FACTORS ASSOCIATEDWITH OCCURENCE OF GUT PERFORATIONS IN KAGANDO HOSPITAL, KASESE DISTRICT

AN UNDERGRADUATE RESEARCH PAPER PRESENTED TO THE SCHOOL OF NURSING IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE AWARD OF A BACHELORS DEGREE IN NURSING SCIENCES

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JESSICA MASIKA

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DECLARATION

I **Jessica Masika** hereby declare that this work is purely my original work based on my knowledge and has never been published or submitted for any Academic award at any University or other institution.

Signed: ……. Date: ……..

Jessica Masika

2008-BNS-FT-006

APPROVAL

Signed: …….. Date: ……..

Mr. Afayo Robert

(Supervisor)

DEDICATION

I dedicate this work to my family especially my mum Ms Joy Mbambu and Maria for all the encouragement and unending support towards my studies.

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ABSTRACT

Introduction

Gut perforation had turned out to be an epidemic in Kasese district between 2007 and 2009. In 2011, 600 patients were treated with gut perforation and 120 of them died while 480 were discharged. It is from this background that the researcher decided to carry out a study and compare with what other scholars had found concerning the gut perforations.

General objective

The main objective of this study was to identify the key factors associated with gut perforation among patients seeking health care services at Kagando hospital.

Methodology

A community-based case-control study was done in which 57 cases who had been managed at the hospital for gut perforation were studied. Cases still admitted in the hospital wards were not available for interview by the time of study and therefore had to identify cases from the hospital records for patients worked on during the period of interest for the study and follow them to their homes. 57 neighbors to the cases living in the same environment not suffering or having suffered from gut perforations were interviewed and included in the sample as control cases. Data was collected using questionnaires while descriptive, bivariate and multi-variate analysis was done.

Results

Male gender (OR=3.02, CI=1.10-8.28, P=0.031) and typhoid fever (OR=29.88, CI=3.58-249, P=0.002) were significantly associated with gut perforation at multivariate analysis.

Conclusion

This study showed that being male and having a history of typhoid fever were significantly associated with gut perforation. I recommend therefore that whenever a patient is diagnosed with typhoid fever they should seek medical care as early as possible before it complicates to gut perforation. Community health workers need to put more efforts in health education and sanitation.

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Acronyms

ASA	American Association of Anesthesiologists
CDC	Center for Disease Control
CI	Confidence Interval
KARUDEC	Kagando Rural Development Center
NSAIDS	Non-Steroidal Anti-Inflammatory Drugs
OR	Odds Ratio
PUD	Peptic Ulcer Disease
UK	United Kingdom
WHO	World Health Organization

Operational Definition of Key Terms and Concepts

For purposes of this study, the following terms have been defined as follows:

Epigastrum - The part of the abdominal wall above the umbilicus (belly button)

Flatulence - A state of having excessive stomach or intestinal gastrointestinal gas.

Dyspepsia - Painful or disturbed digestion

Cases - Patients who are exposed to a particular disease

Controls - Respondents who are not exposed to a particular disease

Rebound tenderness - Pain or tenderness that occurs upon sudden release of pressure especially abdominal pressure.

CHAPTER ONE

INTRODUCTION

1.1 Background of the study

A perforated bowel is a medical emergency in which a hole in the bowel opens to allow its contents to empty into the rest of the abdominal cavity. The result is frequently sepsis or blood infection, which if not treated can cause almost immediate death.

Gastrointestinal perforation is a complete penetration of the wall of the stomach, small intestine or large bowel, resulting in intestinal contents flowing into the abdominal cavity. Perforation of the intestines results in the potential for bacterial contamination of the abdominal cavity (a condition known as peritonitis). Perforation of the stomach can lead to a chemical peritonitis due to leaked gastric acid. Perforation anywhere along the gastrointestinal tract is a surgical emergency (Lewis et al, 2010).

Patients present with sudden pain in the epigastrum which radiates to the mid-line when the perforation is as a result of duodenal ulcers. In case of gastric ulcer the pain is in epigastrum. There is history of burning pain in epigastrum, flatulence and dyspepsia. History of drug intake without sufficient food intake may be present. In case of intestinal perforation pain starts from the site of perforation, visceral, and then spreads all over the abdomen. In any case there is rigidity of abdomen, tenderness, and rebound tenderness, after sometimes the abdomen becomes silent with no bowel sounds being heard. Patient stops passing flatus and motion, abdomen are distended. Gastrointestinal perforation results in severe abdominal pain intensified by movement, nausea and vomiting. Later symptoms include fever and or chills, (Lewis *et al* 2010).

Globally, it has been documented that gut perforations have been rising from 6-42% mainly in India, Nepal, Sri-lanka, China and Pakistan. It has also been documented that there could be a geographical variation with China having a prevalence of 6%. Thailand has a prevalence between 0.016 to 0.2% of gut perforations (Sanjay and Robin, 2006; Lohsiriwat, 2010).

In East central Africa the prevalence of gut perforation is between 0.8 and 18% has been reported in literature (Tade , Otaleju et al, 2011).

In Benin city in Nigeria the occurrence was found less according to other areas in the same country and the study was done in a 26 year period. Although other studies indicated an increase in prevalence they found out that there were other cause too for instance, socio-economic and socio-demographic factors (Mieier et al, 1998).

In Sub-Saharan Africa, which included Malawi, Mozambique, and Tanzania the occurrence of intestinal perforations was reported to be increasing and in this case the major cause was reported to be typhoid fever which affects 8092 people per 100,000 persons (Neil et al, 2009).

Globally, there is an increased prevalence of gut perforation, however, this has been observed in the under developed countries or states like India, South East and South Central Asia and Africa. There has been control of gut perforations in North America and Europe due to effective public health measures (WHO, 2004).

Most intestinal perforations are found to be in the tropic areas of the world which are also endemic for typhoid fever which is responsible for 22 million cases and 216,000 deaths annually worldwide (Neil et al, 2009). Most of these areas have poor diagnostic capacity, lack clean drinking water, have poor sanitation and lack medical facilities as a result of poor infrastructure (Ajao, 1982).

This condition has been reported in patients that seek medical care at Kagando hospital since 2009. It is not clear as to what really influences the prevalence of gastric perforation in people that seek medical care from Kagando hospital in Kasese district, (MoH ,2010).

According to an annual report of Kasese in Uganda, about 1444 people have been operated with gut perforations and the mortality rate is between 20-30%. There is also information that the affected areas in Uganda are Kasese, Mbarara, Ishaka and Fort Portal (Enid and Felix, 2011). The most common cause of gut perforation documented was found to be as a result of typhoid fever and this accounted for 216,000 deaths annually which is a large number of the population (Neil et al, 2009). Peptic ulcer disease is also another cause of gut perforation with a prevalence of 12% in men and 10% in women in USA. The risk factors for gut perforation in Kasese are not clearly known.

