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Surgeon Practices and Attitudes toward the Control of Surgical-Site Infections in Jordan

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Surgeon Practices and Attitudes toward the Control of Surgical-Site Infections in Jordan

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Abstract

The purpose of this study was to determine the attitudes and practices of Jordanian surgeons on the control of surgical-site infections, evaluated by the Center of Disease Control's guidelines toward the prevention of surgical-site infections, in addition to gaining respondents opinions on infection control in Jordan. This study was conducted through the distribution of 75 questionnaires given to surgeons at five hospitals in Jordan. Additional insight on SSI infection control was gained through interviews with two cardiac surgeons and three infection control directors. The results of the survey were compared with the Center for Disease Control's guide to surgical-site infection to determine surgeon compliance with international recommended guidelines in patient antiseptic bathing, setting and method of patient hair removal, and use of antibiotic prophylaxis, in addition to measuring respondents' views toward their own compliance of preoperative, intraoperative, and postoperative infection control protocol. Of the 75 surveys distributed, 57 were returned indicating a 76% response rate. Survey results suggest that a significant portion of surgeons surveyed were not in compliance with CDC recommended guidelines, with only 47.4% recommending preoperative bathing, 29.8% of surgeons removing patient hair in the operating room, only 57.1% using clippers as a means to removing patient hair prior to surgery, and 12.3% not using antibiotic prophylaxis regularly. Yet, when surgeons were questioned as to how well they follow preoperative, intraoperative, and postoperative infection control protocol, 61.4%, 73.7%, and 72% respectively rated their adherence to these guidelines as "excellent" or "very good". These results suggest the need for more education toward the prevention of surgical-site infections toward attending surgeons and surgical residents in addition to more effective surveillance of infection control programs at hospitals.

Keywords: Medicine and Surgery, Health Care Management, Occupational Health and Safety, Public Health

Introduction

Hospital-acquired infections (HAIs), also known as nosocomial infections, are infections acquired in a hospital by a patient whose reason for admission was not for the acquired infection. Nosocomial infections are a serious issue affecting both the developed and the developing countries and are one of the leading causes of death in the world (Ducel, Fabry, & Nicolle, 2002). HAIs are a significant burden to hospitals, leading to prolonged hospital stays, increased rates of hospital bed occupants, and additional costs to the health care systems, with nearly 1.4 million individuals suffering from these infections at any moment.

The most common nosocomial infections are urinary tract infections, surgical site-infections (SSIs), and lower respiratory tract infections. However, of these, surgical site-infections top the list of hospital-acquired infections. There are various factors that can influence the development of SSIs including duration of operation, preoperative cleansing and shaving methods, the healthcare setting environment, and mostly importantly, the judgment and proper technique of the surgeon and surgical team (Nichols, 2004). Therefore, it is not surprising that many SSIs result from the noncompliance of healthcare professionals with regards to correct hygienic and infection control guidelines.

Interest in the subject of infection control and surgical-site infections has increased dramatically over the past 60 years. In fact, the appointment of the first infection control program was in the United Kingdom in the 1950s and during the same period in the United States, the infection control nurse was introduced. By the mid-1970s, many studies concerning the nature of human bacteria in health and the important effect of anaerobic bacteria on postoperative surgical-site infection were presented (Nichols 2004). These advances in knowledge eventually led to enhanced uses of antibiotic prophylaxis in the early 1980s. During the same period, more

attention was given to the procedure-specific risk factors for the development of SSIs. In fact, the Surgical Infection Society was established in 1980 for scientists, surgeons, and physicians to cooperate efforts in research and education regarding patients suffering from SSIs. By 1999, the Center for Disease Control published revised guidelines for the prevention of surgical-site infections based on the operative factors concerning these infections (Nichols, 2004).

The practice of infection prevention and control has emerged into an internationally recognized health care discipline. Worldwide, there has been steady growth and expansion of the discipline and practice of infection control. However, in the Arab region, infection control programs are limited and surveillance programs are nearly nonexistent. According to the WHO guide to the prevention of HAIs, the Eastern Mediterranean region has one of the highest rates of nosocomial infections in the world, with an infection rate of 11.8% (Ducel et al., 2002). Despite the high prevalence of HAIs, many Arab countries have not taken initiatives to start nation-wide infection control programs and strengthening surveillance to assess the burden of hospital infections. These high rates in the Middle East can be attributed to a number of factors including poor infection control guidelines as a result of inadequate education of health care workers, as well as ignorance of existing infection control protocol and poor physician training.

Of course, the most effective method for controlling SSIs and HAIs in general is implementing quality control measure and evidence-based management. In Jordan, there is no governing body that surveillances hospital protocols guidelines and there are no standardized clinical practice guidelines in the country. In 2007, the Health Care Accreditation Council was established to promote quality improvement in healthcare settings through accreditation by establishing national health care standards for health facilities. While this is an important

milestone, accreditation is not mandatory for hospitals in Jordan as only 17 hospitals are accredited in the country.

