devised from the findings of the pre-intervention prospective data which was collected at the period of the study. Analysis of the pre-intervention prospective data confirmed that a disproportionate number of delays were occurring during the first procedure of the operative day. The most common causes of delays in the first operation included delayed patient registration and transportation, personnel unavailability, and overcrowding in the holding area. Overdyk and et al. implemented a number of changes to address these sources of delay as the following: First, regarding to inefficient patient registration and transportation for example: the existing nursing staff were reassigned for registration and preoperative nursing functions, the anesthesiologists were allowed to transport patients to the operating room and to prepare them for anesthesia in parallel with the nursing preoperative preparation, which replaced the pre-intervention practice

of waiting until the nursing tasks were completed. No additional staff was recruited for patient preparatory functions. Second, To address the unavailability of personnel, the chief of surgery told the surgeons who were repeatedly unavailable to begin their cases on time, that they are at risk of losing their operating-room time. And finally to relieve overcrowding in the holding area prior to surgery, patients were transferred to less crowded holding areas on the basis of their admission status. And as a result they achieved a number of improvements, with regard to the patient flow in the operating room, through initiating a program for operating-room efficiency awareness and implementing specific strategies such as: The start time for the first operation of the day was advanced with an average of twenty-two minutes, turnover time was decreased for all cases combined by an average of sixteen minutes and the unavailability of surgeons, anesthesiologists, and residents was also reduced. Furthermore they estimated that their initiatives for increasing operating-room efficiency resulted in forty-six minutes of time savings in each operating room of the operative day (Overdyk and et al. 1998).

Similar approaches have been done at the University of Florida, in which work-flow assessment was completed by a team consisting of nurses, surgeons, anesthesiologists and anesthesia technicians, and the results demonstrated many instances of small inefficiencies that could be resolved by clearer job description for each employee, the development of teams, and better communication strategies. After implementing improvements, the mean turnover time decreased from 43.7 minutes to 27.7 minutes, and the mean number of patients increased from 1.78 to 2.34 per room per day. They also documented that the need for efficiency was balanced with the need to maintain or improve both patient safety and staff satisfaction (Cendan JC and et al. 2006).

Another study was conducted in St. Luke's Episcopal Hospital to improve the first-case actual start times. Windle and et al. (2001), noted that a delay in starting an operation has a multiplying and cumulative effect on the scheduled operations that follow. The orthopedic team in that hospital initiated a number of strategic changes regarding preoperative evaluation tests and processing in the preoperative holding area. The pre-intervention policy at Episcopal Hospital for preoperative evaluation was to have patients arrive for testing on the day prior to the surgery. As a part of the new strategy, surgeons were asked to instruct their patients to arrive for their preoperative testing as well as the anesthesia and nursing evaluations two weeks prior to the scheduled surgery. To improve the procedures and processes in the preoperative

holding area before surgery, nurses in the post-anesthesia care unit were scheduled to arrive at 6:00 A.M. on the day of surgery in the preoperative area to assist with preparations for the first patient. These changes allowed the patients to be transported earlier to the operating room for the anesthesia staff to begin induction. By adopting these changes, the orthopedic service enjoyed several gains in efficiency. The new two-week preadmission strategy resulted in an increase from 40% to 90% of all patients being pre-admitted. Overall delays in orthopedic operations decreased from a rate of 7.8% to 3.9%. The proportion of total orthopedic operations starting on time increased to between 80% and 87%, and there was a 26% improvement in actual start times for the first patient (Windle PE and et al. 2001).

Similar study was conducted to examine the effect of reducing anesthesia turnover time on operating-room productivity. "Anesthesia turnover time is the combination of two intervals, the time from operating-room entry until surgical preparation begins and the time from the end of the surgical procedure until operating-room exit". The study results found that increasing anesthesia staff by one physician and one nurse for induction of a surgical patient prior to the ending of the case of a previous patient significantly decreases anesthesia turnover time. By overlapping the anesthesia induction of the next patient with the case of the previous patient, the results showed a decreased mean anesthesia turnover time between patients from sixty-five minutes to fifty-two minutes, and a increased in patient occupancy time in the operating room from four hours and twenty-eight minutes per day to five hours and twenty-seven minutes (Sokolovic E. and et al. 2002).

Krieg and et al. (2007), investigated adding a completely separated induction area without adding personnel and determined that the mean anesthesia turnover time was reduced from twenty minutes to fourteen minutes without any increase in critical events.

Similar study was carried out by Torkki and et al. (2005), to determine the effects of parallel induction of anesthesia in an induction room on the entire operative day for urgent orthopedics cases, on operating-room productivity times, and on the number of completed cases performed between the hours of 7:45 A.M. and 3:00 P.M.. They found that the use of an separated induction room decreased non-operative time by 45.6%. Furthermore, there was a reduction in the delays between phases of the operative day. An additional procedure was able to be added to the operating-room schedule between 7:45 A.M. and 3:00 P.M. Monthly overtime hours of the operating room decreased

from 196 hours to 190 hours, and analysis of labor cost-efficiency demonstrated a 16% improvement.

Another study was conducted in MetroHealth Medical Center by Maureen Harders and et al. (2006), "Improving operating room efficiency through process redesign". They demonstrated in their study that a coordinated multidisciplinary process redesign, emphasizing the use of parallel process improvements can significantly reduce non- operative time which should be less than 35 minutes according to their study results. During non- operative time, a series of tasks is performed. Some but not all of these tasks must be performed sequentially. They planned the new process to optimize the number of these tasks that could be performed in parallel. Examples of this new process redesign included:

Tasks that should be done out of the operating room: First: Patient should be placed on mobile table top in the preoperative waiting room which eliminates the need to physically transfer a patient to and from the OR. table. Second: Preoperative nurse interview can obviates the need for circulating nurse interview. Third: Monitoring leads should be placed on patient in the preoperative waiting room before transport into the OR. and the same leads must be maintained until the patient's discharge from the OR. suite, and fourth: Patient should be taken to the post anesthesia care unit on mobile table top.

Parallel processing such as: First: Anesthesia interviews for next patient, beginning intravenous lines, and initiating medications should be done outside the operating room, during the proceeding case, when it is possible. Second: Environmental services personnel (cleaners), must begins room cleanup as dressing is placed. Third Anesthesiologists must divide their duties: one takes the current patient to the post anesthesia care unit, while the other prepares the room for next patient, and fourth: Circulating and scrub nurses must open instruments and prepare the operating room during cleanup.

Minimization of nonclinical disruptions such as: The first: Information collection, instructions and operative consent form should be provided in the surgeon's office, as unavailability of such consent form had been a major cause for delay in starting cases. Second: All patient information should be available in the hospital information system, and the last one: Pre-operative clinical evaluation became obligatory rather than optional, therefore the patient should be examined by the anesthesiologist before

his arrival to the operation room. This lead to decrease cancellations on the day of operation and help in minimizing a number of nonclinical disruptions.

Furthermore they also demonstrated that Facility-based interventions such as the use Of induction rooms, which allows anesthetics to be administered before arrival in the OR. suit, have been used by others to reduce NOT. Some hospitals also have used these rooms to perform regional or local anesthesia outside of the OR. Such rooms need to be in close proximity to the ORs. that they serve, which adds additional space and costs to OR. suite construction. The use of induction rooms has also been associated with the need to hire extra anesthesia and nursing personnel to optimize the effectiveness of their use. The need for additional construction and personnel has been a major limitation to their adoption in many hospitals.

Moreover their study results revealed the reasons of delay when non-operative time exceeded 35 minutes as the following: Clinical (difficult IV, difficult intubation, change in patient condition) "16%", unavailability of instruments or supplies "10%", absence of operative consent form "8%", unavailability of Laboratory result "8%", delay of patient arrival to the OR. "8%", poor commitment to the standardized process "8%", inappropriate technology-related "7%", environmental service delay "6%", anesthesiologist delayed "6%", Surgeon delayed "6%" and other factors "17%".

Another study was conducted by Weinbroum Avi A. and et al. (2002), to examine the efficiency of operating theatre in Tel-Aviv Sourasky Medical Center. The study results revealed that the waste time in the operating theatre which is defined as the time wherein the scheduled OR. was not busy with the scheduled patient amounted to 79 hours over 30 days of study period (15% of total time), was due to: inappropriately prepared patients (12%), unavailability of surgeons (7%), insufficient nursing staff, anesthesiologists, or OR. assignment to emergency surgery (59%), overcrowding of the post-anesthesia care unit (10%), and delay in transport of patients to the OR. (2%). Another causes were the frequent occurrence of surgical cases running longer than their scheduled time (termed spill-over), outrunning the staffing expectations after 3:00 PM and delaying admission of add-on and emergency procedures, adding 33% to the time wasted. A quality-assurance committee review resulted in implementation of new guidelines, and within 3 months several underlying causes were resolved, and time-waste and spill-over time was reduced by 35%. Surgical time predictions were also improved. Shortage of nurses and anesthesiologists, and OR. emergency reassignment remained the major causes of OR. waste time. They concluded that

Continuous surveillance on OR. theatre-patients' prompt care, repeated evaluation, and wise staff deployment could maximize OR. efficiency.

2.6.2 Local relevant studies

Elron M. (2009), conducted a study at Shifa Hospital, to asses the procedures in surgical departments at Shifa Hospital- Gaza Strip. The results of the study revealed several findings such as : First: absence of standards, protocols, guidelines and policies which are used to regulate the procedures and process in operating rooms and surgical departments. In addition to absence of clear written rules and regulations which are very important in regulating the work process in the hospital in general and in operating rooms in specific. Second: the quality improvement indicators in surgical departments are not satisfactory specially with the high percent of readmission and low satisfaction among discharged patients. Third: With regard to the availability and completeness of records in patients files the study revealed that most of needed records are available in the file but the serious problem is present in the completion of these records especially filing of pre-operative history taking and physical assessment of the patient, pre-operative anesthesiologist evaluations and also intra operative there was a clear defect in the completeness of operative notes which is written shortly without details and sometimes without general data, the anesthesia and recovery sheets which are essential for patients follow up and for medico legal aspect were absent in approximately 80% of patients files. Regarding the post-operative procedures there was problem in the completeness of post operative documentations filled by doctors and nurses. Fourth: Regarding discharge sheets there was a defect especially in the recommendations and instructions for the discharged patients. And finally: there was many barriers that considered a hinder for the completion of the records included: workload barriers, shortage of nurses staff , lack of incentives and promotions , shortage of materials, absence of rewards and punishment system , lack of professional knowledge about the importance of filing these records, absence of computerized recording system, ineffective in service continuous training programs and refreshment workshops, and lack of auditing monitoring and recording.

Another study was conducted by Skaik S. and et al. (2008), in Shifa Hospital to assess the current utilization of operating rooms in Shifa Hospital- Gaza Strip. The results of study identified a real problem in the procedures performed in the operating rooms

which are related to: patients, surgical staff, physical setting, equipments and surgical instruments, documentation and operation rooms' management.

Regarding to the patients: there is a serious problem in preoperative preparation of the patients, which is remarkable in preoperative nursing preparation and anesthesiologists chick up for physical fitness, that can lead to cancellation of unwell prepared patients. In addition to the defect in the availability and completion of patient's medical records, specially anesthesia sheet, recovery sheet, operative notes and unavailability of requested investigations. Moreover there is recurrent malfunctions in the elevator which lead to difficulties in the patients transferring.

Regarding to surgical staff: the problem lies in the unavailability of surgical team in the appropriate time which can lead to postponement of some cases from the operating list. In addition to occurrence of recurrent conflicts between the staff due to the lack of clear job description for each employee. Furthermore there is no medical secretary in the operating theatre.

Regarding to physical setting: there is shortage in the number of operating rooms as the number of these rooms is not appropriate with the workload, and there is no waiting area for patients prior the operation in the operating theatre.

Regarding to documentation: Absence of appropriate documentation system and computerized recording system.

Regarding to equipments and surgical instruments: there is shortage in the surgical instruments and the quality of these instruments are not correspond with the required specifications. In addition to shortage and poor quality of anesthesia machines and patient monitors. Moreover there is no periodical maintenance of these equipments.

Regarding to operation rooms' management: absence of written policies, protocols and guidelines that regulate the work in the ORs. In addition to absence of monitoring and evaluation system and absence of on the job training. Furthermore there is role ambiguity due to lack of clear job description for employees.

3- Methodology

3.1 Introduction

This chapter describes the methodology that was used in this research. The adopted methodology to accomplish this study uses the following techniques: the information about the study design, study population and ethical considerations. Also it presents the instruments which were used in this study, piloting, data collection process and data analysis. And finally, it presents selection criteria, content validity and limitation of the study.

The research was conducted through the following phases:

The first phase of the research included thesis proposal which included: identifying and defining the research problems, and establishment the objectives of the study and development research plan.

The second phase of the research included a summary of the comprehensive literature review. Literatures on claim management was reviewed.

The third phase of the research included a field survey which was conducted to assess the current utilization of operating theaters and the time factor involved in these theaters in governmental hospitals in Gaza Governorates**.**

The fourth phase of the research focused on the modification of the questionnaire design, through distributing the questionnaire to pilot study, The purpose of the pilot study was to test and prove that the questionnaire questions are clear to be answered in a way that help to achieve the target of the study. The questionnaire was modified based on the results of the pilot study.

The fifth phase of the research focused on distributing questionnaires. These questionnaires were used to collect the required data in order to achieve the research objective.

The sixth phase of the research was data analysis and discussion. Statistical Package for the Social Sciences, (SPSS), version 13 was used to perform the required analysis.

The final phase includes the conclusions and recommendations.

A two hundred and twenty questionnaires were distributed to the research population and one hundred and ninety eight questionnaires are received.

Figure (3.1) show the methodology flowchart, which leads to achieve the research objective.

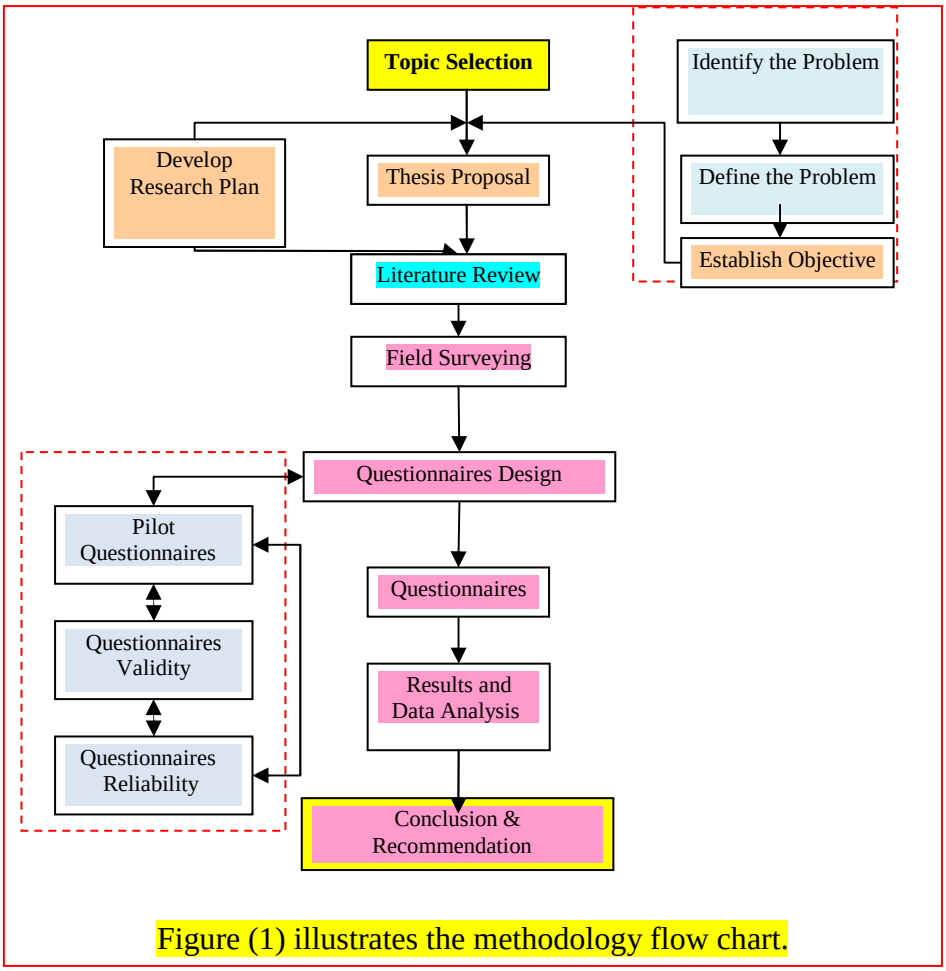


Figure (1) illustrates the methodology flow chart.

