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Research Project Proposal

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Introduction

Microbes, such as bacteria, fungi, and viruses are known to be the leading causes of infection. An infection of urinary tract is associated with the urine formation system. This tract can be host to several health bacteria, where the infective ones are quickly eliminated from the system when available. Part of the system that can be infected is a bladder, which causes a disease called cystitis (Griebling, 2007). Urethritis affects the urethra, and the kidney is pyelonephritis which is caused by the diffuse spread of infectious organisms into kidneys (Schappert & Rechtsteiner, 2006). The bacteria E. Coli is the primary cause of UTIs. Urine backflow to the kidney is controlled by the one-way valves, formed by a bladder and ureters. The mechanism is aimed at prevention of the infection.

The prostate is an organ in the urinary system that is significant in the control of urine outlet. Males with enlarged glands are predisposed to urine retention. The accumulation leads to the generation of microbes that cause UTIs. One factor that is thought to cause infections but is still under study is the use of condoms. The traumatic activity to the vaginal walls opens up the membranes that in areas that normally have microbes in their beneficial state become risks for getting a UTI (Griebling, 2007). Birth control is also a problem that has been set for

review by medical teams. The use of spermicides and diaphragms has been said to contribute to the growth of bacteria which lead to UTIs. Those that have recurrent infections are advised to switch to different family planning methods.

During pregnancy, the disease can pose a serious danger to both a mother and an unborn baby. The primary challenge with the pregnancy duration is the fact that mothers cannot be prescribed for the routine antibiotic therapy that is used in the non-gravid state. Treatment has to be considerate of the neonate and health of the mother. Some of drugs are teratogenic, therefore, they are contraindicated.

A different category that is highly predisposed to UTIs are the elderly. Their bodies are already at a phase that is asymptomatic of microbes, associated with the infection. Bacteriuria is not a disease. The normal flora of a urinary system is present at a young age, however, for those aged above 65, the number increases significantly. For this particular group, diagnosis of a disease is made through urine sample cultures. Therefore, this paper tries to investigate the relationship between UTIs and some other factors, such as age, gender, pregnancy and the use of catheters.

Significance of the Problem

The purpose of this study is to have a wider look at the urinary tract infections. Also, this research aims to find out what are the predisposing

features to the contraction of the disease. To identify the groups that are more at risk than others and some of the measures that have been studied previously to help in the prevention of disease. Most UTIs are not serious infections. However, some have recurrent to some people, therefore, they lead to more complications. One of the dangers is kidney disease. Kidney failure is the end stage of the disruption of urinary system. The kidneys become incompetent in the excretion of wastes, especially uric acid. It is important to study the infections in order to enable the public to get the knowledge on how to prevent them from contracting diseases.

Background of the Study

UTIs are the second most common infection of the body and approximately 8.1 million people visit the hospital annually (Griebling, 2007). People lack information on the predisposing factors of UTIs which have led the NIDDK, to form UDA, which is a unit aimed at generating information on the burden that the disease has on people of United States. Women are, however, more predisposed to infection than any other people. Another high-risk group are patients that have spinal injuries that paralysis either of the nerves system of the extremities. The bladder is also controlled by nerves that are significant in the way urine is eliminated and, eventually, the chances of getting infections.

Catheters that are used by the patients due to immobility are the modes of transmission. The patients who already have comorbidities cannot take care of them (Hooton et al., 2010). However, studies indicate that

for patients who are admitted to critical care, the tube has to be changed fortnightly. Those that recover but have to maintain the catheter in situ have to visit hospitals for continued care. Alternatives have been researched on to give a choice to patients that it is not necessary for them to have the indwelling type. A condom catheter also called Uridom is used for some patients to substitute. A suprapubic catheter is also an option that has been considered invasive but more sterile for infection prevention (Hooton et al., 2010).

Statement of the Problem and Purpose of the Study

The identified problem is urinary tract infections. It is important to do research on the predisposing factors to the disease to create awareness to people on how they can prevent themselves from it. Available literature shows that there are several high-risk categories of individuals. Therefore, it is necessary to identify patients from all the groups in the target population, so that the results can be as accurate as possible.