Therefore the aim of this study is to determine the factors associated with the prevalence of gut perforation in Kagando hospital.

1.2 Statement of the Problem

Gut perforations are a complication of several gastrointestinal diseases which among others include peptic ulcer disease, Crohn's disease, and typhoid fever, among others. Kagando hospital registered a high number of 360 patients with gut perforations in 2010 in the whole district, (MoH, 2010). Most of the cases reported at the hospital were associated with high mortalities and yet diseases that complicate into gut perforations are curable.

A community survey was done between December 2007 and July 2009 in Kasese district which involved 577 cases. 289 were hospitalized from whom 249 were found to have gut perforations as a complication from typhoid fever (Neil et al, 2009). In 2011, 600 patients were treated with gut perforation and 120 of them died and the 480 were discharged.

Estimated typhoid fever annual incidence in the community survey was 8092 cases per 100,000 persons and 47 deaths (Neil et al, 2009).

According to the district annual report, about 1444 people have been operated since 2007, with a mortality rate of 21%. It has been noted that there is a death rate of 20 to 30% for admissions with gut perforations despite a prolonged treatment and repeated operations (Enid and Felix, 2011). The risk factors associated with the increasing number of cases of gut perforations are not clearly known. This study hopes to elucidate these risk factors so that interventions can be developed to remedy the problem.

1.3 Objective of the Study

1.3.1 General objectives

The main objective of this study was to identify the key factors that are associated with gut perforations among patients seeking health care services at Kagando hospital between August and September 2012.

1.3.2 Specific objectives of this study include:

1. To identify socio-demographic factors associated with gut perforations among patients of Kagando hospital between August and September 2012.
2. To establish common medical conditions associated with gut perforations among patients of Kagando hospital between August and September 2012.
3. To determine health facility factors associated with gut perforations among patients of Kagando hospital between August and September 2012.
4. To identify lifestyle factors associated with gut perforation among patients of Kagando hospital between August and September 2012.

1.4 Research Question

1. What are the socio-demographic factors associated with gut perforations among patients

of Kagando hospital between August and September 2012?

2. What are the lifestyle factors associated with gut perforations among patients of Kagando hospital between August and September 2012?
3. What are the common medical conditions associated with gut perforations among patients of Kagando hospital between August and September 2012?
4. What health facility factors are associated with gut perforations among patients of Kagando hospital between August and September 2012?

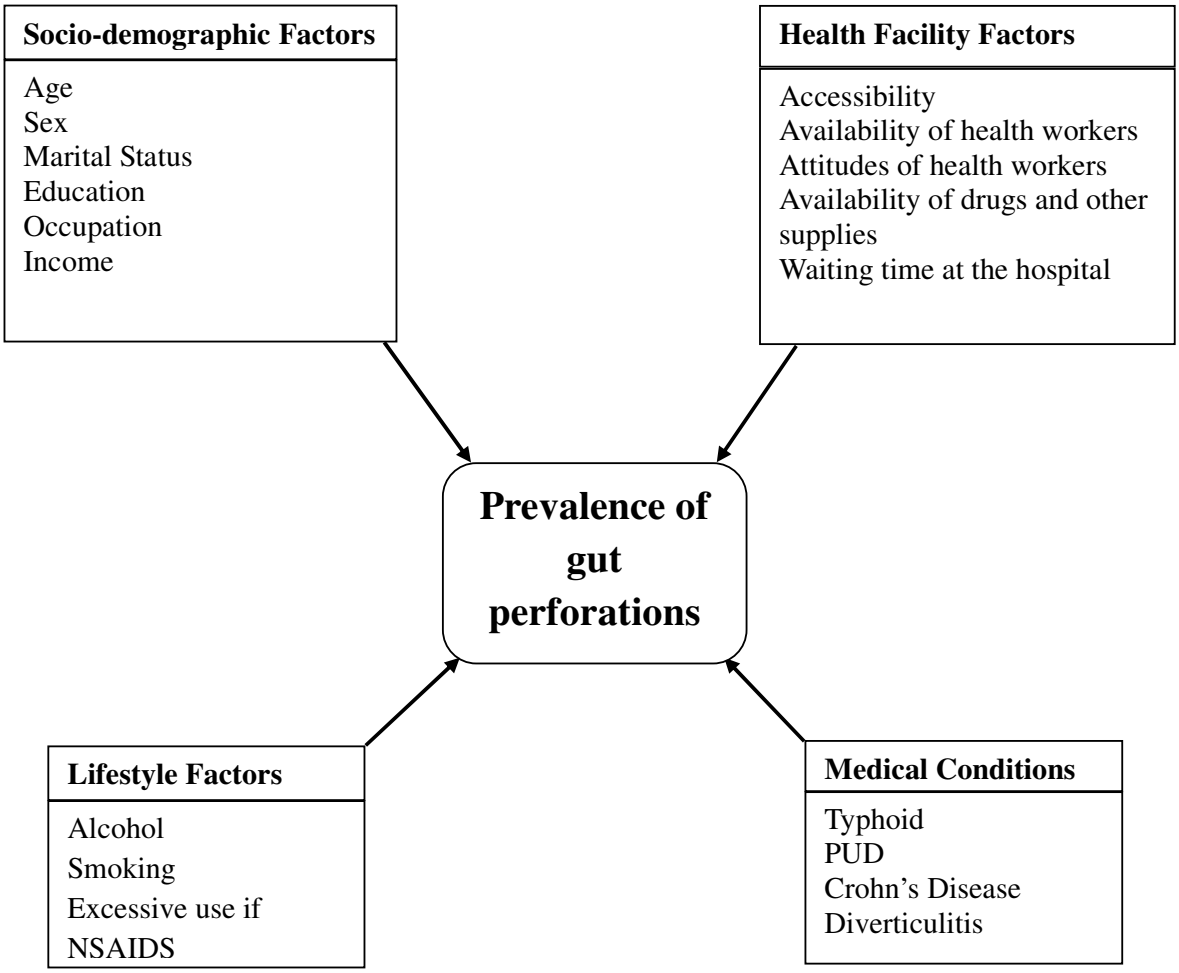
1.5 Significance of the study

Not many studies have been done in relation to factors associated with gut perforation to generate information to explain why there is high prevalence of gut perforation among the population living in Kasese district. This study is to identify the key factors that are associated with gut perforation in Kagando hospital, provide the necessary information and recommendations that will contribute to specific action plans by both the hospital and the ministry of health to address the structural and non-structural limitations that lead to the prevalence of gut perforations in Kagando hospital.

The findings in the study will also be used to inform local leaders to develop strategies to remedy the problem.

Therefore the aim of the study is to determine the risk factors associated with gut perforation among the members of Kagando community, Kasese district.