3.2 Study design

The design of this study is triangulated quantitative, qualitative design, focuses on the utilization of the operation rooms in governmental hospital in Gaza Governorates. This design is chosen because it is the best design to describe the current situation of operation rooms in governmental hospitals in Gaza Governorates. It is less expensive and enables the researcher to meet the study objective in a short time.

3.3 Study population

Study population consisted of all medical staff working in operating theaters in governmental hospitals in Gaza governorates, including surgeons, anesthesiologists, anesthesia technicians and nurses, with total number of 528 participants which are distributed over nine hospitals. The study population also included nine operating rooms' managers in addition to one hundred medical records.

3.4 Sample size

All medical operating theaters' staff which are working in three governmental hospitals with total number of 220 participants were chosen in this study and distributed as the following: 110 participants from Shifa Hospital, 66 participants from European Gaza Hospital and 44 participants from Shohadaa Al Aqsa Hospital. In addition to 9 operating rooms' managers "three from each hospital" and 100 medical records (50 from Shifa Hospital, 30 from European Gaza Hospital and 20 from Shohadaa Al Aqsa Hospital). Response rate in general was 90% (92.7% in Shifa Hospital, 92.4% in European Gaza Hospital and 79.5% in Shohadaa Al Aqsa Hospital).

3.4 Study setting

The study was conducted at three governmental hospitals in Gaza governorates. One hospital selected from each different geographical area (Shifa Hospital from north and Gaza city, Shohadaa Al Aqsa Hospital from Mid-Zone, and European Gaza Hospital from Khaneonous and Rafah), to reflect geographical representative results.

3.5 Selection criteria

3.5.1 Inclusion Criteria

All officially medical staff who are currently working in operation rooms of Shifa Hospital, European Gaza Hospital and Shohadaa Al Aqsa Hospital were included in this study.

3.5.2 Exclusion Criteria

Medical staff who are not currently working in operation rooms of the above mentioned hospitals during the data collection period for any reason (e.g., retirement, traveling, etc.) and volunteers were excluded from this study.

3.6 Ethical and administrative considerations

The researcher was keenly committed to all ethical considerations required to conduct the research. First, ethical approval obtained from both school of public health Al-Quds University (Annex 6) and Helsinki Committee (Annex 4) to carry out the study. Second, an approval letter was sent to the general director of Human Resources Development see (Annex 5), third every participant was provided with a full explanatory form attached to questionnaire. This form included the purpose of the study, assurance about the confidentiality of the information, and finally it included a statement indicating that the participant has the right to refuse or participate in this study.

3.7 Study instrument

In this research the researcher used triangulated approach: first, structured questionnaire with medical staff of operation rooms (Annex 10), second, In-depth interview with operating rooms managers (Annex 9) and finally Reviewing of files and records (presence of standard procedures and protocols) Annex(8).

3.8 Data Collection Methodology

The needed data for this research was collected by using the following instruments: First, distributing self-constructed structured questionnaire that was prepared and designed by the researcher to get information about the utilization of operating theaters and the time factor involved in these theaters in governmental hospitals in Gaza Governorates. Participants were asked to fill the questionnaire forms which were distributed to them during their working hours. Second, Reviewing of files for availability and completion of records (presence of standard procedures and protocols). The researcher himself conducted the observations. and finally the researcher has conducted in depth interview with 9 managers in operating theaters (3 surgeons, 3 anesthesiologists and 3 nurses). Research methodology depend on the analysis of data on the use of descriptive and analytic analysis, which depends on the poll and use the main program (SPSS- 13).

3.9 Questionnaire content

The questionnaire was provided with a covering letter explaining the purpose of the study, the way of responding, the aim of the research and the security of the information in order to encourage a high response. The questionnaire included multiple choice question: which used widely in the questionnaire, The variety in these questions aims first to meet the research objectives, and to collect all the necessary data that can support the discussion, results and recommendations in the research.

The sections in the questionnaire will verify the objectives of this research related to assess the current utilization of operating theaters and the time factor involved in these theaters in governmental hospitals in Gaza Governorates as the following:

Part 1 : **Personal data** consist from 7 questions.

Part 2 : **Pre-operative procedures** consist from 13 questions**.**

Part 3 : **intra-operative procedures** consist from 32 questions.

Part 4 : **Post- operative procedures** consist from 6 questions.

Part 5 : **administrative procedures** consist from 18 questions

3.10 Pilot Study

A pilot study for the questionnaire was conducted with 10 participants in Shifa hospital before data collection. It provides a trial run for the questionnaire, which involves testing the wordings of question, identifying ambiguous questions, testing the techniques that used to collect data, and measuring the effectiveness of standard invitation to respondents .

3.11 Data management and statistical analysis

3.11.1 Data entry

Data entry was done through the following steps: First, the data entry was done after over viewing of the questionnaires and the records review checklist; second, designing a data entry model using (SPSS) version 13; third, the coded variables entered into the computer by the researcher; fourth, data cleaning is done through checking out a number of the questionnaires and through exploring descriptive statistics frequencies for all variables; and finally all suspected or missed values were checked by revising the available questionnaire.

3.11.2 Data analysis

Data analysis was done by the researcher with support from a statistician. In data analysis, many different statistical tests were used, through frequency of the study factors, description of the study population. Frequency Tabulation, Bar Chart and Pie Chart were used to disseminate the study factors. Then that was followed by testing reliability of the items of the questionnaires by using Cronbach's Alpha Test and measuring validity of the instrument by using spearman correlation coefficients. After that, advanced statistical analyses was used to explore the potential relationships between the study variables, including: Friedman Test to compare between more than two dependent samples and Kruskal-Wallis Test to compare between more than two independent samples. While the qualitative data comprising a small part of the total

data was transcribed, categorized, organized thematically, observed for trends, and quantified where it needed. Statistical level of significance used was 0.05.

3.12 Validity of the Research

The validity of an instrument can be defined as a determination of the extent to which the instrument actually reflects the abstract construct being examined. "Validity refers to the degree to which an instrument measures what it is supposed to be measuring". High validity is the absence of systematic errors in the measuring instrument. When an instrument is valid; it truly reflects the concept it is supposed to measure. Achieving good validity required the care in the research design and sample selection

Face validity

The questionnaire was organized in a way that encourages the respondent to fill it. The layout and the organization of the questionnaire were highly professional and appealing.

Content validity

The questionnaire as well as the Records reviewing checklist was discussed with an experts committee to assess the relevance, clarity and comprehensiveness of the used instruments. In order to evaluate the questionnaire and the Records reviewing checklist used in this study, the researcher sent them to 10 different experts including researchers, operating rooms managers (physicians and nurses) and statisticians. The experts agreed that the questionnaire was valid and suitable enough to measure the purpose that the questionnaire designed for. And all comments of the experts were taken into consideration and some modifications were introduced according to their consultations. List of expert names are provided in Annex (12).

.

Statistical Validity of the Questionnaire

To insure the validity of the questionnaire, two statistical tests were applied. The first test is Criterion-related validity test (spearman test) which measure the correlation coefficient between each item in the field and the whole field. The second test is structure validity test (spearman test) that used to test the validity of the questionnaire structure by testing the validity of each field and the validity of the whole questionnaire. It measures the correlation coefficient between one filed and all the fields of the questionnaire that have the same level of similar scale.

3.13 Reliability of the Research

Reliability of an instrument is the degree of consistency with which it measures the attribute it is supposed to be measuring . The test is repeated to the same sample of people on two occasions and then compares the scores obtained by computing a reliability coefficient. For the most purposes reliability coefficient above 0.7 are considered satisfactory. Period of two weeks to a month is recommended between two tests due to complicated conditions that the contractors is facing at the time being, it was too difficult to ask them to responds to our questionnaire twice within short period. The statistician's explained that, overcoming the distribution of the questionnaire twice to measure the reliability can be achieved by using Cronbach's Alpha coefficient and Half Split Method through the SPSS software.

Half Split Method

This method depends on finding Pearson correlation coefficient between the means of odd rank questions and even rank questions of each field of the questionnaire. Then, correcting the Pearson correlation coefficients can be done by using Spearman Brown correlation coefficient of correction. The corrected correlation coefficient (consistency coefficient) is computed according to the following equation :

Consistency coefficient = $2r/(r+1)$, where r is the Pearson correlation coefficient. The normal range of corrected correlation coefficient $2r/(r+1)$ is between 0.0 and + 1.0. As shown in Table (3.1), all the corrected correlation coefficients values are between

0.5205 and 0.8512 and the general reliability for all items equal 0.8658, and the significant (α) is less than 0.05 so all the corrected correlation coefficients are significance at α = 0.05. It can be said that according to the Half Split method, the dispute causes group are reliable.

Table (3.1) Split-Half Coefficient method

Part	person-correlation	Spearman-Brown Coefficient	Sig. (2-(Tailed
Pre-operative procedures	0.6957	0.8205	0.000
Intra-operative procedures	0.7264	0.8415	0.000
Post- operative procedures	0.7562	0.8612	0.000
administrative procedures	0.7436	0.8530	0.000
Total	0.7634	0.8658	0.000

Cronbach's Coefficient Alpha

This method is used to measure the reliability of the questionnaire between each field and the mean of the whole fields of the questionnaire. The normal range of Cronbach's coefficient alpha value between 0.0 and + 1.0, and the higher values reflects a higher degree of internal consistency. As shown in Table (3.2) the Cronbach's coefficient alpha was calculated for the first field of the causes of claims, the second field of common procedures and the third field of the Particular claims. The results were in the range from 0.8453 and 0.8957, and the general reliability for all items equal 0.8954. This range is considered high; the result ensures the reliability of the questionnaire.

Table (3.2)| Reliability Cronbach's Alpha

section	No. of Items	Cronbach's Alpha
Pre-operative procedures	13	0.8453
Intra-operative procedures	32	0.8616
Post- operative procedures	6	0.8957
administrative procedures	11	0.8647
Total	**62**	0.8954

3.14 Limitations of the Study

- Recurrent shortage of electricity.
- Time factor.
- Political situation may affect the results of the study.
- Limited scientific resources like books and journals.
- Absence of computerized information system in operation rooms, which lead to increase period of data extraction.

4-Results and Discussion

This chapter presents the main findings of the study using descriptive and inferential analysis. The descriptive statistics used to represent the socio demographic characteristics and variations among participants and presented by tables, graphs and figures. In addition to analyze availability and completion of records . And finally presents the findings of the in depth interview**.**

4.1 Results from the questionnaire and in depth interview

4.1.1 Descriptive analysis

4.1.1.1 descriptive demographic data of the participants

Table (4.1) descriptive demographic data of the participants

S n.	Item	Frequency	Percentage
1.	**Age in Years**		
	Less than 30 years	42	21.2
	30-40 years	113	57.1
	More than 40 years	43	21.7
	Total	198	100.0
2.	**Sex**		
	Male	165	83.3
	Female	33	16.7
	Total	198	100.0
	Hospital name		
3.	Shifa hospital	102	51.5
	European Gaza hospital	61	30.8
	Shohadaa Al-Aqsa hospital	35	17.7
	Total	198	100.0

4.	**Qualification**		
	PhD	26	13.1
	Master	57	28.8
	Bachelor Degree	80	40.4
	Diploma	35	17.7
	Total	198	100.0
5.	**Experience**		
	Less than 5 years	47	23.7
	5-10 years	100	50.5
	More than 10 years	51	25.8
	Total	198	100.0
6.	**Post**		
	Surgeon	108	54.5
	Anesthesiologist	34	17.2
	Nurse	46	23.2
	Anesthesia technician	10	5.1
	Total	198	100.0

As illustrated in table (4.1), the majority of sample ages are between 30 and 40 years which represent 57.1% from the sample.

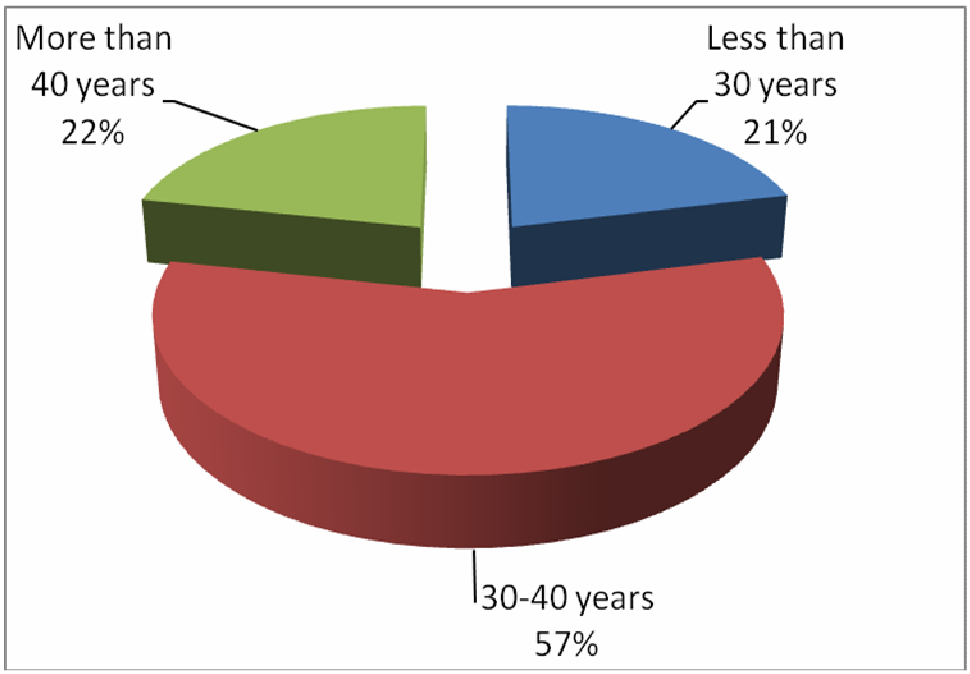


Figure (4.1) distribution of participants according to their age

This table show that the majority of the sample are male which represent 83.3% from the sample.

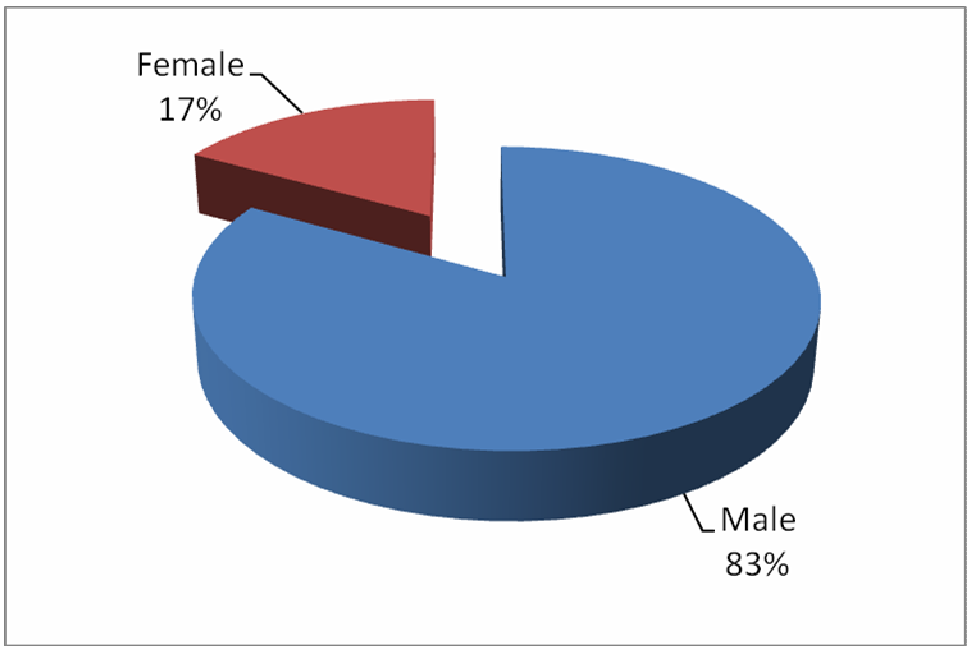


Figure (4. 2) distribution of participants according to gender

The table illustrate also that 51.5% from the sample are from "Shifa hospital", 30.8% from the sample are from " European Gaza Hospital ", and 17.7% from the sample are from " Shohadaa Al-Aqsa hospital.