No information on Jordanian surgeon practices on the control of surgical-site infection has ever been published. This study aims to determine the practices of surgeons toward the control of surgical-site infections evaluated by the CDC's guidelines to surgical-site infections, in addition to measuring the surgeon attitudes toward their compliance with pre-operative, intra-operative, and post-operative infection control guidelines.

The researcher wrote a survey based on the CDC's Guidelines for the Prevention of Surgical-Site Infections. The questionnaire assessed surgeon's practices toward certain pre-operative, intra-operative, and post-operative guidelines that were strongly recommended by the CDC as well as surgeon opinions toward infection control in their respective facilities. In addition, interview with surgeons and infection control directors were also done in order to gain more insight towards the scope of infection control practices. This subject is pertinent as it provides insight towards the rates of HAIs specifically concerning SSIs. From this, identification of compliance weakness can be identified, providing further information for improvements towards surgeon education on surgical-site infection control. From the literature reviewed, it is hypothesized that compliance of surgeon practices with recommended guidelines can be improved.

Literature Review

Jordanian surgeon practices and attitudes towards the prevention of surgical-site infections can be viewed in the context of hospital infection control practices in the Middle East. Although there has been no published information toward surgeon's practices toward the prevention of surgical-site infections in Jordan, there are various studies that outline practices and attitudes of healthcare personnel toward infection control in addition to SSI cases both in the Middle East and abroad.

In 2008, a study conducted in Canada surveyed 589 surgeons about the prevention of surgical site infections and compared their practices toward evidence-based guidelines (Davis, Spady, Gara, & Forgie, 2008). The survey found that of the 247 who had responded, 63% of surgeons were not in compliance with various CDC guideline recommendations that included preoperative bathing, hair removal, antimicrobial prophylaxis or intraoperative skin preparation. This is one of the first of its kind conducted in North America regarding surgeon practices and compliance. This study will be beneficial in outlining the methodology used and comparing results in this respective study.

A similar study was also conducted in University of Toronto in 2012 where general surgeons and residents were given a survey pertaining to SSI prevention and knowledge of prevention strategies and barriers for SSI prevention implementation (Eskicioglu et al., 2012). Results of the study revealed that more awareness and implementation that engage both residents and attending surgeons are necessary to improve practices. This research shows the gap between evidence and practice, as well as the need for improved compliance to guidelines. In addition, this study also highlights that implementation and awareness of SSI prevention is a worldwide issue that not only affects the MENA region.

Various studies regarding SSI infections in the Middle East have also been conducted. A study conducted in Alexandria Hospital in Egypt surveyed the rate of SSI infections among 187 patients after cardiothoracic and urologic surgeries (Hafez et al., 2011). SSI rate among cardiothoracic surgeries was 23.3% and 9% with urologic surgeries. By emphasizing the need for measures to reduce the high rates of SSI in the MENA through a multidisciplinary effort including infection control education and specific SSI prevention activities, much useful information can be gained from this research.

A similar study analyzing the overall surgical-site infection rate was also conducted in an Egyptian university hospital, where the overall SSI rate was found to be much higher than those reported in the literature (22.6%) (Afifi, Labah, & Ayad, 2009). The study also found that duration of operation, preoperative shaving and expertise of the surgeon were significantly associated with the occurrence of SSIs. These parameters can be valuable for the measures taken in this respective study in Jordan.

In Iran, a study determining the knowledge, attitudes and practices of surgeons regarding standard precautions was assessed using a questionnaire (Askarian, McLaws, & Meylan, 2007). Of the 250 questionnaires distributed, 155 were returned. Although the study was limited by its reliance on self-reporting rather than by observing compliance, the study showed that more than 80% of all medical practitioners had not received previous education for standard precautions. This indicates the need for the revision of current medical curricula offered in Iran to medical students and for hospital trainees to attend infection control courses. It is expected that similar findings in regards to the needs for education will be seen in the study in context. In addition, the methodology of self-reporting will also be used.

Although no information regarding surgeon practices and surgical-site infection control are present in Jordan, a 2013 study surveyed Jordanian nurses' compliance to infection control guidelines (Al-Rawajfah et al., 2013). The results showed that 65% demonstrated high compliance whereas 32% demonstrated weak compliance with infection control. In addition, nurses working at university affiliated hospitals showed higher compliances than other types of hospitals. Although this information does not pertain to the focus group of surgeons, this information is important as the entire operating room team includes other healthcare staff such as nurses and operating room technicians. By gaining information towards the practices and attitudes of multiple surgical team members, insight towards infection control practices can be gained, as the rates of SSIs are not determined by surgeon practices alone.