Literature Review

Urinary tract infection affects the upper or/and the lower part of the urinary tract. Microbiological bacteriuria should not be confused with urinary tract infection (UTI). In India, UTI is a major cause of morbidity

and mortality, affecting all age groups (Artges, 2004). The urinary tract is divided into the upper (kidneys, ureters, and renal pelvis) and a lower portion (urinary bladder and urethra). The inflammatory response of the urothelium is what is referred to as UTI. In UTI, the bacteria must stay in the urothelium, where it multiplies and sticks with the urinary bladder. For the last decade, the manners in which bacteriuria and UTI are clinically addressed have greatly evolved (Hooton et al., 2010). The presence of this disease-causing bacteria in the bladder does not necessarily result to cause the disease. Such are diagnosed as having asymptomatic bacteriuria. The difference between UTI and ASB is of great importance to patient management (Schappert & Rechtsteiner, 2008). The unitary tracts of many humans contain traces of bacteria, though they are negative of UTIs. In adults, 17% of women and 5% of males have tracts without infection (Schappert & Rechtsteiner, 2008). There are several research works which discuss the UTIs concerning factors, such as age, gender, etc.; this section will discuss previous literature from such articles.

An article by Bartges (2004) tries to discuss the major symptoms of UTI's. The given article states that stranguria, pollakiuria, and hematuria are the common symptoms of UTI, but many vary, depending on the type of pathogen. Bartges (2004) proposes that the urine samples and microscopy are the standard methods of diagnosis of UTI because they have proved to produce more accurate results than other tests. Also, this article states that the UTIs are more common among elderly people (above 40 years) than the young people. Therefore, the researcher suggests that young people should be tested early in order to ensure

that they do not have these pathogens once they age.

Also, an article by Foxman (2002) tries to study the relationship between the pregnancy and development of UTIs. The researcher used a random sample of pregnant mothers from different hospitals in the United States of America, where he observed them from the time of conception to giving birth. The current paper conducted tests on these mothers twice every month, so as to determine whether they develop the symptoms of UTI or not. The results revealed that there was a positive relationship between UTI and pregnancy, but this relationship was not quite significant. Therefore, the researcher recommended that more research works on the same topic are important, but they should include some confounding variables in the model. The variables include the number of births the woman has, the age and the previous medical history.

Kahlmeter (2003) investigates whether UTIs are dependent on a patient's gender. The researcher used stratified random sampling, where he divides the target population according to its gender. He then selected a sample of 75 individuals from each stratum and conducted tests to confirm that they have any of the UTIs. The analysis also included age of a person as the confounding variable. Once the results were obtained, it became clear that the confounding variable in the model was significant. Also, gender did not have a significant influence on the development of UTIs. Therefore, the researcher recommended that equal measures are necessary for preventing and treating UTIs in both males and females.

Lastly, the article by Gould, Umscheid, Agarwal, Kuntz & Pegues (2010) tries to investigate if the unconscious patients nursed with catheters are at a greater risk of getting infected. The researcher selected a sample of 120 patients who were nursed with catheters from different hospitals across the United States of America. The control group in this experiment was individuals who do not have catheters; the current paper considers a sample of 120 individuals. Then, there was a closer examination of the selected persons in both groups, where the researcher conducted UTI tests after every two weeks. The confounding variables in this paper were age and gender of persons. From the analysis, it was evident that age was a significant confounding variable, while gender was not significant. Patients with catheters proved to be at a greater risk of developing UTIs, as compared to the control group. The researcher concludes that health officials should take care when nursing patients with catheters because they put them at a greater risk of contacting the UTIs.

Research Questions

1. What is the relationship between UTI and age?
2. Does pregnancy predispose mothers to contract UTI?
3. Are unconscious patients nursed with catheters at risk of infection?
4. What is the difference in the prevalence of UTI among adult males and females?
5. What is the relationship between UTI and family planning?

Hypothesis of the Study

1. **Null hypothesis:** There is no significant relationship between patients' ages and the incidence of UTI.

   Alternative hypothesis: There is a significant relationship between patients' ages and the incidence of UTI.

2. **Null hypothesis:** There is no significant difference between prevalence of UTIs in males and females.

   Alternative hypothesis: There is a significant difference between prevalence of UTIs in males and females.

3. **Null hypothesis:** There is an insignificant evidence that catheters are at a risk factor for UTIs.

   Alternative hypothesis: There is a significance evidence that catheters are a risk factor for UTIs.

4. **Null hypothesis:** There is no significant relationship between UTI and family planning methods.

   Alternative hypothesis: There is a significant relationship between UTI and family planning methods.

5. **Null hypothesis:** There is no significant relationship between pregnancy and preference of UTIs.