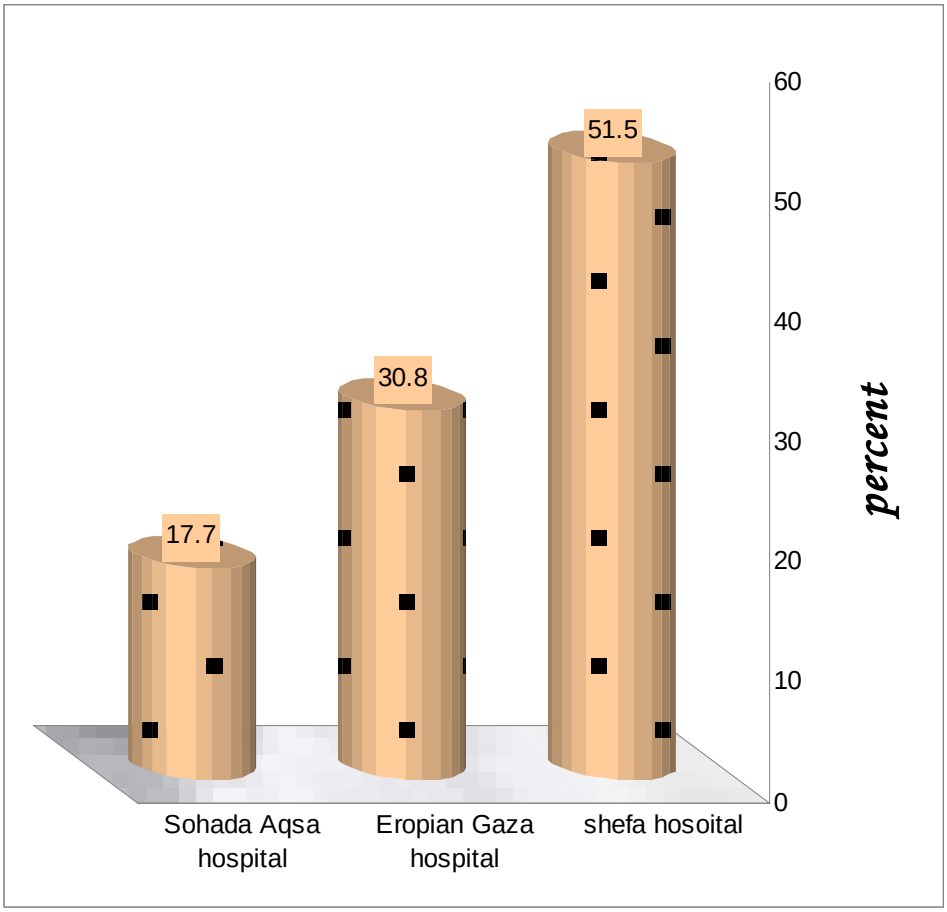


Figure (4. 3) distribution of participants according to type of hospital

This table show also that the majority of the sample there's qualification are "Bachelor Degree", which represent 40.4% from the sample.

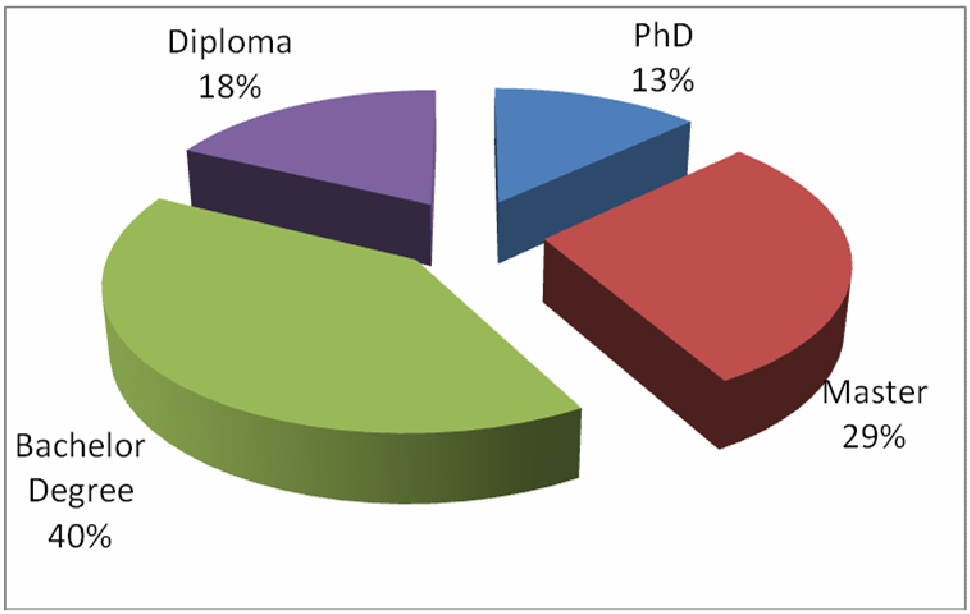


Figure (4.4) distribution of participants according to their qualification

Furthermore it is illustrated that the majority of the sample there's experiences "5-10 years ", which represent 50.5% from the sample.

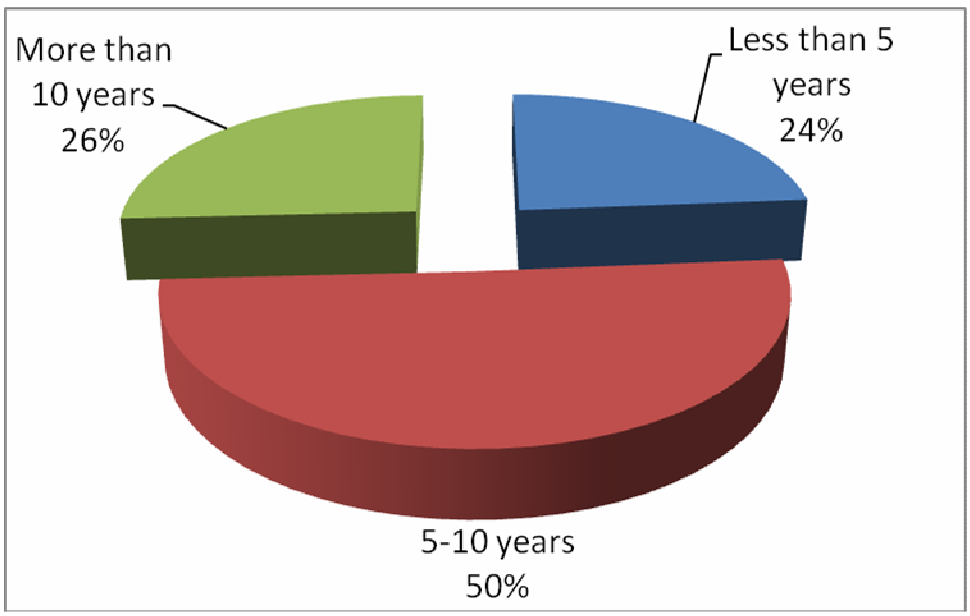


Figure (4.5) distribution of participants according to their experience

And finally findings revealed that the majority of the participants are surgeon, which represent 54.5% from the sample.

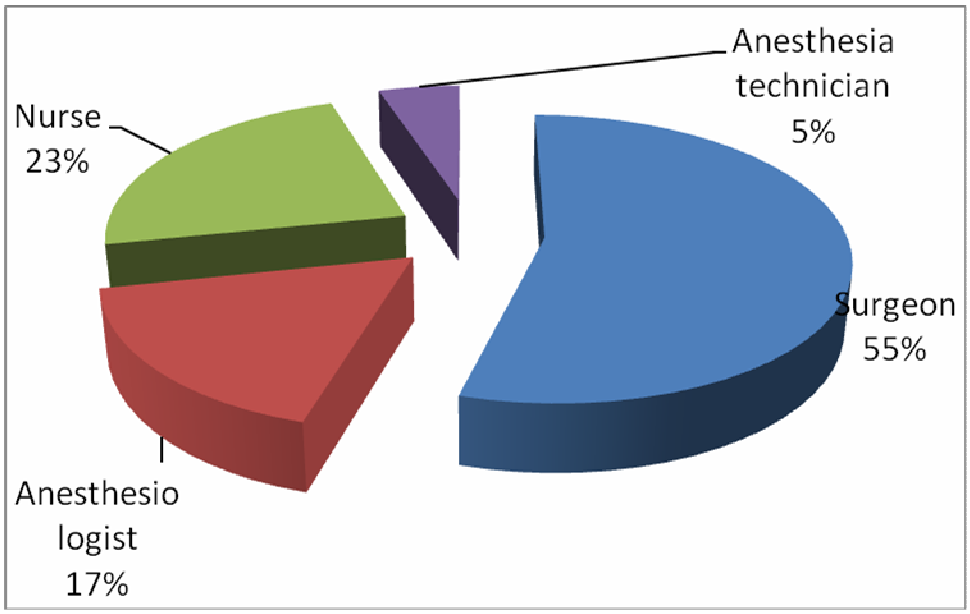


Figure (4.6) distribution of participants according to their post

4.1.1.2 Pre-operative procedures

Table(4.2.1) distribution of participant's responses in relation to the technical Pre-operative procedures

No.	Items	Category	Frequency	Valid Percent
1	Does the anesthesiologist examine the patients one day prior operation?	Yes	171	86.4
		Sometimes	21	10.6
		No	6	3.0
2	Does the anesthesiologist note his remarks in the patient's medical record?	Yes	159	80.3
		Sometimes	30	15.2
		No	9	4.5
3	Does the surgeon note his remarks in the patient's medical record?	Yes	159	80.3
		Sometimes	32	16.2
		No	7	3.5
4	Does the surgical department nursing staff prepare the patient properly before surgery?	Yes	87	43.9
		Sometimes	86	43.4
		No	25	12.6
5	Do nursing staff note their remarks in the patient's medical record?	Yes	155	78.3
		Sometimes	36	18.2
		No	7	3.5
6	Are the necessary laboratory investigations, ECG and X-Rays done before the operation?	Yes	160	80.8
		Sometimes	34	17.2
		No	4	2.0

As illustrated in table (4.2.1), the majority of participants agreed that, procedures which are done by doctors (surgeons and anesthesiologists) prior to surgery are done properly, in which 86.4% from the participants agreed that the anesthesiologist examines the patient one day prior to surgery and 80.3% from them agreed also that these doctors note their remarks in the patient's medical record, which is indicator for good documentation.

This table also shows that the participants agreed that procedures which are done by the surgical department nursing staff are not always done properly, in which just 43.9% from the participants agreed that the surgical department nursing staff prepare the patient properly before the operation, and 78.3% from them agreed that these nursing staff note their remarks in the patient's medical record prior the operation.

Qualitative results support these results in which the key informants said that there is a real problem in the pre-operative preparation of the patients as: inadequate preparation of the patients prior to surgery by nursing, and about the pre-operative preparation of the patient by the anesthesiologist: In Shifa hospital the stakeholders declared that recently an anesthesia clinic was established in the outpatient clinic for anesthesia consultation but the anesthesiologist which cover this clinic cover also C-T Scan and septic operating room, which means that not all patients are seen by the anesthesiologist prior to surgery. In Sohadaa Al Aqsa hospital they noticed that not all patient are examined by the anesthesiologist one day before the operation, but in European Gaza Hospital all of them agreed that all patients are seen by the anesthesiologist one day prior to surgery. All of these problems lead to wasting of time in ORs. and cancelling of unwell prepared patients. and which in turn create a frustration to the patients and their families. These results are consistent with the findings from other studies in Gaza-Shifa Hospital and Tel-Aviv Sourasky Medical Center (Skaik S. and et al. 2008 and Weinbroum Avi A. and et al. 2002). And so polices should be adopted to improve the pre-operative preparation of the patients.

This table also illustrates that most participants agreed that the necessary laboratory investigations, ECG and X-Rays are done before the operation, as 80.8% from the sample agreed that such investigations are done before the operation.

Table(4.2.2) distribution of participant's responses in relation to the logistic pre-operative procedures

No.	Items	Category	Frequency	Valid Percent
1	Are the patients transferred from the surgical department to the operating rooms (O.Rs) by elevator?	Yes	149	75.3
		Sometimes	30	15.2
		No	19	9.6
2	Is there an additional elevator special for ORs.?	Yes	81	40.9
		No	117	59.1
3	If the elevator malfunctioning, it can be repaired as quickly as required?	Yes	40	20.2
		Sometimes	82	41.4
		No	76	38.4
4	Is the nurse accompanied the patient while transferring him from the surgical department to the operating rooms?	Yes	144	72.7
		Sometimes	26	13.1
		No	28	14.1
5	Is the way of communication between the surgical department and ORs. to bring the patient for operation done as quickly as required?	Yes	64	32.3
		Sometimes	92	46.5
		No	42	21.2
6	Is the process of transferring the patient from the surgical department to the ORs. obtained as quickly as required?	Yes	50	25.3
		Sometimes	98	49.5
		No	50	25.3
7	Is there a waiting area for patients in the operating suite before operation?	Yes	134	67.7
		No	64	32.3
	All items of pre-operative procedures	Yes	1553	62.8
		Sometimes	748	30.2
		No	173	7

As illustrated in table (4.2.2), the patients are not always accompanied by nursing while transferring them from the surgical department to the operating rooms, as just 72.7% from the sample agree that these patients are accompanied by nursing. All patients should be accompanied by nursing in order to insure patient safety. And

75.3% from the sample agree that the patients are transported from the surgical department to the operating rooms by elevator and the majority of the participants agreed that there is no an additional elevator special for ORs. as 59.1% from the sample agree that there is no an additional elevator special for ORs. There is a real problem in the maintenance of the elevator, in which the majority of participants agreed that if the elevator malfunctioning, it cannot be repaired as quickly as required "just 20.2% from the sample agree that if the elevator malfunctioning, it can be repaired as quickly as required" , this means that there is no periodic maintenance of the elevators. This finding came in accordance with a study conducted in Shifa Hospital-Gaza (Skaik S. and et al. 2008). Therefore there is in need for urgent intervention from a hospital administration in order to enhance the regular periodic maintenance.

The table also shows that the way of communication between the surgical department and ORs. to bring the patient for operation is not always done as quickly as required, as just 32.3% from the sample agreed that the way of communication between the surgical department and ORs. to bring the patient for operation is done as quickly as required. And the process of transporting the patient from the surgical department to the ORs. is not always obtained as quickly as required," just 25.3% from the sample agreed that such process is obtained as quickly as required". And 67.7% from the sample agreed that there is a waiting area for patients in the operating suite before operation. These results are similar and in consistence with the results of other studies conducted in Tel-Aviv Sourasky Medical Center and MetroHealth Medical Center (Weinbroum Avi A. and et al. 2002 and Maureen Harders and et al. 2006). The reasons of poor communication between the surgical department and ORs. should be identified and strategy developed to overcome those reasons.

For general 62.8% from the sample agree that the Pre-operative procedures in hospitals are good, 30.2% from the sample agree moderately, and 7% from the sample disagree, which means that pre-operative procedures in hospitals are not always good. Administrative policy should be adopted to improve the pre-operative procedures.