According to Jabbour, all basic elements of infection control need to be strengthened in the MENA region which includes establishment of standard precautions and HAI surveillance programs (2012). Unfortunately, the implementation of effective infection control programs faces many challenges in the Middle East, especially in the public sector where deficiency in the quality of health care and its delivery are due to insufficient budgets and leadership. It is also known that HAIs that include SSIs are often found in crowded and poorly staffed public hospitals that cater to socially disadvantaged populations. Jabbour also cites the needs to improve surveillance capacity, increase training for health staff personnel and support infection control programs. This information can prove beneficial in analyzing the resulting data of this study.

Methodology

The purpose of this study was to determine the attitudes and practices of surgeons toward the control of surgical-site infections evaluated by the CDC's guidelines to surgical-site infections, in addition to collecting the opinions of surgeons and infection control directors toward the infection control management in hospital settings in Jordan.

Instrumentation of Method 1

A cross-sectional survey was prepared by the researcher and reviewed by the researcher's academic advisor and revised. The surveys were then reviewed by Jordan's International Review Board (IRB) and Local Review Board (LRB) and approved with minimal recommendations. Surveys were given to surgeon and surgical residents at five hospitals in total: three public hospitals, one military hospital, and one private hospital in Jordan. The questionnaire was pre-tested on a random sample of participants to ensure validity and interpretation of responses and amended as necessary.

The survey was comprised of 16 close-ended questions and one short-answer question (see Appendix I) with the type of hospital the surgeon worked, specialty, and years of practice outlined in the survey. The researcher developed the close-ended questions based on the Center for Disease Control's guidelines for the prevention of surgical-site infections. The CDC guidelines contained an evaluation process to assess surgeon practices. The guidelines are broken down according to rankings: category IA, category IB, and category II. Category IA are strongly recommended infection control guidelines for implementation and supported by well-designed experimental and clinical studies. Category IB are also strongly recommended guidelines and are supported by some experimental and clinical studies. Category II are suggested infection control recommendations for implementation and are supported by suggestive clinical studies.

For this experiment, antiseptic bathing, method and place of patient hair removal, use and duration of antibiotic prophylaxis, and the encouragement of smoking cessation were analyzed in the survey, all of which pertained to categories IA and IB of the CDC guidelines.

In addition, three questions were used to assess surgeons' attitudes toward how well they rate their adherence to pre-operative, intra-operative, and post-operative infection control protocol using a five-point poor through excellent Likert scale. One short-answer question was designed to provide participants to add insight towards infection control management.

Due to the nature of the questions and CDC guidelines toward the prevention of surgical-site infections, it was deemed reasonable to survey surgeons of various specialties since the protocols selected are standard and applicable to all surgeon specialties. Surveys were given to surgeons and surgical residents at 4 hospitals in Amman and 1 hospital in Irbid. Verbal consent for the surveys was obtained from the participants, as participation was voluntary. Permission from the director of surgical departments was obtained and subsequently surveys were distributed to surgeons and surgical residents of the respective departments and collected immediately. Quantitative data was recorded on a spreadsheet for analysis and descriptive statistics were considered.

Instrumentation of Method 2

The second method of collecting data was conducted through semi-structured interviews with two cardiac surgeons working in the public sector and three hospital infection control directors in Amman, Jordan, two in the private and one in the public sector. The purpose of the semi-structured interviews was to allow the interviewee to expand upon their answers that may give beneficial data to the research being conducted. These professionals were found through the researcher's advisor. These individuals were contacted and consented to an interview or had

referred to other professionals that were known to be beneficial to the research. These health care professionals were sought for their experience in the first-hand experience hospital infection control. All interviewees signed a written informed consent form before the beginning of the interview. In addition, background information regarding the research topic was given to each interviewee while preserving anonymity and confidentiality of the interview participants. All interviews were conducted within the professional's place of work and interview times ranged from 15 to 30 minutes. Qualitative data derived from the interviews were coded by keywords pertinent to the researcher's topic of interest.

Findings

Surveys

Surveys were given to surgeons and surgical residents to measure their respective infection control practices based on the criteria described. The survey distribution was at the discretion of the surgical director of the respective department. In total, seventy-five surveys were distributed at five hospitals. Of the seventy-five distributed, fifty-seven surveys were received completed, indicating a response rate of 76%. Of the completed surveys, 24.6% were completed by surgeons practicing in the private sector, 42.1% were completed by public hospital surgeons, and 19% were completed by surgeons working in the military hospital sector. Of the surgeons surveyed, 40.4% were cardiothoracic surgeons, 29.8% were general surgeons, 12.3% were orthopedic and the remaining comprised of plastic, gynecologic, urology and neurosurgeons.

When surgeons were asked about whether they recommend to the patients preoperative bathing with an antiseptic, 52.6% of respondents stated that they do not recommend preoperative antiseptic bathing. When analyzing the differences between cardiothoracic, general, and orthopedic surgeons, cardiothoracic surgeons were significantly more likely to recommend preoperative bathing to their patients (91.3%) whereas only 28.6% of orthopedic surgeons and 11.8% of general surgeons recommended this guideline ($p < .0001$).