   Alternative hypothesis: There is a significant relationship between pregnancy and preference of UTIs.

Variables

According to Heffner (2012), variables are aspects of a research study that have the potential to change based on the interaction provided by the survey. Dependent variables are difficult to manipulate, therefore, they are more constant. Independent variables, on the one hand, rely on changes of different phenomenon. In this study, the dependent variable is an urinary tract infection. It is the measure upon which other factors are used as influencing ones. On the other hand, independent variable is the predisposing factor that leads to UTIs. These factors include gender, age, state of pregnancy, family planning methods, and use of catheters on patients.

Definition of Terms

UTI - Urinary tract infections.

Catheters - A tube placed into the bladder to help in urine excretion.

NIDDK - National Institute of Diabetes, Digestive and Kidney Diseases.

Supra public - A thin tube inserted through skin into the bladder at the lower abdomen level.

UDA - Urologic Diseases in America.

Theoretical Framework

Overview and Guiding Propositions: Problem

Unitary tract infections have become a severe public health problem brought by several pathogens. Nowadays, they are considered to be the most common bacterial infection by the Medicare surveys. Its high rates of recurrence and the alarming rise of antimicrobial resistance are threatening to heighten the economic burden caused by these infections. However, assessing the accurate incidence of UTIs is a problem since diseases are not reportable in the United States of America. Further, the situation is made complex because an accurate diagnosis is obtained in the presence of a positive urine culture and its symptoms.

History of Diagnosis

Diagnosis is made in adults with Dysuria, urinary urgency, bloody urine, fevers and unusual tenderness. Diagnostic studies for UTIs include dipstick, culture, and urinalysis. Urine culture until now is the conventional criterion for diagnosis of UTIs.

Application of Theory to Study Focus: Theory

Research states that females are at a higher risk of contracting UTIs than males because of their anatomy. Other risks of contracting UTIs involve conditions that prevent the flow of urine, such as enlarged prostate, inflammation, and congenital urinary tract abnormalities. Persons at a higher risk are also patients who had urinary surgery and men having enlarged prostrates. People who use spermicide-coated condoms and diaphragm for contraception are also at a higher risk of getting UTIs.

The probable ways of transmitting UTIs are still not clear; some investigators say that UTIs cannot be spread from one person to the other, while others argue that they are contagious through sexual intercourse. It is argued that during sexual intercourse, the bacteria may get into the urinary tracts.

For frequent infections, the doctor may recommend treatments, such as low dose of antibiotics, self-diagnosis, and treatment or vaginal estrogen therapy. For severe infection of UTI, treatment may be required with intravenous antibiotics. Recurrent UTIs can occur when urethra is irritated after sex.

UTIs are usually diagnosed by identifying and isolating the urinary pathogen from a patient. These involve home tests for presumptive diagnosis. Several home remedies for UTIs and most of them are effective in reducing the risk or discomfort that may be caused by diseases. Complications can develop in the midst of treatment of the UTIs. The complications may include kidney stones, sepsis, kidney

failure or dehydration. There may be no vaccine but there are several ways in which people can reduce their chances of acquiring UTIs.

Rationale

The symptoms of UTIs vary according to age, sex, specific area of infection and infecting agent. In treating Urinary Tract Infections, antibiotics are usually the first stage. The drugs to be prescribed and the length of time to take those drugs depend on the health condition and the kind of bacteria in urine. Usually, the symptoms of UTIs are clear up after a few days of treatment. In the case of uncomplicated UTIs, a shorter treatment may be recommended, and the short course depends on specific symptoms and medical history. An analgesic may also be prescribed to numb the bladder and urethra to relieve burning when urinating. The analgesic has a side effect of discolored urine.

Medical History and Treatment

A thorough examination and medical history help to rule out other causes of the patient's symptom. Medical history and physical examination found the following symptoms for UTIs: pain when there is pressures on the lower back, abnormalities were seen during the rectal exam, enlarged prostate gland for men and discharge from the urethra. The examination involves evaluation of the history of prostrate problems (men), pelvic infection, tenderness of the lower abdomen and

examination of rectum and genitals. Treatment involves administration of the urine culture and trimethoprim from one to two weeks.