4.1.1.3 Intra-operative procedures

Table(4.3.1) distribution of participant's responses in relation to the administrative intra-operative procedures

No.	Items	Category	Frequency	Valid Percent
1	Are the surgeons arrive to the operating suite at the appropriate time(at eight o'clock am)?	Yes	85	42.9
		Sometimes	67	33.8
		No	46	23.2
2	Are the anesthesiologists arrive to the operating suite at the appropriate time (at eight o'clock am)?	Yes	73	36.9
		Sometimes	79	39.9
		No	46	23.2
3	Are the nursing arrive to the operating suite at the appropriate time(at half past seven am)?	Yes	114	57.6
		Sometimes	56	28.3
		No	28	14.1
4	Does the number of surgeons within the ORs. appropriate with the number of operations?	Yes	116	58.6
		Sometimes	52	26.3
		No	30	15.2
5	Does the number of anesthesiologists within the ORs. appropriate with the number of operations?	Yes	79	39.9
		Sometimes	70	35.4
		No	49	24.7
6	Does the number of nursing staff within the ORs. appropriate with the number of operations?	Yes	77	38.9
		Sometimes	73	36.9
		No	48	24.2
7	Does the surgeon waste time because he does other work within ORs.?	Yes	27	13.6
		Sometimes	65	32.8
		No	106	53.5
8	Is the volume of work appropriate with the number of ORs?	Yes	41	20.7
		No	157	79.3
9	Is the emergency room in the ORs. ready at any time?	Yes	71	35.9
		Sometimes	72	36.4
		No	55	27.8

No.	Items	Category	Frequency	Valid Percent
10	Is there a protocol to accept the emergency cases in the ORs.?	Yes	119	60.1
		No	79	39.9
11	If the answer is yes, is there always commitment to that protocol?	Yes	58	48.7
		No	61	51.3
12	Is there a special form for counting the gauze within the ORs.?	Yes	157	79.3
		No	41	20.7
13	If the answer is yes, do you use this form in all cases while using this gauze?	Yes	110	70.1
		Sometimes	37	23.6
		No	10	6.4
14	Are the staff in the ORs. had a commitment to wear operating rooms clothes?	Yes	154	77.8
		Sometimes	38	19.2
		No	6	3.0

As illustrated in table (4.3.1) the surgical staff are not always arriving to the operating rooms in the appropriate time, which lead to the decrease in the daily working hours and as a result lead to postponement of some cases from the routine operating list, as shown 42.9% from the sample agreed that the surgeons arrive to the operating suite at the appropriate time (at eight o'clock am) and 36.9% from the sample agreed that the anesthesiologists arrive to the operating suite at the appropriate time (at eight o'clock am) and 57.6% from the sample agreed that nursing arrive to the operating suite at the appropriate time (at half past seven am). Policy should be adopted regarding commitment to decrease the waste time. This important finding came in accordance with other studies conducted in Gaza-Shifa Hospital and Tel-Aviv Sourasky Medical Center (Skaik S. and et al. 2008 and Weinbroum A. and et al. 2002).

This table also shows that the number of surgical staff within the ORs. are not always appropriate with the number of operations, which means that there are some shortage in surgical staff mainly in the anesthesiologists and nursing . As shown 58.6% from the sample agreed that the number of surgeons within the ORs. are appropriate with the number of operations, 39.9% from the sample agreed that the number of anesthesiologists within the ORs. are appropriate with the number of operations and

38.9% from the them agreed that the number of nursing staff within the ORs. are appropriate with the number of such operations. And it shown also that sometimes the surgeon wastes time because he does other work within ORs. "32.8% from the sample agreed that sometimes the surgeon wastes time because he does other work within ORs.". These findings came in accordance with qualitative results wherein all of key informants agreed that there is shortage of staff in the operating rooms mainly nursing and anesthesiologists. All of them agreed also that there is no waiting area for the patients prior to surgery. All of these can lead to postponement of some cases from the routine operating list. These findings are in agreement with the results of other studies conducted in Gaza-Shifa Hospital, Tel-Aviv-Sourasky Medical Center and Cleveland- MetroHealth Medical Center (Elron M. 2009, Skaik S. and et al. 2008, Weinbroum A. and et al. 2002 and Malangoni M. 2006). Strategy should be adopted to increase the needed staff in the operating rooms.

Moreover there is a serious problem in the number of operation rooms in relation to the volume of work, as 79.3% from the sample agreed that the volume of work is not appropriate with the number of ORs. This results came in accordance with qualitative results wherein the stakeholders agreed that the number of operating rooms are not appropriate with the volume of work, which lead to postponement of some cases from the routine operating list and as a result increasing the number of patients on the operating list. It also illustrate that the emergency room in the ORs. is not always ready at any time (35.9% from the sample agreed that the emergency room in the ORs. is ready at any time). And 60.1% from the sample agreed that there is an emergency protocol to accept the emergency cases in the ORs. but 51.3% from the participants who responded yes there is an protocol, agreed that there is no always commitment to that protocol. Administrative strategy and policy should be considered for establishment of an emergency protocol. These findings are similar to the findings of previous studies which were conducted in Gaza-Shifa Hospital (Skaik S. and et al. 2008 and Elron M. 2009). Furthermore 79.3% from the sample agreed that there is a special form for counting the gauze within the ORs. and 70.1% from the respondents who responded yes agreed that this form is used in all cases while using this gauze, which is a good indicator for patients safety. Additionally 77.8% from the sample agree that the staff in ORs. had a commitment to wear operating rooms clothes, which is a good indicator for prevention infection control.

Table(4.3.2) distribution of participant's responses in relation to the environmental intra-operative procedures

No.	Items	Category	Frequency	Valid Percent
1	Are there permanent porters within the ORs. to bring patients?	Yes	91	46.0
		No	107	54.0
2	Are the number of these workers within the operating rooms enough?	Yes	41	20.7
		No	157	79.3
3	Are there permanent cleaners within the operating rooms?	Yes	129	65.2
		No	69	34.8
4	Are the number of cleaners within the operating rooms enough?	Yes	64	32.3
		No	134	67.7
5	Is air conditioning within the ORs. Working properly?	Yes	14	7.1
		Sometimes	92	46.5
		No	92	46.5
6	If there is malfunctioning in air conditioning within the ORs., can it be repaired as quickly as required?	Yes	5	2.5
		Sometimes	60	30.3
		No	133	67.2
7	Is there a harmony among the operating rooms staff(surgeons, anesthesiologists and nursing) and working as a team?	Yes	68	34.3
		Sometimes	98	49.5
		No	32	16.2
8	Is the staff movement in the ORs. smooth and easy to the required level?	Yes	55	27.8
		Sometimes	80	40.4
		No	63	31.8

As shown in previous table there is no permanent porters within the ORs. to bring patients and they are not adequate, which lead to delay of transporting the patients from the surgical department to ORs. and as a result postponement of some cases from the routine operating list, as shown in this table 54.0% from the sample agreed that there is no permanent porters within the ORs. and 79.3% from them agreed that they are not adequate. This result was reflected throughout the qualitative findings in which stakeholders agreed that there is shortage of porters and cleaners. This result

also is consistent with the findings from other studies conducted in MetroHealth Medical Center, Tel-Aviv Sourasky Medical Center and Medical University of South Carolina (Maureen H. and et al. 2006, Weinbroum A. and et al. 2002 and Overdyk and et al. 1998).

Furthermore most participants agreed that the number of cleaners within the operating rooms are not adequate (67.7% from the sample agreed that the number of cleaners within the operating rooms are not enough), this means that there is a waste of time in operating rooms which lead to patients delay. This result is consistent with the findings from a study conducted in MetroHealth Medical Center (Maureen H. and et al. 2006). This table illustrate also that air conditioning within the ORs. is not always working properly, (just 7.1% from the sample agree that air conditioning within the ORs. is working properly), and it proves that if there is malfunctioning in air conditioning within the ORs., it cannot be repaired as quickly as required (just 2.5% from the sample agreed that if there is malfunctioning in air conditioning within the ORs., it can be repaired as quickly as required). Policy should be adopted to improve periodic maintenance for hospital's equipments.

In this table it is shown also that there is no always a harmony among the operating rooms staff (surgeons, anesthesiologists and nursing) and they are not always working as a team, which lead to occurrence of conflict among them, "just 34.3% from the sample agreed that there is always a harmony among them and 49.5% sometimes". In addition the table show that the staff movement in the ORs. is not always smooth and easy to the required level, as just 27.8% from the sample agreed that the staff movement in the ORs. is smooth and easy. Policy should be adopted regarding protocols and guidelines that regulate the work in the ORs. and also regarding job description for each employee. This finding support the findings of a study conducted in Shifa Hospital-Gaza (Skaik S. and et al. 2008).

Table(4.3.3) distribution of participant's responses in relation to the logistic intra-operative procedures

No.	Items	Category	Frequency	Valid Percent
1	are the tools and surgical instruments within the ORs. always enough for work?	Yes	49	24.7
		Sometimes	80	40.4
		No	69	34.8
2	Are the quality of tools and surgical instruments within the ORs. correspond with the required specifications?	Yes	44	22.2
		Sometimes	85	42.9
		No	69	34.8
3	Are surgical supplies always available in the ORs.?	Yes	38	19.2
		Sometimes	89	44.9
		No	71	35.9
4	Are anesthesia supplies always available in the ORs.?	Yes	58	29.3
		Sometimes	119	60.1
		No	21	10.6
5	Are anesthesia drugs always available in the ORs.?	Yes	58	29.3
		Sometimes	118	59.6
		No	22	11.1

The table (4.3.3) illustrate that the surgical instruments, anesthesia supplies and drugs are not always available in the operating rooms, in which just 19.2% from the sample agreed that surgical supplies are not always available and 29.3% from the sample agreed that anesthesia supplies are not always available. In addition there is a problem in the quality of these surgical instruments, as just 22.2% from the sample agreed that the quality of tools and surgical instruments within the ORs. correspond with the required specifications. Qualitative results support these findings in which all of the interviewed participants agreed that there is shortage of surgical and anesthesia supplies, in addition the quality of tools and surgical instruments within the ORs. are not correspond with the required specifications.

These findings came in accordance with other studies conducted in Gaza-Shifa Hospital (Skaik S. and et al. 2008 and Elron M. 2009).

Table(4.3.4) distribution of participant's responses in relation to the technical intra-operative procedures

No.	Items	Category	Frequency	Valid Percent
1	Is the operating table functioning properly?	Yes	67	33.8
		Sometimes	85	42.9
		No	46	23.2
2	Are the anesthesia machines functioning properly?	Yes	98	49.5
		Sometimes	78	39.4
		No	22	11.1
3	Are the patient monitors in the operating rooms functioning properly?	Yes	90	45.5
		Sometimes	87	43.9
		No	21	10.6
4	Is there regular maintenance for equipment in operating rooms?	Yes	35	17.7
		Sometimes	76	38.4
		No	87	43.9
	All items of intra-operative procedures	Yes	2359	38.8
		Sometimes	2502	41.2
		No	1218	20.0

As illustrated in table (4.3.4) the operating table, anesthesia machines and patient monitors in the operating rooms are not always functioning properly, (33.8% from the sample agreed that the operating table is functioning properly, 49.5% from the sample agreed that the anesthesia machines are functioning properly and 45.5% from the sample agreed that the patient monitors in the operating rooms are functioning properly). This table show that there is a real problem in maintenance of operating room's equipments in which the majority of the participants agreed that there is no regular maintenance for equipments in operating rooms (just 17.7% from the sample agreed that there is regular maintenance for equipments in operating rooms). These results were supported by the qualitative results wherein all of the interviewed managers agreed that there is no periodical maintenance of equipments, in addition to shortage of spare parts for maintenance. Policy should be adopted to enforce periodic

maintenance for hospital's equipments. This finding is in agreement with the results of a study conducted in Shifa Hospital-Gaza (Skaik S. and et al. 2008).

For general 38.8% from the sample agree that "Intra-operative procedures are good", 41.2% from the sample agree "moderately ", and 20.0% from the sample disagree, which means that intra-operative procedures are not always good. Administrative policy should be adopted to improve the intra-operative procedures.

4.1.1.4 Turnover time

Table (4.4) Turnover time

The time between the finishing of one operation and the introduction of another case	**Frequency**	**Percentage**
Less than 15 minutes	74	37.4
From 15-25 minutes	78	39.4
More than 25 minutes	46	23.2
Total	198	100.0

Table (4.4), show that 37.4% from the sample agreed that the turnover time is Less than 15 minutes, 39.4% from 15-25 minutes, and 23.2% more than 25 minutes. Which mean that the majority of participants agreed that turnover time is less than 25 minutes. This important finding is a good indicator according to a study conducted in USA which identified that, turnover time at the best performing operating rooms average should be less than 25 minutes. (Dexter F. and et al.2007).

4.1.1.5 Post- operative procedures

Table (4.5) distribution of participant's responses in relation to the Post-operative procedures

No.	Items	Category	Frequency	Valid Percent
1	Is the recovery room equipped properly as required?	Yes	88	44.4
		No	94	47.5
		I do not know	16	8.1
2	Is the number of beds in the recovery room appropriate with the number of operations?	Yes	104	52.5
		No	94	47.5
3	Are the patient's monitors in the recovery room functioning properly?	Yes	58	29.3
		Sometimes	79	39.9
		No	61	30.8
4	Does the surgeon note his remarks after surgery?	Yes	181	91.4
		Sometimes	15	7.6
		No	2	1.0
5	Does the anesthesiologist notes his remarks after surgery?	Yes	93	47.0
		Sometimes	68	34.3
		No	37	18.7
6	Does the nurse accompany the patient while transferring him from the operating rooms to the surgical department?	Yes	158	79.8
		Sometimes	29	14.6
		No	11	5.6
	All items	Yes	682	57.4
		Sometimes	379	31.9
		No	127	10.7

As shown in table (4.5) 44.4% from the sample agree that the recovery room is equipped properly as required and 47.5% from the sample disagree. 52.5% from the sample agree that the number of beds in the recovery room is appropriate with the number of operations and 47.5% from the sample disagree. This table also show that there is a real problem in maintenance of ORs. equipments, as just 29.3% from the sample agree that the patient's monitors in the recovery room are functioning properly. Qualitative findings support these results in which All of the interviewed participants in Shifa Hospital and European Gaza Hospital answered that the recovery room is not well equipped in addition to shortage of monitors and shortage of nursing in this room, but in Shohadaa Al Aqsa Hospital they said that there is no recovery room in the ORs. which is a bad indicator for patient safety. And as mentioned before administrative strategy and policy should be adopted to enforce periodic maintenance for hospital's equipments.

Additionally in this table it is shown that the procedures which are done by surgeons after the operation are done properly, but these procedures are not done properly by anesthesiologists, (91.4% from the sample agree that the surgeon notes his remarks after operation and 47.0 % from the sample agree that the anesthesiologist notes his remarks after operation), which is similar with the findings of a study conducted by Elron M. in Shifa Hospital (2009). And 79.8% from the sample agree that the nurse accompany the patient while transferring him from the operating rooms to the surgical department, which is good indicator for patient safety.

For general 57.4% from the sample agree that "Post- operative procedures are good", 31.9% from the sample agree moderately, and 10.7% from the sample disagree, which means that post- operative procedures are not always good. Therefore there is in need for urgent intervention from a hospital administration in order to improve post-operative procedures.

4.1.1.6 administrative procedures

Table(4.6) distribution of participant's responses in relation to the administrative procedures

No.	Items	Category	Frequency	Valid Percent
1	Is the routine operating list documented one day before operation?	Yes	180	90.9
		Sometimes	17	8.6
		No	1	0.5
2	If the answer is yes, is it documented on the computer?	Yes	87	48.3
		Sometimes	22	12.2
		No	71	39.4
3	Is there a medical secretary in the operating rooms?	Yes	21	10.6
		No	177	89.4
4	Is there a computerized system in the ORs. connected to other departments?	Yes	51	25.8
		No	147	74.2
5	Are the documents related to the patient in the ORs. completed?	Yes	89	44.9
		Sometimes	71	35.9
		No	38	19.2
6	Are there written protocols and guidelines, that regulate the work in the ORs.?	Yes	70	35.4
		No	59	29.8
		I do not know	69	34.8
7	If the answer is yes, are these protocols and guidelines clear for all employees?	Yes	51	72.9
		No	19	27.1
8	Are the ORs. management able to solve everyday problems?	Yes	99	50.0
		No	99	50.0
9	Are the hospital administration responds to meet the demands of ORs.?	Yes	33	16.7
		Sometimes	119	60.1
		No	46	23.2

No.	Items	Category	Frequency	Valid Percent
10	Is there a waste of time in the operating rooms?	Yes	60	30.3
		Sometimes	111	56.1
		No	27	13.6
	All items	Yes	741	40.4
		Sometimes	841	45.9
		No	252	13.7

As illustrated in table (4.6) the majority of participants agreed that the routine operating list is documented one day before operation (90.9% from the sample agree that the routine operating list is documented one day before operation) but it is not always documented on the computer (48.3% from the sample agree that it is documented on the computer).