When asked about whether preoperative patient hair removal was done in the operating room, only 29.8% of surgeons stated that preoperative patient hair removal was done within the operating room. When comparing the three main groups of surgeons, there was also a significant difference in the responses. 100% of orthopedics surveyed stated that patient hair removal was

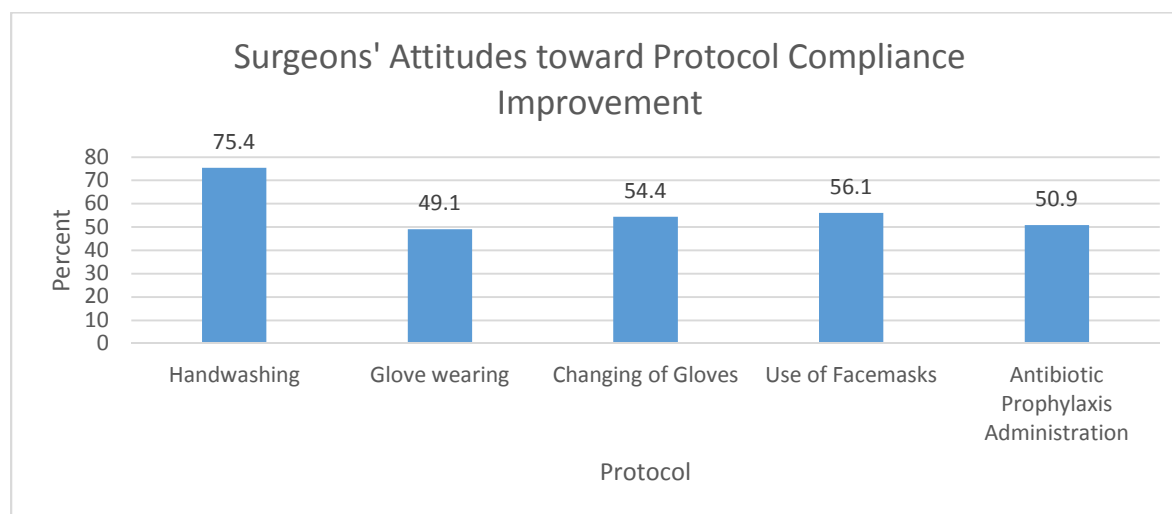
done in the operating room, whereas 29.4% of general surgeons and 0% of cardiac surgeons answered yes to this recommended guideline.

In analyzing the method of patient hair removal used by surgeons, 57.1% of respondents stated that clippers were used in patient hair removal and 42.9% stated that razors were used. In analyzing general surgeon patterns, 75% of respondents were using razors and 25% were using clippers preoperatively.

According to 57 surgeons who responded, 87.7% stated that they are using antibiotic prophylaxis routinely in surgery, with 100% of cardiothoracic and orthopedic surgeons and 82.3% of general surgeons using prophylaxis as a means to reducing surgical-site infections.

When respondents were asked to rate their adherence towards how well they believe they follow protocols for antibiotic prophylaxis, the results were varied. 40.4% of surgeons rated their adherence to antibiotic prophylaxis as very good, 38.6% believe their adherence was excellent and 19.3% believed their adherence was good or average. When surgeons were questioned about whether they believe their adherence to antibiotic prophylaxis can be improved, 96.5% of surgeons agreed to this statement.

Figure 1



Surgeons were also asked about hygienic infection control protocols that they believed they can improve. These protocols included hand washing, wearing gloves, changing of gloves, use of facemasks, and the antibiotic prophylaxis administration. As shown in figure 1, hand washing was the most commonly cited guideline surgeons believed they could improve compliance with 75.4% of respondents, followed by use of facemasks, changing of gloves, administration of antibiotic prophylaxis, and wearing of gloves.