Methodology

Methodology section is vital to any research proposal. The section describes the rationale that deploys the defined procedures used in the proposal (Corb, 2012). These procedures are identically used in analyzing information that is critical in understanding the underlying research problem. It is true that understanding the research problem will enable readers to evaluate reliability and validity of the study at hand. Most importantly, this section is paramount in answering the way data has been collected or generated and how such data were analyzed. The methods of data collections involve sampling techniques, where the data collected are recorded in the Excel. The process of data cleaning is then performed to remove outliers and some other unique variables that are not a part of the study. The analysis is then carried out using Statistical Software (SPSS) to test the hypotheses.

Sample

Success of any research is dependent on the quality of its sample. Since this is a quantitative study, the selected sample should fully represent the target population (Creswell, 2013). Therefore, the researcher will utilize a sample of 80 patients in a local hospital setting. The researcher

decided to use 80 participants because of time and capital limitation. More than 80 participants would be above the research's budget, and less than 80 people would yield results which may not be generalizable.

Sampling Strategy

The inclusion criteria include:

1. Males and females between the ages of 18 and 65 years.
2. People within the age group who have experienced UTI episodes in the last few months or one year.

The exclusion criteria for this study include:

1. People with a history of uterine, prostate, vaginal or cervical cancer.
2. Women who were tested positive for pregnancy, pregnant or lactating women or women who are planning to get pregnant within the period of this study.
3. People with a history of chemical cystitis, pelvic irradiation and neurogenic bladder.
4. Patients who currently have pelvic, rectal or urethral carcinoma.

Research Design

The sample will be selected randomly to avoid bias and subjectivity, which might affect reliability and validity (Creswell, 2013). The

researcher will use stratified random sampling methodology, where he will stratify the target population into different groups. The stratification process will depend on gender and pregnancy status of respondents. After stratification, the researcher will select a simple random sample from each group. Selection of the sample will be in such a way that the total sample size will be 80 people. The main reason for using stratified random sampling is to ensure that the sample is representative of the whole target population. A descriptive research design will be used for this study, meaning that the study will take place without affecting or manipulating the environment. This type of research will help in providing information about the group under consideration and their health.

Extraneous Variables

Controlling Extraneous Variables

This section describes the variables, other than independent variables that may have an effect on dependent variables. In our research proposal, extraneous variables are things that could affect UTI levels. However, extraneous variables can be controlled through deploying different strategies. The use of randomization has been widely used to equate different groups of the infected based on gender. Besides, standardization of procedures and instructions is among the control measures that can be applied to extraneous variables; it involves equal participation on variables to be controlled, such as gender. Most importantly, such variables can be controlled through deception in

which participants are provided with unrelated rationale. Extraneous variables include the depended variables like the infection based on gender. It influences the statistical conclusion. The variable can be eliminated when carrying out the statistical correlations and student t-tests when concluding on relationships.

Appropriate Instruments for Research Question

This section describes the fact-finding strategies. It defines the tools that are used for data collection. Such strategies are not restricted to questionnaire, interview, readings, and observation (Zaza et al., 2000). It is notable that the choice of tools should be valid and with high reliability. Specifically, questionnaires are usually used in data collection, mostly in normative surveys with a high level of accuracy and preference. The research will apply the use of questionnaires and mobile applications in submitting data from the field. The mobile applications are reliable, since they are designed to eliminate outliers instantly. The data from hard questionnaires will be entered into excel spreadsheet and cleaning will be carried out after that.

Description of Instrument

Among the instruments that are used in data collection to respond to the underlying research questions include interview, questionnaires,

observations, and readings. On the one hand, questionnaires involve providing both structured and unstructured questions to respondents as a methodology of collecting information, based on a particular research question (Zaza et al., 2000). The questionnaire is mostly used because it is efficient in the field. On the other hand, interviews are highly effective when there is a need for face-to-face communication. It encompasses one-to-one interaction between a researcher and a respondent. The interview method is encouraged since the research can win the respondent to extract sufficient information required (Zaza et al., 2000). Furthermore, observation has been widely used in research proposals to obtain a more comprehensive data that involves oral and visual aspects. The online literature from different sources will be used to gather data from different variables.

Validity and Reliability Estimate

Reliability and validity are much related; as much as they may seem different. Research may be said to be reliable when the target is hit, while the center of the target is not well defined. Conversely, validity will be defined when you hit randomly across the target based on the research question (Taylor, 2013). Withal, to estimate both reliability and validity concurrently, there is a need to define and hit the center of the target as planned. The primary data analysis tool in this study is SPSS version 21. The software is reliable, as it has all the analysis components; it also has an excellent graphical feature that produces clear pictorial representation.