The results reveal that there is no a medical secretary in the operating rooms (89.4 % from the sample agreed that there is no a medical secretary in the operating rooms). The results reveal also that there is no a computerized system in the ORs. connected to other departments (74.2% from the sample disagree). It is shown that the documents related to the patient in the ORs. are not always completed (44.9% from the sample responded always and 35.9% from the sample responded sometimes). All of these mean that there is a real problem on documentation which is a basic for prober evaluation and management of patients which lead to optimal health care, and this need assessment to identify the real causes of this problem and apply appropriate intervention. These findings are in agreement with the results of other studies previously conducted in Gaza- Shifa Hospital (Skaik S. and et al. 2008 and Elron M. 2009).

Findings as shown in table (4.6) illustrated that there is no written protocols and guidelines, that regulate the work in the ORs. as 29.8% from the sample disagree, and 34.8% from the sample do not know if there are written protocols and guidelines in ORs. These results came in accordance with qualitative findings wherein all stakeholders agreed that there is work overload, absence of clear job description, absence or unclearness of written policy, protocols and guidelines that regulating the work, inappropriate computerized documentation system, absence of incentives,

rewards and punishment, absence of effective supervision and follow up, lack of in service training program, poor maintenance and the quality improvement committee is not effective Administrative strategy and policy should be adopted to enforce establishment of written protocols and guidelines according to standards which are of great value for regulating all the processes and procedures on providing health care for patients admitted to the hospital. These findings are also in agreement with the results of other studies previously conducted in Gaza- Shifa Hospital (Skaik S. and et al. 2008 and Elron M. 2009).

Furthermore this table illustrated that the operating room's management are not always able to solve everyday problems (50.0% from the sample agree) and in the same time the hospital's administration not always respond to meet the demands of ORs. (16.7% from the sample agree always and 60.1% from the sample agree sometimes).

This table also illustrate that there is a waste of time in the operating rooms (13.6% from the sample disagree), which lead to postponement of some cases from the routine operating list and as a result increasing the number of patients on the waiting list. And most respondents agreed that the most important three reasons for wasting time are: First: Absence of written protocols and guidelines, that regulate the work in the operating rooms. Second: Shortage of workers and cleaners in operating rooms. And finally Absence of rewards and accountability system. Urgent administrative assessment should be applied in order to overcome those reasons.

For general 40.4% from the sample agree that "administrative procedures are suitable", 45.9% from the sample agree moderately, and 13.7% from the sample disagree, which means that administrative procedures are not always suitable. Administrative policy should be adopted to improve the administrative procedures.

4.1.1.7 The number of daily working hours of the routine operating list

Table (4.7) distribution of participant's responses in relation to the number of daily working hours of the routine operating list

The number of daily working hours of the routine operating list	Frequency	Percentage
Appropriate with the number of operations	**67**	**33.8**
Not appropriate	**131**	**66.2**
Total	**198**	**100.0**
Do you think that the number of daily hours should be		
8 hours	**79**	**39.9**
10 hours	**105**	**53.0**
12 hours	**14**	**7.1**
Total	**198**	**100.0**

The previous table illustrated that the number of daily working hours of the routine operating list are not appropriate with the number of operations, which is considered one of the most important reasons of the postponement of some cases from the routine operating list and then increasing the number of patients on the waiting list. (66.2% agreed that the number of daily working hours of the routine operating list are not appropriate with the number of operations). And the table also illustrate that the majority of participants think that the number of daily hours for routine operating list should be 10 hours (53% think that the number of daily hours for routine operating list should be 10 hours). Qualitative results support these findings in which all key informants noticed that the number of daily working hours of the routine operating list are not appropriate with the number of operations and the number of daily working hours of the routine operating list are not appropriate with the number of operations. Policy should be adopted to increase the daily working hours of the routine operating list in the operating rooms.

4.1.1.8 The possibility and reasons of postponement of some cases from the routine operating list

Table (4.8) distribution of participant's responses in relation to the possibility and reasons of postponement of some cases from the routine operating list

Is there postponement of some cases from the routine operating list?	**Frequency**	**Percentage**
Always	**71**	**35.9**
Sometimes	**123**	**62.1**
No	**4**	**2.0**
Total	**198**	**100.0**
Do you think that the reason is due to:		
Daily working hours are not appropriate with the number of operations.	**117**	**22.7**
The number of operation rooms are not appropriate with the number of operations.	**116**	**22.5**
Delay of transferring the patients from the surgical department to ORs..	**79**	**15.3**
The patients are not prepared properly.	**72**	**14.0**
Shortage of Staff in operating rooms	**70**	**13.6**
Lack of harmony among the staff in operating rooms (surgeons, anesthesiologists and nursing).	**62**	**12.0**
Total	**516**	**100.0**

The previous table illustrated that there is sometimes postponement of some cases from the routine operating list(62.1% responded sometimes). And this can lead to increasing the number of patients on the waiting list. And the table show that the reasons of such postponement as the following:

- Daily working hours are not appropriate with the number of operations with "first" rank.

- The number of operation rooms are not appropriate with the number of operations with "second" rank.
- Delay of transferring the patients from the surgical department to ORs "third" rank.
- The patients are not prepared properly with "forth" rank.
- Shortage of Staff in operating rooms with "fifth" rank.
- Lack of harmony among the staff in operating rooms (surgeons, anesthesiologists and nursing). with "sixth" rank.

The efficient use of operating time is very important to decrease waiting lists. So In order to improve the utilization of operating rooms it is important to know how much time is spent on each activity (Jan F. and et al, 2003). Therefore assessment of the time factor involved in the operating theaters should be applied in order to overcome the causes of postponement of cases in the operating rooms.

4.1.1.9 The impact of current political situation

Table (4.9) distribution of participant's responses in relation to their point of view about the impact of current political situation

Do you think that the siege and the current political situation have a major role in:	Frequency	Percentage
Increase the number of patients in the operating list.	126	31.6
Shortage and poor quality of equipments and supplies in the ORs.	123	30.8
Shortage of staff in the ORs.	89	22.3
Lack of harmony among staff and occurrence of chaos in the ORs	61	15.3
Total	399	100.0

Findings in table (4.9) reveal that the siege and the current political situation have a major role in:

- Increase the number of patients in the operating list with "first" rank.

- Shortage and poor quality of equipments and supplies in the ORs. with "second" rank.
- Shortage of staff in the ORs. with "third" rank.
- Lack of harmony among staff and occurrence of chaos in the ORs with "forth" rank.

These results were supported by the qualitative results wherein all stakeholders agreed that the majority of staff are unsatisfied because of political instability and fragmentation, which interfere with their productivity and as a result lead to patient delay and increasing the number of patients on the waiting list

4.1.1.10 The best three things that can lead to optimal use of ORs.

- Adopting written protocols and guidelines that regulate the work in operating rooms, and establishing a job description for all staff members.
- Increasing the daily working hours of the routine operating list.
- Applying a promotion (incentives and rewards) system for the health working staff.

4.1.1.11 The worst three things that can impede the work in the ORs.

- Daily working hours are not appropriate with the number of operations.
- Absence of protocols and guidelines that regulate the work in operating rooms in addition to Absence job description for each employee.
- Lack of periodic maintenance of operating room's equipments.

And Finally, the interviewed managers proposed some strategies in order to improve the quality of care in the operating rooms as:

- Necessity of presence of job description for each post.
- Establishment of computerized recording system.
- Constructing a committee for developing a standardized protocols and guidelines.

- Adoption of rewards and motivation system.
- Increasing the nursing and anesthesia staff.
- Encouraging the system of in service training.
- Creating a research committee.
- Creating a coordinating office for patient services between departments and reactivating the quality improvement committee.

4.1.2 Inferential analysis

In this section the researcher presents the differences in the current utilization of operating theaters and the time factor involved in these theaters in relation to the type of procedure (Pre-operative procedures , Intra-operative procedures , Post- operative procedures and administrative procedures), type of hospital and type of post.

4.1.2.1 Type of procedure

Table (4.10) differences due to type of procedure

Section	Mean Rank	Chi-Square test	p-value
Pre-operative procedures	1.79	204.32	0.000
Intra-operative procedures	3.37		
Post- operative procedures	1.96		
administrative procedures	2.88		

Friedman Test was used to examine the differences in the current utilization of operating theaters and the time factor involved in these theaters in relation to the type of procedure (Pre-operative procedures , Intra-operative procedures , Post- operative procedures and administrative procedures), and as shown in table (4.10) the p-value equal 0.000 which is less than 0.05, which mean that there is a statistically significant difference in the correspondents of the sample between these procedures at significant level $\alpha = 0.05$, where the Pre-operative procedures is the first one and Intra-operative procedures is the last rank.

4.1.2.2 Type of hospital

Table (4.11) differences due to type of hospital

Section	Mean rank			Chi-Square	d.f	p-value
	Shifa Hospital	EGH	Shohada Alqsa Hospital			
Pre-operative procedures	104.79	98.43	85.96	2.870	2	0.238
Intra-operative procedures	105.94	88.58	99.77	3.504	2	0.173
Post-operative procedures	112.13	59.18	132.97	47.971	2	0.000
administrative procedures	120.38	47.33	129.59	74.213	2	0.000
All sections	110.36	76.71	107.56	14.006	2	0.001

Kruskal-Wallis Test was used to examine the differences in the current utilization of operating theaters and the time factor involved in these theaters in relation to the type of hospitals, and the previous table illustrated that, there is a statistically significant difference at post-operative procedures and administrative procedures in relation to the type of hospitals, since the p- value equal 0.000 for each, which is less than 0.05, and for general the p-value equal for all sections equal 0.000 which is less than 0.05 , which mean that there is a statistically significant difference in the correspondents of the sample of the current utilization of operating theaters and the time factor involved in these theaters due the type of hospitals at significant level $\alpha = 0.05$, in which the EGH is the first one.

4.1.2.3 Type of post

Table (4.12) differences due to type of post

Section	Mean rank				Chi-Square	d.f	p-value
	Surgeon	Anesthesiologist	Nurse	Anesthesia technician			
Pre-operative procedures	106.19	98.96	87.96	82.25	4.282	3	0.233
Intra-operative procedures	116.46	85.24	69.50	102.80	24.223	3	0.000
Post-operative procedures	101.50	119.59	82.10	89.70	9.009	3	0.029
administrative procedures	103.30	116.34	74.85	114.65	12.701	3	0.005
All sections	113.16	95.56	70.23	100.00	18.307	3	0.000

Kruskal-Wallis Test was used to examine the differences in the current utilization of operating theaters and the time factor involved in these theaters in relation to the type post, and the previous table results revealed that there is a statistically significant difference at intra-operative procedures , post-operative procedures and administrative procedures in relation to the type of post, since the p- value for each are less than 0.05, and for general the p-value for all sections equal 0.000 which is less than 0.05, which mean that there is a statistically significant difference in the correspondents of the sample of the current utilization of operating theaters and the time factor involved in these theaters due to Post at significant level $\alpha = 0.05$, wherein the nurse are the most satisfied from the procedures and the surgeons are the less satisfied.

4.2 Results from reviewing of record checklist

100 files of discharged patients were reviewed for the availability and completeness of records related to patient's admission, preoperative care , post operative care, discharge records and signature of the surgical staff.

4.2.1 Descriptive analysis

4.2.1.1 Descriptive demographic data of records.

Table (4.13) descriptive demographic data of records.

S n.	Item	Frequency	Percentage
1.	**Hospital name**		
	shifa hospital	50	50.0
	European Gaza hospital	30	30.0
	Sohadaa Alqsa hospital	20	20.0
	Total	100	100.0
2.	**Sex**		
	Male	58	58.0
	Female	42	42.0
	Total	100	100.0
	Age in Years		
3.	Under 18	22	22.0
	18-39	36	36.0
	40 and above	42	42.0
	Total	100	100.0
	Admission method		
4.	Emergency	34	34.0
	Outpatient	66	66.0
	Total	100	100.0

Table (4.13) show that 50% from the sample are from "Shifa hospital", 30.0% from "European Gaza hospital ", and 20.0% from "Sohadaa Alqsa hospital".

The table show also that 58.0 % from the sample are "Male", and 42.0% are "Female" .

This table illustrate that 22.0% from the sample ages "Less than 18 years", 36.0% between "18-39 years", and 42.0% from the sample ages "42 and above".

Moreover the findings reveal that 34.0% from the sample, the admission method are " Emergency" and 66.0% are " Outpatient ".

4.2.1.2 pre-operative procedures

Table (4.14.1): Availability and completion of files in relation to pre-operative procedures.

No.	Items	Category	Frequency	Valid Percent
1	General data sheet	available and completed	100	100.0
		available and not completed	0	0.0
		not available	0	0.0
2	Admission sheet	available and completed	100	100.0
		available and not completed	0	0.0
		not available	0	0.0
3	History and physical examination	available and completed	24	24.0
		available and not completed	2	2.0
		not available	74	74.0

No.	Items	Category	Frequency	Valid Percent
4	Consultation notes	available and completed	41	41.0
		not available	59	59.0
5	Referral sheet	available and completed	30	30.0
		not available	70	70.0
6	Operation consent form	available and completed	99	99.0
		not available	1	1.0
7	Vital signs sheet	available	100	100.0
		not available	0	0.0
8	Nursing notes	available	100	100.0
		not available	0	0.0

As illustrated in table (4.14.1), most of records of pre-operative procedures are available and completed in the patient file like admission sheet, General data sheet, Vital signs sheet and Nursing notes which are completed by 100%, but there are a real defect in performing procedures done by doctors as: history and physical exanimation in availability of records and its completion, in which just about 24% of these records are completed, and this finding is slightly higher than the result which was founded in Elron study (2009), that was conducted in Shifa Hospital in Gaza Strip (4.2% was completed), lack of referral sheets and in its filling, about 30% are available, which is higher than that it was founded in Elron study (9% was available). Referral sheet should be a part of the file mainly for those who are undergoing elective surgery. The majority of consultation notes are not available and uncompleted, about 59% are not available. In Elron study (2009), there was 72% not available. All of these records should be available and completed with 100% according to the need of patients care (management and follow up) .

Table (4.14.2): Availability and completion of files in relation to pre-operative investigations.

No.	Items	Category	Frequency	Valid Percent
1	CBC	available	96	96.0
		not available	4	4.0
2	Urea and creatinine	available	64	64.0
		not available	23	23.0
		not requested	13	13.0
3	Liver function test	available	38	38.0
		not available	45	45.0
		not requested	17	17.0
4	Hepatitis B (Australia antigen)	Available	5	5.0
		not available	95	95.0
5	Serum electrolytes	available	54	54.0
		not available	30	30.0
		not requested	16	16.0
6	Blood sugar	available	54	54.0
		not available	30	30.0
		not requested	16	16.0
7	X-ray	available	54	54.0
		not available	29	29.0
		not requested	17	17.0
8	ECG	available	38	38.0
		not available	33	33.0
		not requested	29	29.0
	All items of pre-operative procedures	available	996	62.2
		not available	350	21.9
		not requested	254	15.9

The results of previous table reveal that CBC which is amendatory basic investigation for all admitted patients is available by 96% of file records and the findings show that 4% are not available, it could be missed or lost. The findings also illustrate that there is a real defect in availability and completion of most investigations such as urea and creatinine (23% are not available); Liver function test (45% are not available); Serum electrolytes (30% are not available); Blood sugar (30% are not available); X-ray (29% are not available); ECG (33% are not available). All these findings are the same as those founded in Elron study (2009). In addition all of these investigations should be available and completed with 100% according to the need of patients care (management and follow up). Additionally there is real defect in availability and completion of Hepatitis B (Australia antigen), in which 95% are not available. This investigation should be available and completed with 100%, which is very important for health providers safety. Administrative strategy should be adopted in order to improve the pre-operative procedures.