1.6 Conceptual Framework



1.5.1. Explanation of the Conceptual Framework

The conceptual frame work above describes how socio-demographic factors, lifestyle factors, medical conditions and health facility factors associated with the occurrence of gut perforations.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This section presents the review of existing literature on the factors associated with gut perforation in Kagando hospital. The literature will be reviewed according to the themes generated from the study objectives.

2.2 Background

Gut perforation is a disease that occurs as a result of one's intestines developing deep ulcers. The disease is related to perforation of the intestine or gut. This allows the contents of the intestine to enter the peritoneal cavity which causes acute inflammation with sudden abdominal pain and shock (Oxford medical dictionary, 2003).

With gut perforations surgical repair of the perforation is the treatment of choice and it has been cited as the best form of treatment. According to the World Heath Organization, gut perforation has been a serious problem and it has been documented that the major cause of gut perforation is typhoid fever where by they are a complication of the disease. It's impact has been difficult to estimate because diagnosis of perforation is made late since the clinical picture is confused with other infections (WHO, 2003). Additionally, gut perforations are underestimated because most of the areas affected are in Sub-Saharan Africa or in developing countries where there are limited medical resources due to poverty (Chalya et al, 2012).

Early surgical intervention is the treatment of choice and the fact that most patients come late, their body is weak and it affects treatment making the prognosis poor because usually when the perforation is detected it should be repaired within six days. Once delayed it leads to a mortality rate ranging between 10 to 32% (WHO, 2003).

There is a global estimation of typhoid fever according to literature reviewed to have an incidence of 17 million cases annually which means more chances of intestinal perforations which result mainly from typhoid fever (WHO, 2003).

2.3 Social Demographic Factors and Gut Perforations

Globally, the sex factor has been cited in most of the studies carried out concerning gut perforations. According to Chalya et al, 2012 in a study carried out in North Western Tanzania on 104 cases, 72.1% patients were male and 27.9% were females with the ratio of male to female being 2.6:1. In another prospective cohort study carried out in South West Nigeria, there were 13 males and 10 females with a male to female ratio being 1.3:1 who had gut perforations (Chalya et al, 2012; Tade et al, 2011).

In Turkey a case control study was carried out and it was found out that being male predisposed patients to gut perforation (OR=4.39, 95% CI: 1.37. 14.09 and p=0.01) although a specific reason was not determined in correspondence to other studies carried out (Hosoglu et al, 1998).

Another retrospective cohort study was carried out in North Central Nigeria about typhoid gut perforations and it was found that out of 101 patients involved, 66 were males and 35 females which were in agreement with other studies. Ugwu et al (2005) was also in agreement with other studies about more males having gut perforations with a male to female ratio of 1.9:1 out of 101 patients. Another study carried out in India about gut perforations was in agreement of more males than women with a male to female ratio of 11.5:11 out of 100 patients involved (Ugwa et al, 2005; Kharna and Misra, 1984).

In a case control study involving 962 typhoid intestinal perforation patients in Indonesia, sex was highly significant with the risk being limited to being male (OR=1.46, 95% CI=0.44-4.88) (Velema et al, 1997).

Globally, age is also another factor that has been considered concerning gut perforations and according to many researchers it has been a point of interest. According to World Health Organization most of the gut perforation cases were found to be among people aged between 3 and 19 years in Tajikistan (WHO, 2003).

In Indonesia people aged 3 to 19 which accounts for 91% of the cases of gut perforations there per year with over 200,000 deaths. However, rare cases were obtained in some countries with perforations occurring in children aged less than 3 years and this included Bangladesh, India, Jordan and Nigeria (WHO, 2003).

In West African sub region gut perforation is common in the young productive age group with 83% of the patients being less than 35 years of age (Tade et al, 2011). A prospective cohort study which involved 962 patients with gut perforation was done in Indonesia. Of these patients, 37% were aged less than 13 years considering both female and males. For those above 18 years median age was 22 years (OR=1.04, 95% CI=0.99-1.10, $p<0.00001$). (Velema et al, 1997).

According to World Health Organization, in South America gut perforations occur in school students aged 5 to 19 years and in adults aged over 35 years. In North Eastern Tanzania patients with gut perforations ranged from 8 to 76 years with a median of 18.5 years however, the peak was in the 11 to 20 year age group which accounts for 47.1% of the cases obtained (Chalya et al, 2012).

In North Central Nigeria a retrospective cohort study was in agreement with other studies by other authors where they also had cases with gut perforations with a mean age of 19 years. Out of 101 cases 49.5% were children aged under 15 years while 50.5% were adult and 85% of the children affected were aged between 4 to 10 years (Ugwu et al, 2005).

Another case control study also in Nigeria done between 1996 and 2001 was in agreement with that done in 2002 and 2005 where about 50% of the perforations in 189 children were below 15 years and above(Uba et al,2006). Children account for more than 50% of all cases of typhoid gut perforation with an overall rate of 10% and it tends to increase by age and is 30% by the age of 30 years (Emanuel and Francis, 1997).

Marital status is another contributing factor that has been cited to be affecting the prevalence of gut perforations. A case control study carried out found that being single was one of the factors contributing to gut perforations with single people being 6 times risk than the married ones(OR=6.69, 95% CI=2.14,20.9). The main reason was based on the health seeking behaviour when single citing that when alone it is poor compared to when with a companion who can encourage one to go to hospital before the health condition becomes worse in case the patient is suffering from typhoid fever (Velema et al, 1997).

In North Central Tanzania it was found that most of the men who had gut perforations were single emphasizing that men have an increased risk of exposure to typhoid fever yet they have poor health seeking behaviour and end up seeking medical care after getting complications and thus typhoid gut perforations(Chalya et al, 2012). Another reason was that single men spent more time outdoors and thus consumed food from vendors that could lead to contact with causative agents due to improper hygiene leading to perforations (Chalya et al, 2012).

Education is another contributing factor affecting the prevalence of gut perforations. Various studies have shown that gut perforations as a result of typhoid perforation are minimal in the educated. It is believed that it is a public health problem in many developing countries which have many other factors contributing to the perforations compared to the developed countries

where there is good sanitation and available health resource facilities for management (Chalya et al, 2012 and Velema et al, 1997).

In North Central Nigeria it was found that 67% of those with gut perforation had not had either primary or formal education at all and few had had formal education (Ugwu et al, 2005).

According to Center for Disease Control it was also noted that gut perforations affected people who had not had formal education and of which many of them were young adults.

In North Eastern Tanzania out of 1213 patients included in the study of those who had gut perforations 86% of them did not have either primary or secondary education and were coming from rural areas in Tanzania (Chalya et al, 2012).

In contrast other case control studies, it was revealed in Indonesia that those who had formal education and people with University education had 11 times greater risk of acquiring gut perforation and usually they also had good income and could easily access hospitals for early diagnosis(OR=9.51, 95%CI=1.95-45.7, $p<0.00001$) (Velema et al, 1997).