Figure 2

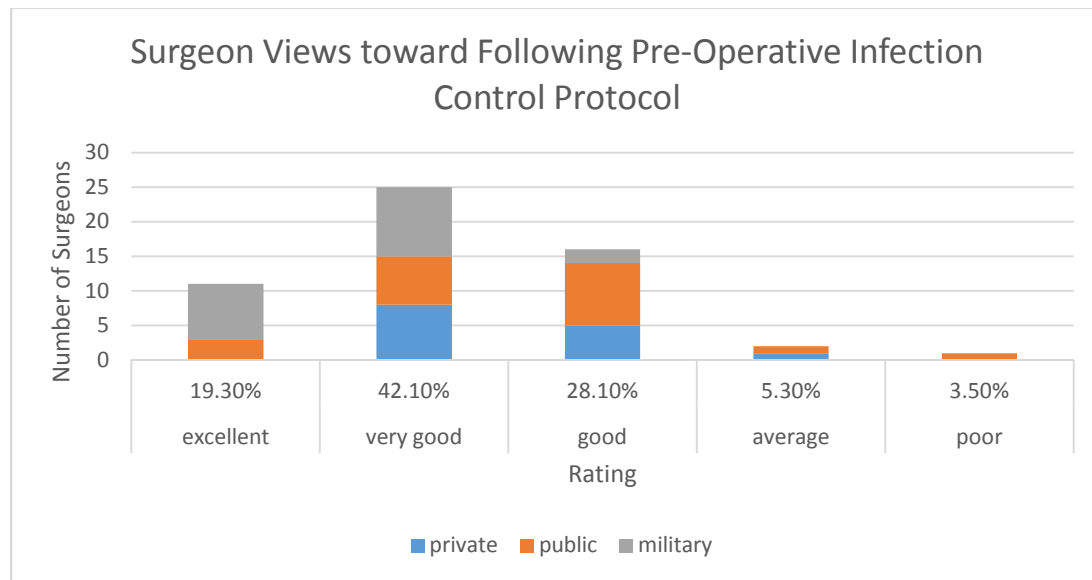
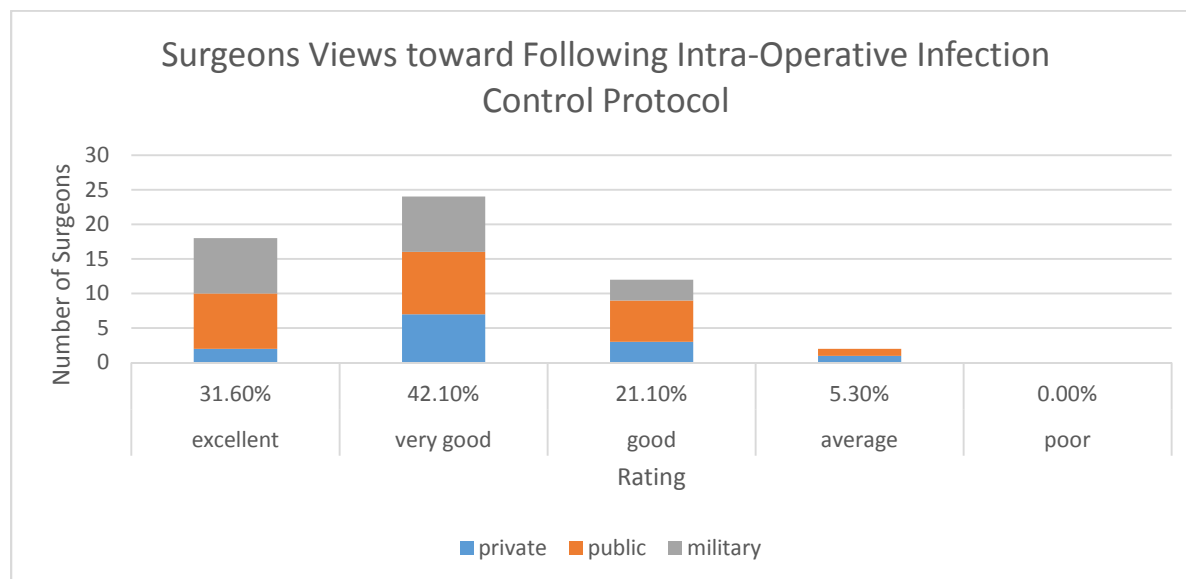
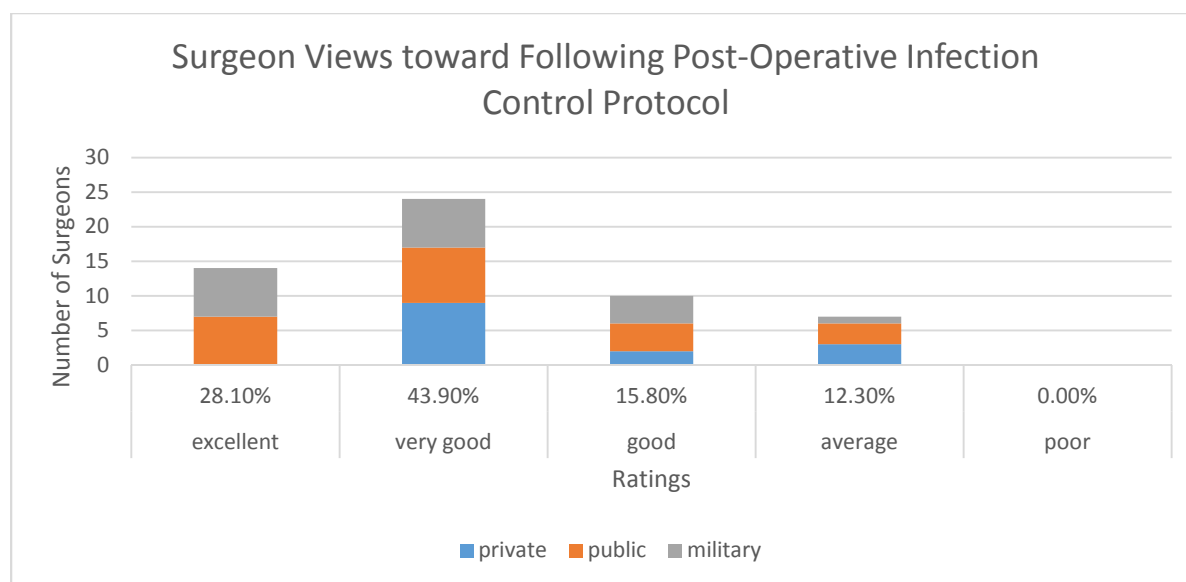