4.2.1.3 Post-operative procedures

Table (4.15): Availability and completion of files in relation to post-operative procedures.

No.	Items	Category	Frequency	Valid Percent
1	Follow up sheet	available and completed	100	100.0
		not available	0	0.0
2	Operative notes	available and completed	97	97.0
		not available	3	3.0
3	Anesthesia sheet	available and completed	22	22.0
		not available	78	78.0
4	Post operative analgesia	available and completed	75	75.0
		not available	25	25.0
5	Recovery sheet	available and completed	16	16.0
		not available	84	84.0
	Total	available	310	62.0
		not available	190	38.0

The findings in the table (4.15), illustrate that some post-operative procedures are available and completed in the patient records file such as: follow up sheet which is available and completed by 100%, operative notes which is available and completed by 97%, but there is a real defect in availability and completion of some records especially those of vital importance in availability and completion as(anesthesia sheet , recovery sheet and post operative analgesia) which is essential for legal aspect and patient's management and follow up. These findings are similar to those founded in Elron study (2009). Assessment and identifying the barriers of completion of these records, and intervention should be applied.

4.2.1.4 Discharge record

Table (4.16) availability and completion of files in relation to discharge records

No.	Items	Category	Frequency	Valid Percent
1	Discharge sheet(DS)	available and completed	100	100.0
		available and not completed	0	0.0
2	Treatment recorded in DS	available and completed	100	100.0
		available and not completed	0	0.0
5	Recommendation	available and completed	50	50.0
		available and not completed	50	50.0
6	Appointment for follow up DS	available and completed	93	93.0
		available and not completed	7	7.0
	Total	available and completed	343	85.8
		available and not completed	57	14.3

The table results show that discharge sheet is available in all reviewed files but there is a problem in its filling regarding the recommendations for the discharged patients "50% are not completed". This finding is best than that was founded in Elron study (2009), wherein 67% are not completed . Administrative strategy and policy should be considered regarding discharge plane due to its impact on quality of care (patients and family).

4.2.1.5 Signature of surgical staff

Table (4.17) availability and completion of files in relation to signature of surgical staff .

No.	Items	Category	Frequency	Valid Percent
1	Name of provided- doctor	available	100	100.0
		not available	0	0.0
2	Signature of provided-doctor	available	100	100.0
		not available	0	0.0
3	Name of provided nurse	available	19	19.0
		not available	81	81.0
4	Signature of provided nurse	available	100	100.0
		not available	0	0.0
5	Name of Anesthesiologist	available	18	18.0
		not available	82	82.0
6	Signature of Anesthesiologist	available	18	18.0
		not available	82	82.0
	Total	available	355	59.2
		not available	245	40.8

As illustrated in table (4.17), there is a real defect in availability and completion of files in relation to signature of surgical staff, regarding to the name of provided nurse "81% are not available", and name and signature of anesthesiologist "82% are not available". The name and signature of surgical staff should be completed with 100%, which is very important for legal aspect. Regarding the name and signature of provided surgeon, the findings are better than those founded in Elron study (2009), in which 89% of provided surgeon name was available and 70% of provided surgeon signature was available while in this study 100% of these names and signatures are available. Furthermore in regard to the name of provided nurse, the results of this study are less than those founded in Elron study (2009), in which 55% was available, while the their signature are better than those founded in Elron study (2009), wherein 43% are not available.

5-Conclusion and recommendation

This chapter provides the main conclusions of this study as well as some recommendations for decision makers that may help in adopting better utilization of operating theaters in governmental hospitals in Gaza governorates.

5.1 Conclusion

Assessing the procedures and processes performed in operation rooms is the first step of evaluating the quality of care and efficiency of utilization of these rooms. The main objective of this study is to assess the current utilization of operating theaters and the time factor involved in these theaters in governmental hospitals in Gaza Governorates. The study topic was selected due to the problems of poor understanding of processes and procedures related to the utilization of these theaters such as: patient admission, pre-operative preparation for surgery, intra-operative and post-operative patient care, in addition to administrative procedures. In this research the researcher used triangulated approach: first, structured questionnaire with medical staff of operation rooms (220 questionnaires), second, In-depth interview with nine operating rooms managers and finally Reviewing of one hundred files and records (presence of standard procedures and protocols).

The study results show that most procedures which are done by doctors (surgeons and anesthesiologists) are performed properly but there is a serious problem in pre-operative nursing preparation, consultation, referral sheet which leads to canceling of unwell prepared patients and wasting of time in the operating theaters. Also there is ethical and medico-legal problems concerning medical staff and patients which clearly represented in absence of anesthesia sheet and recovery sheet in approximately 80% of patients file.

The study results also show that the turnover time in the operating rooms is less than 25 minutes which it is considered a good indicator according to a study conducted in USA which identified that, turnover time at the best performing operating rooms average should be less than 25 minutes.

The results of this study revealed that there is shortage of staff in the operating theaters mainly nursing and anesthesiologists. In addition to shortage of surgical and anesthesia supplies. And absence of periodical maintenance of equipments. Furthermore the number of operating rooms are not appropriate with the volume of

work, and the number of daily working hours of the routine operating list are not appropriated with the number of operations, which it was considered the most important reason of the postponement of some cases from the routine operating list and then increasing the number of patients on the waiting list.

The study results also illustrate that there is lack of health indicators which are important for evaluating the outcome, in addition to absence of clear job description, absence or unclearness of written policy, protocols and guidelines that regulating the work, absence of incentives, rewards and punishment, absence of effective supervision and follow up, lack of in service training program, and the quality improvement committee is not effective. Moreover there is inappropriate documentation system and absence of computerized recording system, mainly in Shifa Hospital and Shohadaa Alaqsa Hospital.

The study findings demonstrate also that the majority of staff are unsatisfied because of political instability and fragmentation, which interfere with their productivity and as a result lead to patient delay and increasing the number of patients on the waiting list.

Regarding the availability and completeness of records in patients files the study revealed that most of needed records are available and completed in the file but the serious problem is present in the completion of some records especially filing of pre-operative history taking and physical assessment of the patient, there was a clear defect in the completeness of the anesthesia and recovery sheets which are essential for patients follow up and medico legal aspect which are absent in approximately 80% of patients files. In addition to unavailability of some investigations especially hepatitis B (Australia antigen), which is very important for health providers safety, in which 95% are not available. Moreover results show that discharge sheet is available in all reviewed files but there is a problem in its filling regarding the recommendations for the discharged patients in which 50% are not completed.

There were a statistically significant difference in the correspondents of the sample of the current utilization of operating theaters and the time factor involved in these theaters in governmental hospitals in Gaza Governorates due the type of hospitals in which the EGH was in the first rank.

And finally the participants proposed some strategies in order to improve the quality of care in the operating rooms as: necessity of presence of job description for each

post, establishment of computerized recording system, constructing a committee for developing a standardized protocols and guidelines, adoption of rewards and motivation system, increasing the nursing and anesthesia staff, encouraging the system of in service training, creating a research committee, creating a coordinating office for patient services between departments and reactivating the quality improvement committee.

5.2 Recommendations

5.2.1 Recommendations to the Ministry of Health

- Adopting policies or reforming the available polices according to scientific base.
- Policies must be written and well known to all health care providers and should be revised periodically.
- Recreating a quality improvement committee in order to improve the quality of outcomes in operating theaters.
- Adopting a standards for procedures practiced in the operating theaters, starting from admission to discharge.
- All procedures performed in operating theaters should be adherent to standards, protocols and guidelines.
- Applying a promotion (incentives and rewards) system for the health care providers.
- Enforcement of job description for all staff members.
- Creating a research committee.
- Establishment of computerized recording system.

5.2.2 Recommendations for the decision makers and managers of hospitals.

- Revision of the available regulations or initiating new regulations, including standards, protocols, guidelines and polices and to establish a mechanism for the provision and follow up of these regulations.
- Modification and improvement of the current documentation process as to be more informative and serve as a tool to communicate patient care.

- Establishing a manual procedure booklet based on standards.
- Adoption of indicators to measure and monitor the efficiency of the quality of care in the operating theaters.
- Improving the communication and coordination between the operating theaters and other departments in the hospitals.
- Creating a coordinating office for patient services between departments.
- Initiating in service training programs that focusing on orientation to the principles of a standardized procedures and teaching practical skills through the daily practice.
- Adoption of a parallel processing in the operating theaters and constructing anesthesia induction room in each theater.

5.2.3 Recommendations for further research

- Other studies are needed to investigate the effects of the application standardized procedure on the quality of care and patient's health and satisfaction.
- Further studies are needed to evaluate the barriers of adherence to policy standards from health care provider's perspectives.
- Further study to assess the operating theaters efficiency.

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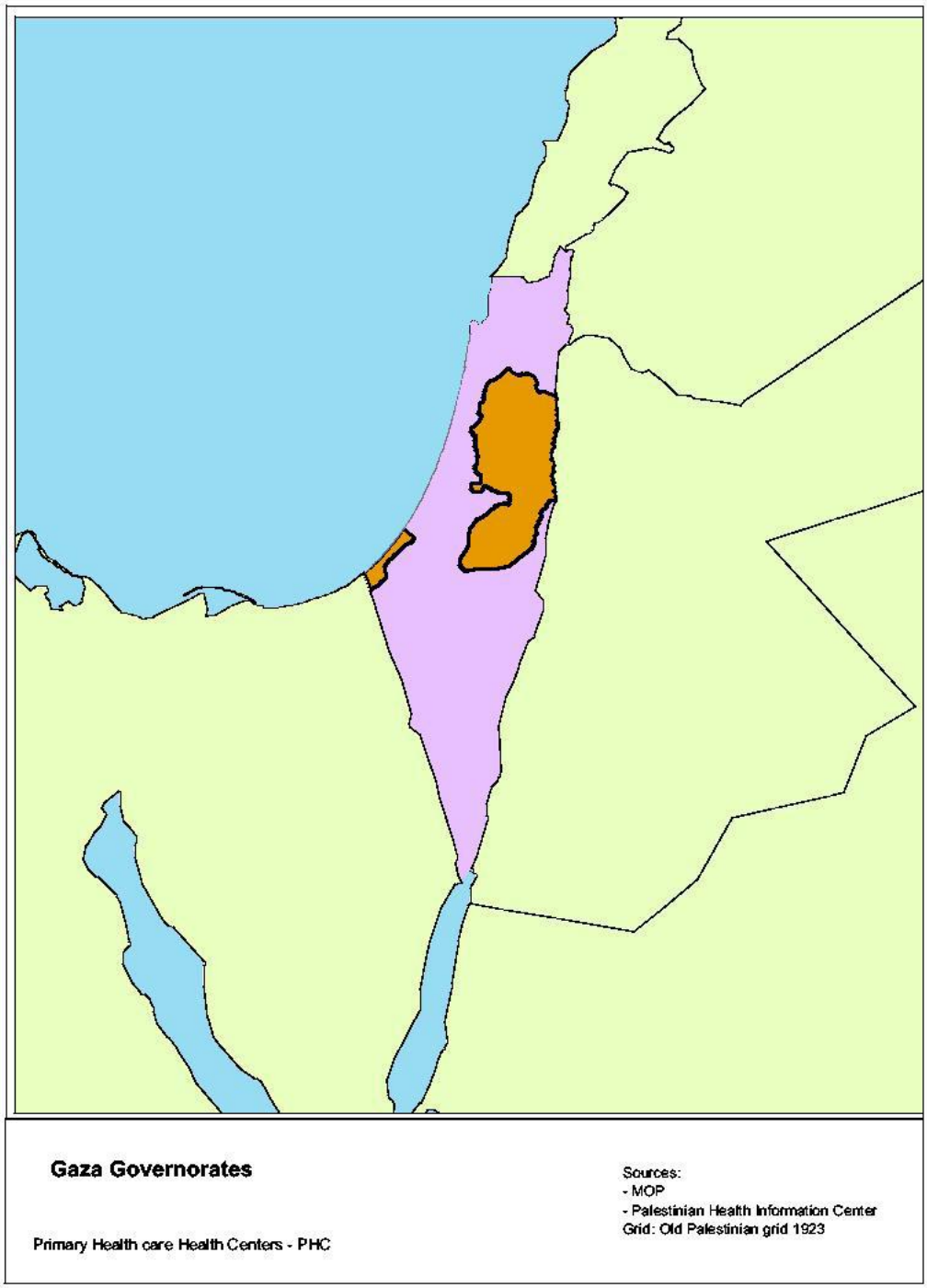
Annexes

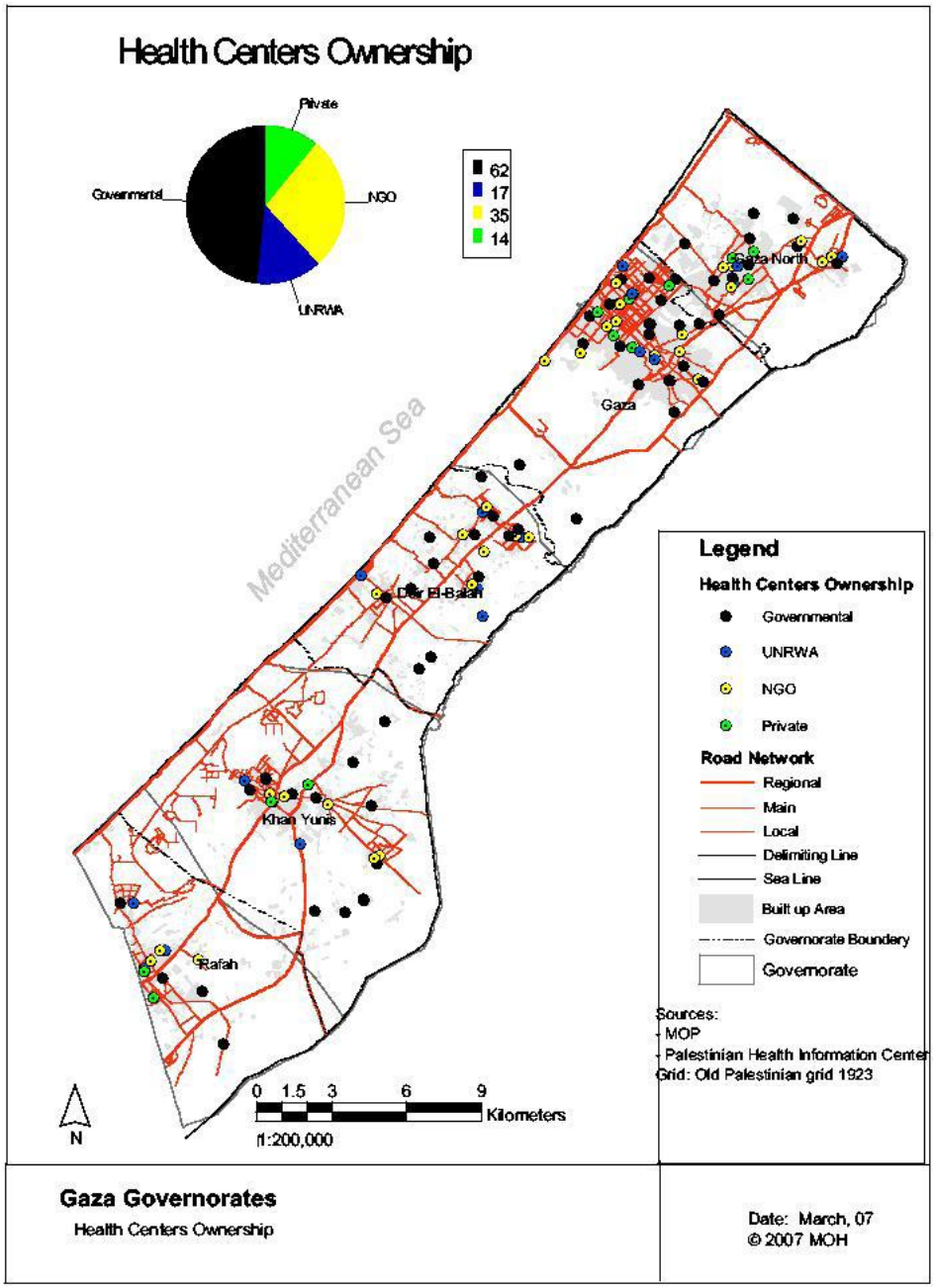
Annex (1)

Map of Palestine



Annex (2)

Map of Health Centers in Gaza Governorates



Annex (3)

Operation rooms in governmental hospitals- Gaza governorates (MOH,2008)

Hospital name	NO. of OR	NO. of operations
Shifa Medical Compound	14	8768
European Gaza hospital	5	7755
Nasser Medical Compound	6	5991
Abo Yousef Al Najar	2	927
Tall Al sultan	2	1884
Shohadaa Al Aqsa	3	1798
Kamal Odwan	2	2107
Bet Hanon	2	1311
ophthalmology hospital	2	2495

Annex (4): Helsinki committee approval

3

Palestinian National Authority
Ministry of Health
Helsinki Committee

السلطة الوطنية الفلسطينية
وزارة الصحة
لجنة هلسنكي

التاريخ 7/6/2010

Name:

الاسم: تيسير محمود السلطان

I would like to inform you that the committee has discussed your application about:

نفيدكم علماً بأن اللجنة قد ناقشت مقترح دراستكم حول:-

Utilization of the operating theaters in governmental hospitals in Gaza Governorates.