Globally, socio-economic factors carry a lot in the occurrence of gut perforations more commonly in the developing countries and those in the tropics too which have limited medical facilities too.

In East Central Africa, a retrospective cohort study showed that intestinal perforation is reported to be more in people of low socio-economic status and more than 80% were unemployed. Therefore, most of them do not attend medical care services because they do not have medical health insurance and chances are high that these factors can contribute to staying home when sick and no awareness about the disease (Ugwu et al, 2005).

In a retrospective cohort study carried out in North Central Nigeria 78.2% patients with gut perforation were of low socio-economic status, 16.8% were in middle class while 5% were in the upper class (Ugwu et al, 2005).

In contrast, a case control study carried out in Indonesia was not in agreement with other authors about gut perforations being more in people of low economic status(OR=1.58) and for those unemployed,(OR=3.40, 95%CI=1.08-45.7).It however, found out that gut perforations were more in patients that had attained University education(OR=9.51, 95%CI;1.95-45.7), were employed($p<0.00001$) and came from the middle class which was not in agreement with authors like Ugwu et al,2005(Velema et al, 1997).

2.4 Lifestyle and Gut Perforation

In most studies smoking and taking alcohol were considered together because they found out that most people who had perforation of the gut were habitual smokers and regular alcohol drinkers. Experimental studies on effects of smoking on gut perforations were hard to find because it was reported that there was no firm data since it can not be measured accurately and more has to be investigated on how much one smokes to have the effect of gut perforation (Bennette, 1972).

However, a cross-sectional study was carried out concerning the association of smoking and peptic ulcer perforation in Massachusetts and the authors were in agreement about the association being present. It was found that 82% of males with peptic ulcers were smokers. Of these those that had a perforation of the gut were found to be heavy cigarette smokers. In this study it was found that someone smoking and consuming alcohol would also have other characteristics which predispose them to certain diseases (Bennette, 1972).

In a case control study in Malaysia, it was found that smoking and alcohol consumption contributed to gut perforation with 36.07% death. Lifestyle which included alcohol

consumption, excessive cigarette smoking and coffee consumption were studied. Excessive consumption of NSAIDS like aspirin were also found to cause peptic ulcer perforation of the gut. NSAIDS can induce small bowel ulcers that frequently lead to acute bleeding and perforation (Murty et al, 2007).

In another case control study carried out in UK, Western Scotland and Western Norway, most of the ulcer perforations among the subjects less than 75 years of age had a history of smoking. About 1 out of 4 ulcer perforations were attributed to the use of NSAIDS (Cecilie, 2000). A case control study still in UK involved 269 patients who had ingested NSAIDS and had gut perforated peptic ulceration. They were matched with their controls in terms of number, age and sex matched controls for comparison. A highly significant statistical difference was found($p<0.001$)in those aged over 65 years while no statistical difference was found in those aged less than 65 years. There was also a highly statistically significant correlation ($p<0.0001$) between the annual numbers of patients aged over 65 years with perforated peptic ulcers taking NSAIDS. Therefore, increasing age among ulcer perforated patients has been observed especially with the use of NSAIDS (Cecilie, 2000; Gerald and Laurent, 2009; Collier and Pain, 1985).

Population based studies carried out have shown that on any given day 10% to 20% of elderly people grater than 65years have a recent prescription of NSAIDS. In Alberta, Canada 27% elderly people were prescribed NSAIDS. In Tennessee, 40% elderly people received one NSAID prescription annually and 6% had NSAID prescription for greater than 75% of the year. The most significant side effect that these people had was peptic ulcer disease and perforation leading to death in some patients (Marie, 1998).

In USA alone, there are estimated 41,000 hospitalizations and 3300 deaths each year among the elderly that are associated with NSAIDS (Marie, 1998).

In Norway a case control was done on 168 patients with 4469 control from a population based health survey to find the association between ulcer perforation and smoking habits. Current smoking increased the risk for ulcer perforation 10 times more in the age group 15 to 74 years (OR 9.7, 95% CI 5.9 to 15.8, $p<0.001$). The results were similar in men(OR 9.3, 95% CI 4.9 to 17) and women (OR 10.5, 95% CI 4.5 to 25 and duodenal (OR 8.6, 95% CI 4.9 to 15.4) and for gastric (10.5, 95% CI 4.5 to 25) ulcer perforation (Svanes et al, 1997).

In the same case control study in Norway, age and sex were considered in relation to ulcer perforation and smoking, it was estimated to be 9.7 times more common in daily cigarette smokers than in non-smokers (95% CI, 5.9 to 15.8). For those who were smokers the risk of ulcer perforation increased with the number of cigarettes smoked daily ($p<0.001$). No increase in risk for ulcer perforation was found in previous smokers (OR 0.8%, 95% CI 0.2 to 2.2) (Svanes et al, 1997).

2.5 Medical Conditions and Gut Perforation

Medical conditions also have an impact on the prevalence of gut perforation. In USA, the lifetime prevalence of peptic ulcer disease is 12% in men and 10% in women with 15,000 deaths estimated per year as a result of perforated intestines as a complication. A perforated peptic ulcer was studied at the beginning of the twentieth century and it was found to have declined in the last decades in the young and in men. In Western Scotland prevalence was found to be 3%, UK 2% and Western Norway it was 5% and the studies showed fairly similar trends. In men however, the prevalence increased to 12% while in women it was low 4% and fairly stable until 1950 from which it slowly increased to 7% (Cecilie, 2000; Lena and Blomgren, 1997).

In contrast non specific ulcer perforation was reported and that it ranged between 0 to 3% in Japan and China. It was also found that gut perforation was more in developing countries of South East Asia and the Far East (Sanjay and Robin, 2006).

Crohn's disease is another contributing factor that leads to gut perforation. In a study done of 162 patients with Crohn's disease 152 patients had gut perforation as a complication of the disease (Helene et al, 2005).

In Minnesota in 1991, the prevalence rate of Crohn's disease was 133 per 100,000 persons however, since 1980 in the same area the prevalence rate has increased by 46% (Edward et al, 1998).

Perforated colonic diverticular disease is another contributing disease with a considerable morbidity and mortality. Drug and dietary exposure were considered to have biological causes of the perforation. Also NSAIDS were found to cause the colonic diverticular perforations although the exact cause is not known (Moris et al, 2002).

2.6 Health facility factors and Gut perforations

A case control study of patients managed for typhoid intestinal perforation in Nigeria indicated that the patients obtained had to walk very long distances of about 150km on foot before they could board a motorcycle or vehicle from the village to the hospital to attain treatment. Many others could not afford transport fares and had to walk to hospital and they were also not employed. Therefore, by the time they reached hospital they were ill and had to be resuscitated first and in a poor health state. In this study the mortality rate of gut perforation was found to range between 34 to 53% (Uba et al, 2006).