Description of the Intervention

This section entails the study of arranging a research study in a systematic order that can be easily followed and understood. It involves systematic changes that occur in conditions to determine effects on skills, performance, and physical capacity. The main parts for research intervention include the title, purpose, methods, results, and conclusion of the research. The research study will involve face-to-face interaction with the study participants to obtain the first-hand information. The interviewee will also be able to observe the body language to ensure the accuracy of data collection.

Data Collection Procedures

It involves all the processes that relate to obtaining data and information regarding research question. The usually used procedures include primary data collection, where the instruments, as mentioned above, are deployed. Besides, secondary data collection is used to obtain information that has been published in media. Therefore, these procedures intend to establish data for analysis in the research. The sampling method of data collection will be also applicable. The portion of participants will be located in the different study; they will be interviewed, and all the data will be recorded under each variable in a questionnaire. The data from different questionnaires will then be entered into an excel spreadsheet.

Data Analysis Plan

This research is a quantitative study, since it uses numerical data in testing its research hypothesis (Jirojwong, Johnson, & Welch, 2014). Also, the study will have two types of variables, which include demographic variables and study variables. The core importance of demographic variables is to help the researcher determine general characteristics of the respondents under study (Ulin, Robinson, & Tolley, 2012). The researcher will employ some visual statistical aids, such as bar graphs and pie charts in presenting the demographic information. In addition, some statistics, such as measures of central tendency (mean, medium, etc.) and measures of dispersion (standard deviation, variance, etc.) will be of great importance.

The analysis of study variables will be divided into two parts, which include the descriptive analysis and the inferential analysis. In the descriptive analysis, the researcher will use some point estimates such as measures of central tendency and dispersion. This research will employ interval estimates such as the confidence intervals in presenting information on some of numerical variables. Besides, the researcher will use t-test in testing whether the proportion of those who develop UTI's when pregnant is statistically different from those who are not pregnant. Also, this study will use the same test (t-test for two sample proportions) in testing if the proportions of the persons who develop UTI's when nursed with catheters are different from those who are not nursed with catheters. T-test will be used in confirming if the preference

of UTI in males is different from females. Lastly, this paper will use logistic regression analysis (binary regression) in testing if the age has a significant effect on the development of UTI. In all these tests, the researcher will use as the level of significance so as to ensure that the research results are as accurate as possible.

Ethical Issues

Every scientific research should follow the strict laid down ethical procedures and rules. Some of these rules include honesty, where every researcher is required to produce original information and data. In case the researcher wants to use information from any external source, he/she is required to ask permission from the author and reference accordingly. Therefore, integrity should be observed in every scientific research. Here, the researcher is expected to produce correct results and data. This ethical concern is achieved by using the correct data collection instrument, and the instrument should be free from errors. Lastly, the researcher should always maintain the confidentiality of respondents.

This research will maintain honesty by referencing all the outside sources. Also, the researcher will ask for data collection permission from the ministry of health and hospitals which will be under consideration. On the other hand, the researcher will maintain the accuracy of the data and results by using a questionnaire tool with precise and simple questions. All the questions will address the

research hypothesis, and they will yield quantitative data. Lastly, this paper will maintain confidentiality of respondents at all costs. Respondents will not be expected to give their names or personal numbers in the questionnaire. The researcher will not give any part of information or data to any other external parties, and he will destroy the questionnaires immediately after the report writing phase. This strategy will ensure that no questionnaire will land to any unauthorized persons. The raw data will be stored electronically in an encrypted computer drive, and the password will be stored by the principal researcher. All these strategies ensure that no data or information leaks to the outside parties.

Limitations of Proposed Study

This study does not have any major limitation, which can limit its applicability and generalizability. The most common disadvantage is that some people might be unwilling to disclose their medical information such as their pregnancy status and medical history. This limitation might lead to getting inaccurate or insufficient data. The researcher will overcome this limitation by using a significantly small level of significance (alpha=0.05). This strategy will ensure that the results are as accurate as possible.

Implications for Practice

This research has several positive implications. First, the people will be able to know the ways in which they can prevent the occurrence of UTIs. In addition, the general population and health fraternity will have knowledge of factors, which contribute to an increase in the preference in UTIs; therefore, they can take necessary prior actions. Lastly, the results of this research can be important and may form a basis to a person conducting a study on the similar topic. Other researchers cab quote parts of this study thus facilitating their investigations.