Figure 3**Figure 4**

In addition, surgeons were also questioned to rate their adherence to pre-operative, intra-operative, and post-operative infection control protocol guidelines on Likert poor through excellent scales, as shown in figures 2, 3, and 4, respectively. When measuring all three operative protocol periods, most surgeons rated their adherence to guidelines as very good. Preoperatively, 42% believed their adherence was very good, followed by 28% believing their

adherence was good, and 19% rating as excellent. As shown by figures 3 and 4, results for intra-operative and post-operative infection control compliance were quite similar, with 42-44% of surgeons believing their adherence was very good, followed by 28-31% believing their adherence was excellent, and 16-21% rating their adherence as good.

The final survey question asked surgeons to rate how well they agree with the following statement: infection control guideline implementation plays a significant role in the rate of surgical-site infections. All respondents answered this question, with 66.7% strongly agree, 26.3% agree, and 3.5% and 1.8% undecided and strongly disagree, respectively.

The survey also provided an area for respondents to provide comments regarding infection control. The responses were varied. Many respondents cited that infection control protocol needs to be educated to physicians and surgeons. One respondent specifically mentioned the need to teach nursing and medical students about infection control before they enter the operating room. Another cited the need for a committee responsible for training staff, especially new physicians and surgeons on infection control protocols. It was interesting to note that one surgeon indicated the following, “in public hospital, the most concern is the place factor, not the person factor because mostly the OR is dirty”.

Interviews

Interviews were conducted with both infection control directors and surgeons. By talking to various healthcare professionals, relevant themes became clear. Two of the three infection control directors cited that surgeon the type of antibiotic prophylaxis used was an issue at their respective facility. While all interviewees cited they have protocols for the use of antibiotic prophylaxis, these protocols are not always followed due to various reasons. Some of the cited reasons included surgeons practicing for longer durations resisting to update their practices with

new guidelines. In fact, one infection control director cited that some doctors state, “We want to do what we want to do”. Limitations and difficulties in supervising the administration of antibiotic prophylaxis were also addressed. With regards to surgical-site infections, infection control directors cited that they typically question the type of prophylaxis given when a patient comes back with a surgical-site infection. The two surgeons interviewed also explained the need for better protocol following with antibiotic prophylaxis use.

When asked about the reasons for surgical-site infections, both infection control directors and surgeons cited mistakes in the sterilization of the central sterile services department and sterilization in the operating room. All three infection control directors also cited that staff not following infection control guidelines was another main reason behind surgical-site infections.

The second central theme that was evident in the interviews was the need for more education on infection control for healthcare professionals including surgeons. Four of the five interviewees cited the need for a better curriculum of infection control especially for current medical and nursing students. All interviewees cited the additional need for more workshops on infection control especially for new staff and high rollover rates.

When infection control directors were asked about the education they provide toward SSI infection control, the responses ranged. Two of the infection control directors cited that they provide basic infection control to their health staff and one director cited that the infection control workshops provided are not mandatory and that health care professionals can instead fill the infection control survey their facility provides.

Interviewees were also asked about whether protocols for infection control were written. Two infection control directors stated that protocols for intra-operative infection control are not written and are based on the surgeon’s previous experiences and teachings. In fact, one surgeon

cited that protocol is based on each surgeon and surgical teams own “beliefs” and they are not written. When asked questioned about the period at which surgical-site infections are found, all infection control directors and surgeons interviewed stated that most surgical-site infections were found after discharge. It was interesting to note that one public surgeon addressed the limitations of their facility in handling surgical-site infections, due to limited resources and space at their respective hospital. The other public surgeon stated that surgical-site infections were not a significant issue at their respective facility and were handled “very well”.

Analysis of the Findings

Data analysis of the findings reveals that various facets of surgeon's practices toward surgical-site infection prevention were not in compliance with Centers for Disease Control and Prevention guidelines. The protocols analyzed included preoperative antiseptic bathing, setting and method of patient hair removal, and use of antibiotic prophylaxis.