Although physical access to health facilities in Uganda has improved with 82.5% in a study carried out on patients n a Virika hospital in western Uganda 19 patients with gut perforation were found to be living within 5 kilometers of health facility. Also considerable disparities exist regarding the level of expertise to service delivery (Tumusiime, 2010).

A prospective cohort study in western Nigeria was done on 53 patients with typhoid intestinal perforations and it was found that the mean duration of symptoms prior to presentation was 12.5 to 6.3 days with a range of 1 to 30 days. 29(54.4%) patients presented within two weeks

of onset of illness with a mortality of 6.9% and 24 (45.3%) presented after two weeks with 25.0% mortality rate. This did not appear to significantly influence mortality in this study (p=1.061, OR=0.723(0.245-11.023)). Eight patients (15.1%) were operated on in twenty four hours with no recorded deaths while 45 patients (84.9%) were operated after 24 hours and a mortality rate of 17.8% was obtained. The difference was not statistically significant (p=0.572, OR=0.214(0.091-4.132) (Steven et al, 2007).

A combined case control and prospective cohort study was carried out in North western Tanzania and it was discovered that in Sub-Saharan Africa standard medical facilities are not yet readily available and that many communities still fall short of standards for drinking water, hygiene and sanitation. It was also found out that surgery was considered to improve chances of survival of patients with gut perforations most of whom present late and moreover resources in such places are limited. There was also lack of diagnostic facilities and lack of multi-drug resistant strains of Salmonella typhi which resulted in indiscriminate use of antibiotics. It was noted that there lacked enough medical facilities in the remote areas. In this particular study it was also found that inadequate preoperative resuscitation, late presentation, delayed hospitalization and delayed operation affected the prognosis of the disease (Chalya et al, 2012).

A case control study in Nigeria was in agreement with Chalya et al citing that late presentation, poverty and ignorance were major problems in all patients managed for typhoid intestinal perforation in Nigeria. Late presentation was related to poverty and ignorance because poor patients who cannot afford hospital treatment often first resort to native medications thereby wasting valuable time when early diagnosis and adequate treatment in the hospital may influence the outcome of management (Chalya et al, 2012; Na'aya et al, 2004; Adensunkanmi and Ajao, 1997).

In a case control in Turkey, carried out on patients hospitalized with typhoid intestinal perforation inadequate treatment prior to admission (OR=4.58, 95% CI=1.14, 18.35, p=0.03) and short term duration of symptoms (OR=1.32, 95% CI=1.10, 1.35: p=0.001) were found to be significant predictors of perforation (Hosoglu et al, 1998).

CHAPTER THREE

METHODOLOGY

3.1 Introduction

This chapter shows a description of the research design and the methodology used in the study which includes the study design, sources of data, study population, sample size, sampling procedures, study variables, data collection tools, the plan for data analysis, the plan for dissemination, ethical issues and limitations of the study.

3.2 Study Design

The study adopted the community based case- control study design. This design was chosen as the most appropriate because the investigator intended to collect data on history of exposure to risk factors.

3.3 Study area

Kagando hospital is located in Kagando, Kasese District, Rwenzururu sub region, Western Uganda at the foothills of Rwenzori Mountains and close to Queen Elizabeth National Park. It's location is approximately 25 Kilometers, by road, East of Mpondwe at the International boarder with the Democratic Republic of the Congo. Kagando hospital is a rural community hospital, owned and administered by Kagando Rural Development Center (KARUDEC).

The hospital was established in 1965, by the African Inland Missionaries. In the beginning, it treated primarily patients afflicted with leprosy. It has specialty wards which are: Paediatric medical wards, Male medical ward, Female medical ward, Male surgical ward, and Female surgical ward, Maternity, and Leprosy wards. The hospital has 250 beds and averages 30,000 annual outpatient visits and about 18,000 inpatient admissions (enotes, 2012).

3.4 Population

3.4.1 Target Population

All people aged 15 years and above in Kasese district.

3.4.2 Accessible Population

This constituted all gut perforation patients (cases) who received treatment from Kagando hospital and controls that lived in the neighborhood of the case in the community between August and September 2012.

3.4.3 Study Population

All gut perforation patients (cases) and controls (neighbor) aged 15 years and above who consented to participate in this study.

3.4.4 Sources of data

Patients who had a history of gut perforation. Information was also got from controls who did not have a history of gut perforation.

3.5 Inclusion and Exclusion Criteria

3.5.1 Cases

The cases admitted in the wards or discharged but still within the hospital that was interviewed could not make up the sample size. I identified more cases from the hospital records that had been discharged and followed them to their homes. However, those who were deaf and dumb, those who refused to be interviewed, and those who were mentally ill would be excluded from the sample.

3.5.2 Controls

Neighbors to the cases living in the same environment not suffering or having suffered from gut perforations aged 15 years and above were interviewed and included in the sample. From these those who were dumb, deaf or mentally ill were excluded from the sample.

3.6 Sample size calculation

The sample size is calculated using the Schelssman formula below, (1982)

$$n = \left(\frac{r+1}{r}\right) \frac{\left[(\bar{p})(1-\bar{p})\right] (Z\beta + Z\alpha/2)}{(P_1-P_2)^2}$$

Where; n is the required sample size.

r is the ratio of controls to cases(r=1 if equal number of cases and controls)

$\bar{p}$ = is the measure of variability

$(P_1-P_2)^2$ is Effect size (difference in proportions)

$Z\beta$ is desired power=0.84 for 80% power

$Z\alpha/2$ is level of statistical significance which is 1.96

P_1=proportion of cases exposed (smokers)

P_2= proportion of controls exposed (non smokers)

OR= Odds ratio

$$P_1 = \frac{ORP_2}{P_2(OR-1)+1}$$

$\bar{p} = 0.5(P_1+P_2)$

P_2 = 42% (0.42), OR=5 (Svanes, 1997)

$$P_1 = \frac{(5x0.42)}{0.42(5-1)+1} = \frac{2.1}{2.68} = 0.784$$

$\bar{p} = 0.5(0.42+0.784) = 0.602$

$$n = \frac{2x\,(0.602)\,(1-0.602)\,(0.84+1.96)^2}{(0.42-0.602)^2}$$

$$n = \frac{3.757}{0.0331} = 113.5$$

Therefore n=113.5 approximately 114

Cases = 57 Controls = 57

3.6.1 Sampling Technique

Convenience sampling method was used. All people for as long as they fell in the inclusion criteria were interviewed until the required sample size was attained.

3.6.2 Study variables

Independent Variables

The independent variables in the study were;

- Socio-demographic factors (Age, sex, marital status, education, occupation, income)
- Lifestyle (Alcohol, Smoking, Excessive use of NSAIDS).
- History of some medical conditions (Peptic Ulcers Disease,Typhoid fever, Chrons disease, Colonic diverticular disease).
- Health facility factors (accessibility, attitude of health workers, availability of drugs, and availability of health workers).