In its meeting on June 2010

and decided the Following:-

To approve the above mention research study.

و ذلك في جلستها المنعقدة لشهر 6 2010

و قد قررت ما يلي:-

الموافقة على البحث المذكور عاليه.

Ministry of the Interior Helsinki Committee

Signature

توقيع

Member

عضو

Member

عضو

Chairperson

Conditions:-

- Valid for 2 years from the date of approval to start.
- It is necessary to notify the committee in any change in the admitted study protocol.
- The committee appreciate receiving one copy of your final research when it is completed.

Annex (5): Agreement letter from MOH

السلطة الوطنية الفلسطينية
وزارة الصحة
الإدارة العامة لتنمية القوى البشرية

The Palestinian National Authority
Ministry of Health
Directorate General of Human Resources Development

الرقم ١٥/١٣٣٦
التاريخ: 2010/09/15م

الأخ الدكتور / محمد الكاشف المحترم،،،
مدير عام المستشفيات
تحية طيبة وبعد،،،

الموضوع/ إجراء بحث

بخصوص الموضوع أعلاه، يرجى تسهيل مهمة الطبيب/ تيسير محمود السلطان والذي يعمل بمستشفى كمال عدوان والملتحق ببرنامج ماجستير الصحة العامة مسار إدارة صحية – جامعة القدس لإجراء بحث بعنوان:-

"Utilization of the Operating theaters in Governmental Hospitals in Gaza Governorates "

حيث سيقوم الباحث بجمع معلومات من أقسام العمليات من مستشفى الشفاء الطبي ومستشفى غزة الأوروبي ومستشفى ش
الشهداء الاقصى بالإضافة إلى إجراء مقابلة مع الطواقم التي تعمل في هذه الأقسام، وذلك بما لا يتعارض مع مصلحة العمل وضمن ضوابط وأخلاقيات البحث العلمي،دون تحمل الوزارة أي أعباء، مع أخذ موافقة خطية من المشاركين بالبحث.

وتفضلوا بقبول خالص الاحترام والتقدير،،،،،،

د. ناصر رأفت أبو شعبان
مدير عام تنمية القوى البشرية

وزارة الصحة
تنمية القوى البشرية
صادر ١٥/١٣٣٦
التاريخ 18/9/19

صورة لـ/
- الملف

الإدارة العامة للمستشفيات
وارد
رقم: ١٠٩٥
تاريخ: 9.1.19

الإدارة العامة للمستشفيات
صادر
رقم: ٢٩٥
التاريخ: ٩/١/١٩

Tel / 08 2827208 Fax / 08 2868109 Email / gdhrd@moh.gov.ps

Annex (6): An official letter of request

Al-Quds University
Jerusalem
School of Public Health
2010/7/17

جامعة القدس
القدس
كلية الصحة العامة

الأخ/د. ناصر أبو شعبان المحترم
مدير عام تنمية القوى البشرية–وزارة الصحة
تحية طيبة وبعد،،،

الموضوع: مساعدة الطالب تيسير محمود السلطان

يقوم الطالب المذكور أعلاه بإجراء بحث بعنوان:

"Utilization of the Operating Theaters in Governmental Hospitals in Gaza Governorates"

كمتطلب للحصول على درجة الماجستير في الصحة العامة–مسار إدارة صحية و عليه نرجو التكرم للإيعاز لمن ترونه مناسب لتسهيل مهمة الطالب في جمع البيانات اللازمة من مستشفى الشفاء الطبي و مستشفى غزة الأوروبي و مستشفى شهداء الأقصى التابعين لوزارة الصحة.
علماً بأن المعلومات ستكون متوفرة لدى الباحث و الجامعة فقط.

و اقبلوا فائق التحية و الاحترام،،،

د. بسام أبو حمد
منسق عام برامج الصحة العامة

نسخة:
– الملف

Jerusalem Branch/Telefax 02-24799234
Gaza Branch/telefax 08-2884422-2884411
Sphealth@admin.alquds.edu
فرع القدس/تلفاكس 02-2799234
فرع غزة/تلفاكس 08-2884422-2884411
ص.ب/51000-القدس

Annex (7)

Questionnaire

First part: general information

Serial number:……

Name:……. Age…… Gender:…….

Hospital name:…….. Qualification:……. Experience:……..

Post: O Surgeon O Anesthesiologist O Nurse O Anesthesia technician

Second part: Pre-operative procedures

1- Does the anesthesiologist examine the patients one day prior to surgery?
   O Yes O Sometimes O No
2- Does the anesthesiologist note his remarks in the patient's medical record?
   O Yes O Sometimes O No
3- Does the surgeon note his remarks in the patient's medical record?
   O Yes O Sometimes O No
4- Does the surgical department nursing staff prepare the patient properly before surgery?
   O Yes O Sometimes O No
5- Does nursing staff note the remarks in the patient's medical record?
   O Yes O Sometimes O No
6- Are the necessary laboratory investigations, ECG and X-Rays done before surgery?
   O Yes O Sometimes O No O I don't know
7- Are the patients transferred from the surgical department to the operating rooms (O.Rs) by elevator?
   O Yes O Sometimes O No

8- Is there an additional elevator special for ORs.?

O Yes O No

9- If the elevator malfunctioning, it can be repaired as quickly as required?

O Yes O Sometimes O No

10- Is the nurse accompanied the patient while transferring him from the surgical department to the operating rooms?

O Yes O Sometimes O No

11- Is the way of communication -between the surgical department and ORs. to bring the patient for operation- done as quickly as required?

O Yes O Sometimes O No

12- Is the process of transferring the patient from the surgical department to the ORs. obtained as quickly as required?

O Yes O Sometimes O No

13- Is there a waiting area for patients in the operating suite before surgery?

O Yes O No

Third part: Intra-operative procedures

14- Are the surgeons arrive to the operating suite in the appropriate time(at eight o'clock am)?

O Yes O Sometimes O No

15- Are the anesthesiologists arrive to the operating suite in the appropriate time (at eight o'clock am)?

O Yes O Sometimes O No

16- Are the nursing staff arrive to the operating suite in the appropriate time(at half past seven am)?

O Yes O Sometimes O No

17- Does the number of surgeons within the ORs. appropriate with the number of operations?

O Yes O Sometimes O No

18- Does the number of anesthesiologists within the ORs. appropriate with the number of operations?

O Yes O Sometimes O No

19- Does the number of nursing staff within the ORs. appropriate with the number of operations?

O Yes O Sometimes O No

20- Does the surgeon waste time while doing other work within ORs.?

O Yes O Sometimes O No

21- Is there a harmony between the operating rooms staff(surgeons, anesthesiologists and nursing) and working as a team?

O Yes O Sometimes O No

22- Are there permanent workers within the ORs. to bring patients?

O Yes O No

23- Is the number of these workers within the operating rooms enough?

O Yes O No

24- Are there permanent cleaners within the operating rooms?

O Yes O No

25- Is the number of cleaners within the operating rooms enough?

O Yes O No

26- Is air conditioning within the ORs. Working properly?

O Yes O Sometimes O No

27- If there is malfunctioning in air conditioning within the ORs., can it be repaired as quickly as required?

O Yes O Sometimes O No

28- Are the tools and surgical instruments within the ORs. always enough for work?

O Yes O Sometimes O No

29- Are the quality of tools and surgical instruments within the ORs. correspond with the required specifications?

O Yes O Sometimes O No

30- Are surgical supplies always available in ORS.?

O Yes O Sometimes O No

31- Are anesthesia supplies always available in ORS.?

O Yes O Sometimes O No O I don't know

32- Are anesthesia drugs always available in ORS.?

O Yes O Sometimes O No O I don't know

33- Is the operating table functioning properly?

O Yes O Sometimes O No

34- Are the anesthesia machines functioning properly?

O Yes O Sometimes O No

35- Are the patient monitors in the operating rooms functioning properly?

O Yes O Sometimes O No

36- Is there regular maintenance for equipment in operating rooms?

O Yes O Sometimes O No O I don't know

37- Is the volume of work appropriate with the number of ORs?

O Yes O No

38- Is the staff movement in the ORs. smooth and easy to the required level?

O Yes O Sometimes O No

39- Is the emergency room in the ORs. ready at any time?

O Yes O Sometimes O No

40- Is there a protocol to accept the emergency cases in the ORs.?

O Yes O No

41- If the answer is yes, is there always commitment to that protocol?

O Yes O No

42- Is there a special form for counting the gauze within the ORs.?

O Yes O No

43- If the answer is yes, do you use this form in all cases while using this gauze?

O Yes O Sometimes O No

44- Are the staff in the ORs. had a commitment to wear operating rooms clothes?

O Yes O Sometimes O No

45- How long time does it take between the finishing of one operation and the introduction of another case(turnover time)?

O Less than 15 minutes O From 15-25 minutes O More than 15 minutes

Fourth part: Post- operative procedures

46- Is the recovery room equipped properly as required?

O Yes O No O I don't know

47- Is the number of beds in the recovery room appropriate with the number of operations?

O Yes O No

48- Are the patient's monitors in the recovery room functioning properly?

O Yes O Sometimes O No

49- Does the surgeon note his remarks after operation?

O Yes O Sometimes O No

50- Does the anesthesiologist note his remarks after operation?

O Yes O Sometimes O No

51- Does the nurse accompany the patient while transferring him from the operating rooms to the surgical department?

O Yes O Sometimes O No

Fifth part: administrative procedures

52- Is the routine operating list documented one day before operation?

O Yes O Sometimes O No

53- If the answer is yes, is it documented on the computer?

O Yes O Sometimes O No

54- Is there a medical secretary in the operating rooms?

O Yes O No

55- Is there a computerized system in the ORs. connected to other departments?

O Yes O No

56- Are the documents related to the patient in the ORs. complemented?

O Yes O Sometimes O No

57- Are there written protocols and guidelines, that regulate the work in the ORs.?

O Yes O No O I don't know

58- If the answer is yes, are these protocols and guidelines clear for all employees?

O Yes O No

59- Are the ORs. management able to solve everyday problems?

O Yes O No

60- Are the hospital administration responds to meet the demands of ORs.?

O Yes O Sometimes O No

61- Is there a waste of time in the operating rooms?

O Yes O Sometimes O No

62- If the answer is yes or sometimes, what are the most important three reasons for wasting time?

1-……

2-……

3-……

63- Do you think that the number of daily working hours of the routine operating list (6 hours) is:

O Appropriate with the number of operations O Not appropriate

64- If the answer is not appropriate, do you think that the number of daily hours should be:

O 8 hours O 10 hours O 12 hours

65-Is there postponement of some cases from the routine operating list?

O Yes O Sometimes O No

66- If the answer is yes or sometimes, do you think that the reason is due to:

O shortage of Staff in operating rooms.

O The patients are not prepared properly.

O The number of operation rooms are not appropriate with the number of operations.

O Lack of harmony between the staff in operating rooms (surgeons, anesthesiologists and nursing).

O Delay of transferring the patients from the surgical department to ORs.

O Daily working hours are not appropriate with the number of operations.

67- Upon your point of view…Do you think that the siege and the current political situation have a major role in:

O Lack of harmony between staff and occurrence of chaos in the ORs.

O Shortage and poor quality of equipments and supplies in the ORs.

O Shortage of staff in the ORs.

O Increase the number of patients in the operating list.

68- Write down the best three things that can lead to optimal use of ORs.

1-……

2-……

3-……

69- Write down the worst three things that can impede the work in the ORs.

1-……..

2-……..

3-……

Annex (8)

Records Review Checklist

Patient name:…… Number of file: ----------(code)

Name of hospital: ---------- date----------

Gender of client: ……..…… Age ……

Type of surgery performed: ……

Admission method: **a. Emergency** **b. Outpatient**

Please check the availability and completeness of the following records in the discharged patients

Sheet (pre-operative checklist)	**Available**		**Completed**		**Notes**
	Yes	**No**	**Yes**	**No**	
General data sheet					
Admission sheet					
History& Physical examination sheet					
Referral sheet					
Operation Consent Form					
Lab Investigations results (if requested)					
C.B.C					

Urea and creatinine					
Liver function test					
Hepatitis B(Austria Antigen)					
Serum electrolytes Blood sugar					
X-rays (if requested)					
ECG (if requested)					
Vital signs sheet					
Post-operative checklist					
Nursing notes					
Follow up sheet					
Operative notes					
Anesthesia sheet					
Post operative analgesia					
Recovery sheet					
Consultation note					
Discharge sheet (DS)					
Treatment recorded in DS					
Recommendations					
Appointment for follow up DS					

Check the availability of name and signature of the following in the provided sites (all should be available)					
Name of provider-Doctor					
Signature of provider-Doctor					
Name of provider-Nurse					
Signature of provider-Nurse					
Name of anesthetist					
Signature of anesthetist					

Name of data collector ---------- Signature ----------

Date……

Annex (9)

In-depth interview with OR. Managers in governmental hospitals.

Introduction

research and its purpose

1. How do you describe the work processes within and among operation rooms?

2. How do you perceive the effectiveness of work processes ?

3. Which are the common problems and challenges you are facing in :
   - Admission
   - Pre-op. care
   - Intra operative (in the theater)
   - Post op. care
   - Documentation

4. What are the barriers of implementing standardized care in operation rooms?

5. Do you think that the staff satisfaction and dissatisfaction affect the improvement of care quality ?

6. How you describe the documentation in operation rooms and what are the main gaps in this aspect ?

7. Are you satisfied about work process ? (admission , pre op. intra op. and post op. care).

8. Do you think that client receive appropriate care ?

9. What's strategies do you proposed to improve the quality of care in operation rooms?

10. Do you think that such researches will help in improving health services ?

Annex (10)

Arabic questionnaire

استبيان

بسم الله الرحمن الرحيم

جامعة القدس

كلية الصحة العامة

برنامج ماجستير الصحة العامة– إدارة صحية

زميلاتي، زملائي الأعزاء :

تحية وتقدير،،،

الاستبانة التي بين يديكم هي إحدى أدوات الدراسة لاستكمال متطلبات درجة الماجستير في الصحة العامة– إدارة صحية في كلية الصحة العامة بجامعة القدس بعنوان**:**

" Utilization of the operating theaters in governmental hospitals in Gaza Governorates"

إن تعاونكم معنا هو دعم للبحث العلمي في فلسطين, مع العلم إن المعلومات التي سيتم الحصول عليها سوف يتم التعامل معها بسرية تامة و لن تستخدم إلا لأغراض البحث العلمي, آملا أن تحظى هذه الدراسة بعنايتكم و اهتمامكم.

مع خالص الشكر والتقدير لتعاونكم

الباحث

تيسير السلطان
0599411082

القسم الأول: معلومات عامة

الرقم المسلسل:.....