From the findings, only 47.1% of Jordanian surgeons recommend that patients bath with an antiseptic before surgery. A very similar study conducted in Alberta, Canada analyzing surgeon compliance of infection control protocol found that only 23% of Canadian surgeons recommend preoperative antiseptic bathing (Davis et al., 2008). The Canadian study also cited that the low percent may be due to other health staff recommending this step, which can be a similar reason in Jordanian settings.

Evidence-based recommendations also indicate that patient hair removal should be avoided preoperatively if possible. However, if needed the method should be performed using clippers. When comparing this to the Canadian study, the results were significantly different from those obtained in this research, where 83% of Canadian surgeons surveyed performed hair removal in the operating room, compared to only 29.8% of Jordanian surgeons surveyed. According to the CDC, shaving immediately before the operation compared to shaving within 24 hours before the operation was linked to a decrease in the rate of surgical-site infections (3.1% vs 7.1% respectively) (Mangram et al., 1999). Differences in mandated protocol adherence is likely a significant reason in the gap between the surgeons of the two nations.

When analyzing the type of method used to removal patient hair, only 57.1% of Jordanian surgeons surveyed use recommended clippers which complies with CDC guidelines. In fact, studies have shown that the rate of surgical-site infections increase by 5% when patients

are shaved with razors versus clippers, due to the microabrasions that can act as a source for skin infections (Mangram et al., 1999). It is possible that limitations in hospital resources and staff training in using appropriate removal methods are reasons behind inadequate compliance.

It was important to find that nearly most surgeons surveyed use antibiotic prophylaxis routinely in surgery. This is important, as prophylactic antibiotics reduce the bacterial burden of contamination (Ducel et al., 2002). While its use is important, nearly all surgeons cited that their use of antibiotic prophylaxis can be improved. The overuse of prophylactic antibiotics prior to operation is known to be counterproductive, according to the World Health Organization, as the risk of infection by a resistant pathogen increases substantially (Ducel et al., 2002).

In analyzing the data regarding surgeon ratings toward how well they follow infection control protocol, it was interesting to note that a majority of respondents indicated that they follow protocol as “excellent” or “very good”. Yet, interviews revealed that a majority of protocol is unwritten, especially in the public sector. It is possible that those surveyed based their practices toward the manner in which they were taught. It is also quite possible that recall bias played a role in respondent answers, in addition to respondents providing the ideal answer when completing the survey.

Study Limitations and Future Research

This research provided insight towards the practices and attitudes of surgeons in Jordan. However like all research, limitations were present. While a response rate of 76% is quite good in surveying, only 57 surveys were collected in total due to time and resource restraints. In addition, surveys were given to surgeons of both the private and public healthcare sector. More standardized insight could have been achieved had the research focused solely on public healthcare sector, since most citizens are served by the public healthcare system. However, if both the private and the public sector were surveyed in significant numbers, comparisons between private and public surgeon practices could be assessed for future research. In this study, due to the limited number of private surgeons encountered, comparisons between private and public sectors were not significantly analyzed. In addition, there are evident gaps in the levels of service between public and private hospitals, with private facilities possessing more financial capital and resources compared to the former. Therefore, interviews with more public healthcare professionals could have been beneficial, such as more public hospital infection control directors and public surgeons could have proved noteworthy to the research. In addition, surgeons from different specialties were surveyed. By focusing the research participants towards three main specialties: general, cardiac, and orthopedic, more insight could have been gained and more comparisons could have been made.

Therefore, more research focus needs to be geared toward the infection control guideline conditions of public hospitals in Jordan and comparison can be made of the impact of accreditation towards the practices of surgeons and operating room professionals. By surveying surgeons in addition to operating room technicians, nurses, anesthetists, a more accurate picture of operating room practices can also be attained.

Discussion and Further Recommendations

The purpose of this study was to determine the attitudes of surgeons toward the control of surgical-site infections evaluated by the CDC's guidelines to surgical-site infections, in addition to collecting the opinions of healthcare professionals with experiences towards infection control. The data collected from this study holds insightful information toward the attitudes of surgeons on the prevention of surgical-site infections and improvements that could be made towards general infection control.

The hypothesis that compliance towards surgical-site infection control guidelines needs to be improved is supported by the data obtained in this study. The inadequacies in compliance reveal the need for standardized clinical practice guidelines in Jordan. Standardized protocol provides hospital healthcare professionals with a framework for addressing service delivery, planning policy, and coordination.

From the interviews obtained, the need to establish standardized clinical and infection protocol starts from the medical and nursing schools. Medical and nursing school curriculum needs to be amended in providing standardized education towards both clinical care and infection control guideline protocol. By educating future physicians, surgeons, and nurses of these guidelines from the commencement of their respective educations, clinical and infection control guideline adherence can improve. In addition, minimization of different physician and surgeon protocol can be facilitated with concurrence towards standardized healthcare practices.