Dependent variable

The dependent variable is the occurrence of gut perforation.

3.7 Data collection methods

Data was collected using structured researcher administered questionnaires. Two research assistants were trained and they collected data from different sub-counties. Cases were got by identifying them from the hospital records and then following them up to their homes. For each case interviewed we got a neighbor as a control who did not have a history of gut perforation.

3.8 The Questionnaire

The questionnaire had a title and identification number. It was a structured questionnaire consisting of both open and close ended questions. The questionnaire was meant to get information regarding the history of factors associated with gut perforation. This tool was pre-tested in a near by health center where 6 cases and 6 controls were interviewed. The pre-testing was done to improve clarity of the questionnaire so as to minimize information bias.

3.9 Data Management

The researcher trained two research assistants and provided a comprehensive overview about the topic under study. These assisted in the research, especially in data collection process whereby, the questionnaires were first pre-tested in Nyabirongo health center. And thereafter, data collection in Kagando Hospital was carried out. The questionnaires were checked for completeness and accuracy, and then the data was analyzed.

10.0 Plan for Data Analysis

The researcher used tables to show the statistics and the relationship between the study variables. The relationships between factors associated with gut perforation were determined by description both at bi-variate and multivariate analysis. The strength of association was determined by Odds ratio and precision around the odds ratio was estimated by 95% CI. P-values were generated and used to determine significance at $\alpha=0.05$. Information was double entered in Epi-Data to ensure accuracy during analysis.

3.11. Plan for Dissemination.

The results from the study will be presented to International Health Sciences University, shared with Bwera hospital and Kilembe hospitals which are likely to get patients with the same condition.

3.12. Ethical Issues.

Before any data collection proceedings, approval was sought from the International health sciences university school of Nursing and Kagando hospital. Following an informed consent, the respondents signed a consent form, they were also assured of confidentiality, and that there would be no offense to any respondent who was not interested in being interviewed because it is a human right that is ought to be respected.

3.13. Limitations of the Study.

The study was limited to Kagando hospital only which is a small population and thus, the findings may not be generalized.

CHAPTER FOUR

PRESENTATION, AND INTEPRETATION OF FINDINGS

4.1 Introduction

This study represents the findings of 114 respondents. The study aimed at investigating the factors associated with gut perforation among patients who had been admitted in the surgical ward of Kagando hospital, Kasese district.

Descriptive analysis

The total number of respondents was 114.

4.2 Socio-demographic characteristic of respondents:

Most, 58/114 (50.9%) of the respondents were equal or less than 21 years. The proportion of those who were less or equal to 21 years of age that were cases was 45.6% (26/57). The proportion of those less or equal to 21 years of age who were controls was 56.1% (32/57). There was no statistical difference between those aged less or equal to 21 years and those who were 21 years or more, in regard to gut perforation (χ^2=1.26, P=0.261).

The majority, 62/114 (54.4%) of the respondents were males. The proportion of males who were cases was 63.2% (36/57). The proportion of males who were controls was 45.5% (26/57). There was no statistically significant difference between males and females in regard to gut perforation (χ^2=3.54, P=0.09).

More, 53/114 (46.5%) of the respondents were Protestants. The proportion of Protestants who were cases was 42.1% (24/57). The proportion of Protestants who were controls was 50.9% (29/57). There was no significant association among Protestants, Catholics, Muslims and other religions in regard to gut perforation (χ^2=1.25, P=0.774).

More than half, 77/114 (67.5%) of the respondents were single. The proportion of singles who were cases was 63.2% (36/57) compared to 71.9% (41/57) who were controls. There

was no statistically significant difference between singles and those that were married, separated or widowed in regard to gut perforation (χ^2=7.46, P=0.055).

Almost half, 50/114 (43.9%) of the respondents had attained primary education. The proportion of those that had attained primary education and was cases was 40.4% (23/57). The proportion of those that had attained primary education and were controls was 47.4% (27/57).There was no significant association amongst those that had no education, primary, secondary or secondary education in regard to gut perforation (χ^2=1.23, P=0.746).

Most, 77/114 (67.5) of the participants were unemployed. The proportion of the unemployed who were cases was 61.4% (35/57). The proportion of those unemployed who were controls was 73.7% (42/57). No statistically significant difference was found between those employed and unemployed in regards to gut perforation (χ^2=1.96, P=0.766).

Most, 104/114 (91.2%) of the participants spent less or equal to 2500 Uganda shillings (approximately 1 US $) on a daily basis. The proportion of these who were cases was 89.5% (51/57). The proportion of those spending less than 2500 US dollars on a daily basis was 92.9% (53/57).

The majority, 14 (12.3) of the respondents were farmers. The proportion of farmers who were cases was 10.5% (6/57). The proportion of farmers who were controls was 14% (8/57). Farming and other occupations were not significant predictors of gut perforation (χ^2=4.74, P=0.535) as shown in Table 1 below.

Table 1: Bivariate analysis of socio-demographic factors influencing gut perforation

Variable	N (%)	Case	Control	χ^2	P-value
Age					
≤21 years	58 (50.9)	26 (45.6)	32 (56.1)	1.26	0.261
≥22 years	56 (49.1)	31 (54.4)	25 (43.9)		
Gender					
Male	62 (54.4)	36 (63.2)	26 (45.6)	3.54	0.090
Female	52 (45.6)	21 (36.8)	31 (54.4)		
Religion					
Protestant	53 (46.5)	24 (42.1)	29 (50.9)	1.25	0.774
Catholic	46 (40.4)	24 (42.1)	22 (38.6)		
Muslim	13 (11.4)	8 (14.0)	5 (8.8)		
Others	2 (1.8)	1 (1.8)	1 (1.8)		
Marital status					
Single	77 (67.5)	36 (63.2)	41 (71.9)	7.46	0.055
Married	30 (26.3)	20 (35.1)	10 (17.5)		
Separated/divorced	5 (4.4)	1 (1.8)	4 (7.0)		
Widow/widower	2 (1.8)	0 (0.0)	2 (3.5)		
Education level					
None	20 (17.5)	12 (21.1)	8 (14.0)		
Primary	50 (43.9)	23 (40.4)	27 (47.4)	1.23	0.746
Secondary	31 (27.2)	15 (26.3)	16 (28.1)		
Tertiary	13 (11.4)	7 (12.3)	6 (10.5)		
Employment status					
Employed	37 (32.5)	22 (38.6)	15 (26.3)		
Unemployed	77 (67.5)	35 (61.4)	42 (73.7)	1.96	0.766
Expenditure/day					
≤2500/=	104 (91.2)	51 (89.5)	53 (92.9)	0.44	0.742
>2500/=	10 (8.8)	6 (10.5)	4 (7.0)		
Occupation					
Farmer	14 (12.3)	6 (10.5)	8 (14.0)	4.74	0.335
Business	12 (10.5)	9 (15.8)	9 (5.3)		
Teacher	4 (3.5)	2 (3.5)	2 (3.5)		
Builder	4 (3.5)	3 (5.3)	1 (1.8)		
Others *	80 (70.2)	37 (64.9)	43 (75.4)		