الاسم (اختياري):..... العمر:..... الجنس:.....

اسم المستشفى:..... المؤهل العلمي:..... سنوات الخبرة:.....

الفئة الوظيفية: O جراح O طبيب تخدير O تمريض O فني تخدير

القسم الثاني: إجراءات ما قبل العملية

1. هل تتم معاينة المريض من قبل طبيب التخدير قبل العملية بيوم؟
   O نعم O أحيانا O لا
2. هل يقوم طبيب التخدير بتدوين ملاحظاته في تذكرة المريض؟
   O نعم O أحيانا O لا
3. هل يقوم الجراح بتدوين ملاحظاته في تذكرة المريض قيل العملية؟
   O نعم O أحيانا O لا
4. هل يقوم تمريض القسم بتحضير المريض بالشكل المطلوب قبل ألعملية؟
   O نعم O أحيانا O لا
5. هل يقوم التمريض بتدوين ملاحظاته في تذكرة المريض قيل العملية؟
   O نعم O أحيانا O لا
6. هل يتم عمل ما يلزم من تحاليل، رسم قلب و صور أشعة قبل العملية؟
   O نعم O أحيانا O لا O لا اعرف
7. هل يتم نقل المريض من القسم إلى العمليات بواسطة المصعد؟
   O نعم O أحيانا O لا
8. هل يوجد مصعد إضافي خاص بقسم العمليات؟
   O نعم O لا
9. في حال حصل عطل للمصعد، هل يتم إصلاحه بالسرعة المطلوبة؟
   O نعم O أحيانا O لا
10. هل يرافق المريض ممرض أثناء نقله من القسم إلى قسم العمليات؟
    O نعم O أحيانا O لا

11. هل طريقة الاتصال بين القسم والعمليات لطلب إحضار المريض للعمليات تتم بالسرعة المطلوبة؟

O نعم O أحيانا O لا

12. هل تتم عملية نقل المريض من القسم إلى العمليات بالسرعة المطلوبة ؟

O نعم O أحيانا O لا

13. هل يوجد مكان انتظار للمريض في قسم العمليات قبل العملية؟

O نعم O لا

القسم الثالث: إجراءات داخل غرف العمليات

14. هل يتواجد الجراحين في غرف العمليات في الوقت المناسب(الساعة الثامنة صباحا)؟

O نعم O أحيانا O لا

15. هل يتواجد أطباء التخدير في غرف العمليات في الوقت المناسب (الساعة الثامنة صباحا)؟

O نعم O أحيانا O لا

16. هل يتواجد التمريض في غرف العمليات في الوقت المناسب(الساعة السابعة و نصف صباحا)؟

O نعم O أحيانا O لا

17. هل عدد طاقم الجراحين داخل غرف العمليات يتناسب مع حجم العمليات؟

O نعم O أحيانا O لا

18. هل عدد طاقم التخدير داخل غرف العمليات يتناسب مع حجم العمليات؟

O نعم O أحيانا O لا

19. هل عدد طاقم التمريض داخل غرف العمليات يتناسب مع حجم العمليات؟

O نعم O أحيانا O لا

20. هل يقوم الجراح بهدر الوقت لقيامه بأعمال أخرى داخل قسم العمليات؟

O نعم O أحيانا O لا

21. هل يوجد انسجام بين طاقم العمليات (جراحين، تخدير و تمريض) و يعملون كفريق عمل؟

O نعم O أحيانا O لا

22. هل يوجد مراسلين بشكل دائم داخل قسم العمليات لإحضار المرضى؟

O نعم O لا

23. هل عدد المراسلين داخل قسم العمليات كافي؟

O نعم O لا

24. هل يوجد عمال نظافة بشكل دائم في غرف العمليات؟

O نعم O لا

25. هل عدد عمال النظافة داخل قسم العمليات كافي؟

O نعم O لا

26. هل التكييف داخل غرف العمليات يعمل بالشكل المطلوب؟

O نعم O أحيانا O لا

27. في حال حصل عطل للمكيف هل يتم إصلاحه بالسرعة المطلوبة؟

O نعم O أحيانا O لا

28. هل الأدوات والآلات الجراحية الموجودة في العمليات تكفي للعمل بشكل دائم ؟

O نعم O أحيانا O لا

29. هل نوعية الأدوات والآلات الجراحية الموجودة في العمليات تكون حسب المواصفات المطلوبة؟

O نعم O أحيانا O لا

30. هل المستلزمات الجراحية متوفرة بشكل دائم؟

O نعم O أحيانا O لا

31. هل مستلزمات التخدير متوفرة بشكل دائم؟

O نعم O أحيانا O لا O لا اعرف

32. هل أدوية التخدير متوفرة بشكل دائم؟

O نعم O أحيانا O لا O لا اعرف

33. هل طاولة العمليات في غرف العمليات تعمل بالشكل المطلوب؟

O نعم O أحيانا O لا

34. هل أجهزة التخدير في غرف العمليات تعمل بالشكل المطلوب؟

O نعم O أحيانا O لا

35. هل أجهزة مراقبة المريض في غرف العمليات تعمل بالشكل المطلوب؟

O نعم O أحيانا O لا

36. هل يوجد صيانة دورية لأجهزة العمليات؟

O نعم O لا O لا اعرف

37. هل حجم العمل يتناسب مع عدد غرف العمليات الموجودة ؟

O نعم O لا

38. هل حركة الموظفين في قسم العمليات سلسلة وطبيعية للمستوى المطلوب؟

O نعم O أحيانا O لا

39. هل غرفة الطوارئ للعمليات على جاهزية تامة في أي وقت؟

O نعم O أحيانا O لا

40. هل يوجد خطة أو طريقة لقبول المريض في الحالات الطارئة للعمليات ؟

O نعم O لا

41. إذا كان الجواب نعم هل يتم الالتزام بالخطة بشكل دائم؟

O نعم O لا

42. هل يوجد نموذج خاص لعد الشاش في غرف العمليات؟

O نعم O لا

43. إذا كان الجواب نعم هل يتم استخدام هذا النموذج في جميع الحالات التي يستعمل فيها الشاش؟

O نعم O أحيانا O لا

44. هل يلتزم العاملين بلباس العمليات داخل غرف العمليات؟

O نعم O أحيانا O لا

45. كم من الوقت يستغرق بين الانتهاء من العملية و إدخال عملية أخرى؟

O اقل من 15 دقيقة O من 15–25 دقيقة O أكثر من 25 دقيقة

القسم الرابع: إجراءات ما بعد العملية

46. هل الأسرة في غرفة الإفاقة مجهزة بالشكل المطلوب ؟

O نعم O لا O لا اعرف

47. هل عدد الأسرة في غرفة الإفاقة يتناسب مع حجم العمليات؟

O نعم O لا

48. هل أجهزة المراقبة في غرفة الإفاقة تعمل بالشكل المطلوب؟

O نعم O أحيانا O لا

49. هل يقوم الجراح بتدوين ملاحظاته بعد العملية؟

O نعم O أحيانا O لا

50. هل يقوم طبيب التخدير بتدوين ملاحظاته بعد العملية؟

O نعم O أحيانا O لا

51. هل يرافق المريض ممرض أثناء نقله من العمليات إلى القسم؟

O نعم O أحيانا O لا

القسم الخامس: إجراءات إدارية

52. هل يتم توثيق قائمة العمليات الروتينية قبل العمليات بيوم ؟

O نعم O أحيانا O لا

53. إذا كان الجواب نعم هل يتم توثيقها على الحاسوب؟

O نعم O أحيانا O لا

54. هل يوجد سكرتارية طبية في قسم العمليات؟

O نعم O لا

55. هل يوجد نظام محوسب في العمليات يتصل بباقي الأقسام ؟

O نعم O لا

56. هل يتم استكمال جميع الوثائق المتعلقة بالمريض في العمليات؟

O نعم O أحيانا O لا

57. هل هناك بروتوكولات مكتوبة لتنظيم العمل في قسم العمليات؟

O نعم O لا O لا اعرف

58. إذا كان الجواب نعم هل هذه البروتوكولات واضحة لجميع العاملين؟

O نعم O لا

59. هل إدارة العمليات قادرة على حل المشاكل اليومية؟

O نعم O لا

60. هل تستجيب إدارة المستشفى لتلبية طلبات إدارة قسم العمليات؟

O نعم O أحيانا O لا

61. هل يوجد هدر للوقت المخصص للعمليات ؟

O نعم O أحيانا O لا

62. إذا كان الجواب نعم أو أحيانا حسب اعتقادك ما هي أهم ثلاثة أسباب لهدر الوقت؟

1. .....

2. .....

3. .....

63. هل تعتقد عدد ساعات العمل اليومية في غرف العمليات لقائمة العمليات الروتينية(6 ساعات):

O يتناسب مع حجم العمليات O لا يتناسب مع حجم العمليات

64. إذا كان الجواب لا يتناسب... باعتقادك أن عدد الساعات اليومية يجب أن تكون:

O 8 ساعات O 10 ساعات O 12 ساعة

65. هل يتم تأجيل بعض الحالات من قائمة العمليات الروتينية؟

O نعم باستمرار O أحيانا O لا

66. إذا كان الجواب نعم أو أحيانا، هل تعتقد أن السبب يرجع إلى:

O نقص في عدد طاقم العمليات.

O عدم تحضير المريض بشكل مناسب.

O عدد غرف العمليات لا يتناسب مع عدد العمليات.

O عدم وجود انسجام بين طاقم العمليات(جراحين،تخدير،تمريض).

O تأخير في نقل المريض من القسم إلى قسم العمليات.

O عدد ساعات العمل اليومية لا تتناسب مع عدد العمليات.

67. حسب وجهة نظرك... هل تعتقد أن ظرف الحصار و الوضع السياسي الحالي لهما دور كبير في :

O عدم وجود انسجام بين العاملين و حدوث فوضى داخل قسم العمليات.

O نقص و تدني جودة الأجهزة والأدوات الجراحية في غرف العمليات.

O نقص عدد العاملين في غرف العمليات.

O زيادة عدد المرضى على قائمة العمليات .

68. اذكر أفضل ثلاثة أشياء ممكن أن تؤدي إلى الاستخدام الأمثل لغرف العمليات.

1. .....

2. .....

3. .....

69.اذكر أسوا ثلاثة أشياء يمكن أن تؤدى إلى إعاقة العمل في غرف العمليات. .

1. .....

2. .....

3. .....

Annex(11)

Request for evaluation and controlling questionnaire

استمارة تحكيم

السيد / د.....المحترم

تحية طيبة وبعد:

الموضوع تحكيم استبانة

يقوم الباحث بإجراء دراسة ميدانية بعنوان:

" Utilization of the operating theaters in governmental hospitals in Gaza Governorates"

و ذلك لاستيفاء متطلبات الحصول على درجة الماجستير في الصحة العامة- إدارة صحية في كلية الصحة العامة بجامعة القدس.

إن خبرتكم الطويلة في هذا المجال و ثقة الباحث بكم جعلته يضع الاستبانة المرفقة بين أيديكم لأجل الوقوف على صحة ودقة فقراتها و كذلك مدى صلاحيتها و ملائمتها للبيئة الفلسطينية التي أعدت من اجلها و يتطلع الباحث إلى ملاحظاتكم وآرائكم القيمة التي ستكون ذات تأثير كبير في إخراج الاستبانة بشكل يتسم بالمنهجية وتحقيق الأهداف المرجوة منها، و ذلك بإجراء تعديلات أو إضافات أو ملاحظات ترونها مناسبة و تثري هذه الاستبانة.

مرفق أهداف البحث.

شاكرين لكم حسن تعاونكم

و تفضلوا بقبول فائق الاحترام و التقدير

الباحث

تيسير السلطان

Annex (12)

Names of experts

1. Dr. Bassam Abo Hamad	Al- Quds University
2. Dr. Yehia Abed	Al- Quds University
3. Dr. Mofed Mokhalalaty	Islamic University
4. Dr. Spero Altawil	MOH, Head of surgical department
5. Dr. Tayser Younis	MOH, Head of anesthesia department
6. Dr. Mohammed Elron	MOH, Head of surgical department
7. Dr. Abdel Latif Alhaj	MOH, Head of surgical department
8. Dr. Marwan Abo Sada	MOH, Head of surgical department
9. Dr. Raed Tbeil	MOH, Head of surgical department
10. Mr. Hany Hamada	MOH, Nursing manager

ملخص الدراسة

ألاستخدام الأمثل لغرف العمليات في مستشفيات وزارة الصحة بمحافظات غزة.
ألاستخدام الأمثل لغرف العمليات يعتبر هدف رئيسي لمعظم مدراء العمليات بشكل خاص و مدراء المستشفيات بشكل عام. إن تقييم ألإجراءات المعمول بها في غرف العمليات يعتبر خطوة أولى في تقييم جودة و كفاءة هذه الغرف.

ألهدف من هذه الدراسة هو تقييم استخدام غرف العمليات والوقت المستخدم في هذه الغرف في مستشفيات وزارة الصحة بمحافظات غزة و ذلك من اجل تحسين جودة العمل فيها.
حيث أجريت هذه الدراسة الكمية، الكيفية، المقطعية من اجل تقييم خطوات العمل في غرف العمليات. تم جمع المعلومات باستخدام استبانة يعبئها الموظف و مراجعة ملفات المرضى، بالإضافة إلى إجراء مقابلات شخصية مع مدراء العمليات. شملت الدراسة جميع الأطباء، الممرضين و فنيي التخدير الذين يعملون في مجمع الشفاء الطبي، مستشفى غزة الأوروبي و مستشفى شهداء الأقصى (220)، مع معدل استجابة 95 %، أيضا تم مراجعة 100 ملف مريض للتأكد من وجود و تعبئة الأوراق المطلوبة فيها و كذلك تم مقابلة 9 مدراء لغرف العمليات في المستشفيات المختارة. تم جمع البيانات بواسطة الباحث نفسه. تم استخدام البرنامج الإحصائي SPSS لتحليل المعلومات. و للتأكد من مدى ثبات العناصر المستخدمة في الدراسة تم إجراء اختبار الثبات، فكانت نتيجة اختبار كرونباخ ألفا 0.8954 .

وقد أظهرت نتيجة الدراسة أن معظم الإجراءات المعمولة من قبل الأطباء (جراحيين و تخدير)، قبل العملية تعمل بشكل صحيح و لكن هذه الإجراءات لا تعمل دائما بشكل صحيح من قبل تمريض قسم الجراحة. و أظهرت نتائج الدراسة أيضا أن معظم الأوراق المطلوبة موجودة و مكتملة في ملفات المرضى باستثناء بعض الأوراق المهمة مثل: ورقة التخدير و ورقة الإفاقة حيث أن 80 % من هذه الأوراق غير موجودة، و كذلك عدم وجود ورقة التاريخ المرضي و فحص المريض حيث أن 74 % من هذه الأوراق غير موجودة. أظهرت النتائج عدم وجود بروتوكولات ومعايير تنظيم العمل في غرف العمليات و حتى إن وجدت فهي غير واضحة لجميع العاملين. بالإضافة إلى عدم وجود وصف وظيفي للعاملين مما يؤدى إلى تكرار النزاعات بين العاملين و أيضا غياب نظام الثواب والعقاب. وكذلك بينت النتائج أن عدد غرف العمليات لا يتناسب مع حجم العمل، بالإضافة إلى أن عدد ساعات العمل للقائمة الروتينية في هذه الغرف لا

يتناسب مع عدد العمليات المبرمجة والتي اعتبرت حسب نتائج هذه الدراسة من أهم الأسباب التي تؤدي إلى تأجيل بعض الحالات من قائمة العمليات اليومية و هذا بدوره يزيد عدد المرضى في قائمة الانتظار.

يوصي الباحث بعمل بروتوكولات ومعايير للإجراءات المعمول بها في غرف العمليات من اجل تطوير جودة العمل في هذه الغرف و أن تكون مكتوبة و واضحة لجميع العاملين. و أيضا عمل وصف وظيفي للعاملين و كذلك اعتماد نظام الثواب والعقاب. كما و يوصي بالعمل على زيادة ساعات العمل للقائمة الروتينية في غرف العمليات.