From this, appropriate surveillance programs for infection control and clinical guidelines can be implemented within the healthcare facilities themselves. However, the implementation of such surveillance programs cannot be solely at the discretion of individual hospitals, as is the current situation. These initiatives need to be coordinated by a nationalized and mandated

governing body to prevent the result of differences in policies and difficulties in monitoring compliance.

The Health Care Accreditation Council serves as a prime example toward the necessary standardization and surveillance that is needed in Jordanian healthcare facilities. However, accreditation by the HCAC is not mandated in Jordan and can be an expensive process, especially for public sector healthcare facilities with limited financial capital and resources.

Yet, implementation of such a governing body would bridge the gap between the public, private, and military healthcare sectors of Jordan. Through national standardization of guidelines and surveillance programs, improvements toward nationwide patient service can be made and decreases in hospital-acquired infections could be seen.

Of course, all of this cannot be done without the need for adequate leadership that is willing to implement these actions. Governing leadership needs to be aware of the important issues that depend on protocol standardization and likewise must embrace the value of standardization, accreditation, and subsequent surveillance that must necessarily be followed.

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Appendix I

Hello,

Thank you for your participation in this survey. This questionnaire aims to provide information on attitudes of surgeons toward surgical-site infection management in Jordan. This research is being conducted by an undergraduate student, Sara Mater, in affiliation with SIT Study Abroad Program. All of your answers, will be kept confidential and only seen by the researcher. If you would like to have access to the final research finding or have any questions, please send an email to the following address: matesa01@gettysburg.edu.

Thank you,
Sara Mater

Please circle the appropriate response and be as honest as possible in answering all questions.

1. Hospital Type: Public Private Military
2. Surgeon type:
 general vascular cardiothoracic gynecologic

 orthopedic plastic neuro other:_____
3. Duration of practice:

 0-10 years 11-20 years 20-30 years more than 30 years
4. Do you require patients to bath with an antiseptic before surgery?
 Yes No
5. Is removal of patient's hair done in the operating room?
 Yes No
6. If yes, which of the following methods is used to remove patient's hair?
 Razors Depilatory cream Clippers
7. Are antibiotic prophylaxis used routinely?
 Yes No
8. If yes, on average, how long are antibiotic prophylaxis maintained on patients after the incision in the operation room is closed?

 0 hours 1-5 hours 5-10 hours 10-20 hours greater than 20 hours
9. How well do you believe you follow protocols for antibiotic prophylaxis?

 Poor average good very good excellent
10. Do you believe your adherence to the protocols regarding antibiotic prophylaxis can be improved?
 Yes No
11. Do you encourage tobacco cessation for patients 30 days before surgery?
 Yes No

12. How well do you believe pre-operative infection protocol are followed?

Poor average good very good excellent

13. What are the most common protocols that you can improve upon? Please circle those applicable from below:

- a. Hand washing
- b. Wearing gloves
- c. Changing of gloves
- d. Use of facemasks
- e. Administration of antibiotic prophylaxis

14. How well do you believe you follow intra-operative infection protocol?

Poor average good very good excellent

15. How well do you believe you follow post-operative infection guidelines?

Poor average good very good excellent

16. Please circle the response you most agree with:

Infection control guideline implementation plays a significant role in the rate of surgical-site infections.

Strongly disagree disagree undecided agree strongly agree

17. Below, please list any additional comments you may have regarding infection control management:

Appendix II

Semi-structured interview design:

Interviews will be conducted with the healthcare professionals, specifically doctors working in the surgical wards of both private and public secondary healthcare facilities in Amman, Jordan.

Introduction:

Hello, my name is Sara Mater and I am a 3rd year undergraduate student studying abroad in Jordan. Before we begin, I would like to thank you for taking the time to assist me in my independent study project. The topic of this research is investigation of infection control in the surgical wards of secondary health care facilities in Amman, Jordan. This interview is set up so that you are able to elaborate on your responses, and as such, all responses will be kept confidential. After this research has concluded, all recordings will be properly disposed. If you would like a copy of the final research findings, please email me at matesa01@gettysburg.edu. In addition, if you provide consent, this interview will be recorded.

1. Do you agree to have this interview tape-recorded?
2. Please sign the informed consent form.
3. Could you tell me about your role in the surgical ward?
4. What protocols or guidelines do your staff follow to prevent post-operational infections?
5. What protocols need improved compliance at your facility?
6. Do you witness problems with the administration of antibiotic prophylaxis in your facility?
7. What is the infection rate at your facility?
8. What practices do you believe may attribute to these infections?
9. What education does your facility provide in SSI infection control?
10. Do you believe more education is needed in infection control?
11. What recommendations do you have to tackle infections and/or improvements that could be made?

Thank you for your time. Once again, if you are interested I can provide you a copy of the research findings once they are released.