* Student, house wife, jobless

4.3 Lifestyle factors and gut perforation:

Few, 5/114 (4.8%) of the participants had ever smoked. The proportion of smokers who were cases was 5.9% (3/51). The proportion of smokers who were controls was 96.3% (52/54). Less than half, 27/114 (29.7%) had ever consumed alcohol. The proportion of those who consumed alcohol that were cases was 25.0% (11/44). The proportion of those who ever consumed alcohol who were controls was 34.0% (16/47). Few, 28/114 (29.7) of the respondents had a prolonged use of pain relievers. The proportion of prolonged pain relief users who were cases was 22.8% (13/57). The proportion of prolonged pain relief users who were controls was 26.3% (15/57).There was no statistically significant difference for all the health facility factors in regard to gut perforation as shown in Table 2.

Table 2: Bivariate analysis of life style factors influencing gut perforation

Variable	N (%)	Case	Control	χ^2	P-value
Ever smoked cigarettes					
Yes	5 (4.8)	3 (5.9)	2 (3.7)	0.275	0.600
No	100 (95.2)	48 (94.1)	52 (96.3)		
Ever consumed alcohol					
Yes	27 (29.7)	11 (25.0)	16(34.0)	0.272	0.602
No	64 (70.3)	33 (75)	31 (65.9)		
Prolonged use of pain reliever					
Yes	28 (24.6)	13 (22.8)	15 (26.3)	0.189	0.663
No	86 (75.4)	44 (77.2)	42 (73.7)		
Boiling drinking water					
Yes					
No	49 (42.9)	26 (45.6)	23 (40.4)	0.322	0.570
	65 (57.0)	31 (54.4)	34 (59.7)		

4.4 Medical Conditions and Gut Perforation:

More than half, 70/114 (61.4%) of the respondents had a history of typhoid fever. The proportion of respondents with this history who were cases was 82.5% (47/57). The proportion of respondents with a history of typhoid fever who were controls was 40.4% (23/57). There was a statistically significant association between typhoid fever and disease like peptic ulcer, Crohn's disease and other diseases (χ^2=24.756, P<0.001) as shown in Table 3.

Table 3: Bivariate analysis of common diseases associated with gut perforation

Variable	N (%)	Case	Control	χ^2	P-value
Diseases					
Typhoid fever	70 (61.4)	47 (82.5)	23 (40.4)	24.756	<0.001
Peptic ulcer disease	20 (17.5)	7 (12.3)	13 (22.8)		
Crohn's disease	2 (1.8)	1 (1.8)	1 (1.8)		
Others *	22 (19.3)	2 (3.5)	20 (35.1)		

*Intestinal obstruction

4.5 Health facility factors and gut perforations:

About, 32/114 (28.1%) of the respondents said the attitude of health workers was very good. The proportion of those who were cases was 31.6(18/65). The proportion of those who said health worker attitudes were very good and were controls was 24.6% (14/57).

Few, 30/114 (26.3%) of the participants resided in a distance of about 5KM from the health center or hospital. The proportion of these who were cases was 26.3% (15/57). The proportion of these who were controls was 26.3% (15/57).

More, 64/114 (56.1%) of the respondents agreed that the health workers were available at work. Of these the proportion of cases was 50.9% (29/57). The proportion of those that agreed about the availability of health workers was 61.4% (35/57).

More than half, 72/114 (63.2) of the participants agreed to having enough time with the health workers. The proportion of those that agreed who were cases was 52.6% (30/57). The proportion of participants that agreed about having enough time with health workers who were controls was 73.7% (42/57). There was a statistically significant difference between health workers having enough time for patients and not having it (χ^2=5.428, P=0.020).

The majority, 64/114 (56.1%) of respondents got their supplies from hospital. The proportion of those who agreed to availability of supplies who were cases was 50.9% (29/57). The proportion of those that agreed to availability of supplies who were controls was 61.4% (35/57).

The majority of health facility factors were not statistically significant predictors in regard to gut perforation as shown in Table 4.

Table 4: Bivariate analysis of health facility factors influencing gut perforation

Variable	N (%)	Case	Control	χ^2	P-value
Attitudes of health workers					
Very good	32 (28.1)	18 (31.6)	14 (24.6)	4.651	0.199
Good	65 (57.0)	28 (49.1)	37 (64.9)		
Bad	14 (12.3)	10 (17.5)	4 (7.0)		
Very bad	3 (2.6)	1 (1.8)	2 (3.5)		
Distance					
≤5 Km	30 (26.3)	15 (26.3)	15 (26.3)	0.198	0.970
About 5 Km	34 (29.8)	16 (28.1)	18 (31.6)		
>5 Km	50 (43.9)	26 (45.6)	24 (42.1)		
Health workers available					
Agree	64 (56.1)	29 (50.9)	35 (61.4)	2.078	0.532
Strongly agree	50 (43.9)	28 (49.1)	22 (38.6)		
Disagree	25 (21.9)	15 (26.3)	10 (17.5)		
Strongly disagree	4 (3.5)	2 (3.5)	2 (3.5)		
Enough time for patient					
Yes	72 (63.2)	30 (52.6)	42 (73.7)	5.428	0.020
No	42 (36.8)	27 (47.4)	15 (26.3)		
Availability of supplies					
Yes	64 (56.1)	29 (50.9)	35 (61.4)	1.283	0.345
No	50 (43.9)	28 (49.1)	22 (38.6)		

Multivariate Analysis of factors associated with gut perforation.

In multivariate analysis, being male and having a history of typhoid fever were found to be significant predictors of gut perforation.

The male respondents were 3 times more likely to develop gut perforations than females (OR=3.02, CI=1.10-8.28, P=0.031).

Respondents with a history of typhoid fever were 30 times more likely to develop gut perforation than those with a history of other diseases (OR=29.88, CI=3.58-249, P=0.002) as shown in Table 5.

Table 5: Multivariate analysis of factors associated with Gut perforation

Variable	N (%)	OR (95%CI)	P-value
Gender			
Male	62 (54.4)	3.02 (1.10-8.28)	0.031
Female	52 (45.6)	1	
Disease			
Typhoid fever	70 (61.4)	29.88 (3.58-249)	0.002
Others *	22 (19.3)	1	

* Crohn's, peptic ulcer, Diverticulitis

CHAPTER FIVE

DISCUSSION AND SIGNIFICANCE OF STUDY

5.1 Introduction

This chapter discusses the research findings and conclusions basing on the specific objectives of the study. In this chapter, the researcher compares findings of the study with findings of various scholars cited in the literature review who carried out research on a similar topic in different areas.

5.2 Socio-demographic factors

This community-based case control study found out that the age group of less or equal to 21 years was affected most by gut perforation. This is probably because people in this age group eat around no matter the hygiene, prefer buying food from vendors who sell at affordable prices and also stay outdoors for long. This was also consistent with previous studies done by Steven et al, 2007 in North western Nigeria, Na'aya and Chama, 2004 also in Nigeria, Chalya et al, 2006-2011 in Tanzania and Ugwu et al, 2005 in Central Nigeria. A previous study by Hosoglu et al, 2004 in Turkey was also in agreement with the previously mentioned scholars. Consistent with other studies elsewhere, males are more at risk of developing gut perforation than females. A study by Chalya et al, 2012, found that 72.1% of gut perforation patients were male. Similarly, studies by Ugwu et al, 2005 in a study North Central Nigeria, Velema et al, 1997 in a prospective cohort study in Indonesia and Hosoglu et al, 1998 in Turkey are in agreement with the fact that are more at risk of developing gut perforation than females.

An exact reason may not be known however; it could be due to the fact that since men in this study were home heads they had to spend more time out and end up taking food and drinking water from wherever they would be not taking precaution like drinking boiled water and eating from clean utensils. This exposes men to frequent contact with typhoid fever causative

agent therefore there should be health education about the need to drink boiled water no matter the gender involved as a preventive measure against typhoid fever. There is a negative implication of males dying of gut perforation the fact that they are family heads and bread winners. There will be more orphans and challenges of meeting basic needs.

Although, no significant relationship was found between marital status and gut perforation in this study, previous studies elsewhere have found such relationship (Velema et al, 1997 and Chalya et al, 2012). Their difference could have arisen from difference in study locations.

Majority of the respondents in this study had attained some education, with 43.9% at least attaining primary education. This therefore probably means that the majority are unable to internalize health education message regarding prevention of gut perforation. However, this study did not find educational level to be a predictor of gut perforation. This was contrary to what was revealed in Indonesia by Velema et al, 1997. Where they found that those who had formal education and people with University education had 11 times greater risk of acquiring gut perforation. The explanation for such a difference is because it was a hospital-based case control study and the difference in sample size.

Expenditure per day by participants was used to estimate the income (economic status) and about nine in ten of respondents were living below poverty line. Although the level of poverty was high among this population there was no statistically significant association between expenditure per day and gut perforation. However, previous studies by Ugwu et al, 2005 and Velema et al, 1997 found that socio-economic status was associated with gut perforation. This is because it is likely for one to easily go for health care if they are financially stable, will have fuel to boil drinking water and in case of any form of illness they will go to the nearest health provider for further management other than waiting till the condition is worse when they have no income at all. Therefore, even when people are of a

low socio-economic status they should access the available health facilities such that diseases like typhoid fever can be treated early to curb it's complication of gut perforation.

5.3 Lifestyle factors

Findings from this study did not confirm the association of smoking, alcohol consumption and prolonged use of NSAIDS with gut perforation. This is because it is difficult to get experimental information in regard to the effects caused by these lifestyle factors on one's health. Moris et al, 2002 found that it was difficult to measure accurately the effect of smoking on gut perforation and how much one had to smoke for the perforation to occur. However, Mahid et al, 2005 found that active tobacco exposure was associated with a late diagnosis of gut perforation and Moris et al, 2002 concluded that NSAIDS had some biological causes of gut perforation although the main causes remain unknown.

5.4 Medical conditions

Typhoid fever was significantly associated with gut perforation in Kagando hospital which was in agreement with other studies. Typhoid fever is a global health problem with a literature review of approximately 17 million people being affected annually by the World Health Organization (WHO, 2003).Typhoid fever has a very high socio-economic impact on people once they are hospitalized or even when home. The costs that come with hospitalization are so scaring that most people tend to stay home and only go to hospital when the disease has progressed and complication has occurred with a belief that the money paid will be worth the treatment. With this trend and mindset it was the main reason found in this study while other studies base it on people occupying tropical areas hence the disease (Jhobta et al, 2006; Chalya et al, 2012: Neil et al, 2009). Typhoid fever being a public health problem in developing countries which have challenges in health facility medical resources, poor sanitation and limited clean water is highly attributed to the typhoid disease burden

leading to complication to gut perforation. Therefore, community health education is necessary as a preventive measure against typhoid fever. This study found typhoid fever to be one of the main predictors of gut perforation among patients of Kagando hospital at multivariate analysis. This finding is in line with (Chalya et al, 2012, Neil et al 2009, Tade et al, 2011, Uba et al, 2006, Na'alya et al, 2004 and Meier et al, 1998).

5.5 Health facility factors

In this study health facility factors were not significantly associated with gut perforation although 28.1% of the participants said the attitude of health workers was very good, distance to the health centers with majority being 5KM away from their homes, respondents saying health workers were available and boiling drinking water means other factors not assessed must have been responsible for gut perforation. According to Na'aya et al, 2004; Adensunkanmi and Ajao, 1997 distance affected time of arrival on presentation with typhoid fever to hospital. A person far away from the hospital is most likely to sit back home and wait until he or she very sick to seek medical care. However, no specific studies have been done to find the relationship between health facility factors and gut perforation.

Methodological Issues

Most variables were not significantly associated for instance the sample size could have been low. Since we got controls from the community we could not ascertain how long they had stayed in the area. Selection bias and information bias could have occurred. The questionnaire was not translated in the local language. The results of this study can only be generalized to the population in Kagando.

CHAPTER SIX

CONCLUSION AND RECOMMENDATION

6.1 Introduction

This chapter presents the researcher's final conclusions and recommendation based on the discussion and findings of the study.

6.2 Conclusions

- The research revealed that gut perforation in Kagando hospital-Kasese district was associated with typhoid fever and male gender.
- The research found that common medical conditions were not associated with gut perforation among patients in Kagando hospital.
- Health facility factors were not associated with gut perforation among patients of Kagando hospital.
- Lifestyle factors were not associated with gut perforation among patients in Kagando hospital.

6.3 Recommendations

- The District Health Officer needs to put more emphasis on Health education, sanitation and early health seeking behavior to avoid complication of disease in the community by empowering community health workers and village health teams to sensitize communities. Health education programs on sanitation can be done using local radio stations, village drama groups and other Information education and Communication materials like posters.

  Useful health interventions would include:

- ✓ Washing hands after visiting the toilet
- ✓ Education to the community about transmission routes, symptoms and effective hand

washing particularly after using the toilet and before preparation or eating food.

- ✓ Symptomatic household members should be encouraged to seek medical attention.
- ✓ Hospitalized patients should be cared for using standard precautions.
- ✓ Drinking boiled water in clean utensils should be considered.
- ✓ Raw vegetables or fruits should be washed with clean water and hands should be washed with soap and water before handling them.
- ✓ Avoid foods and beverages from street vendors. This is because it is difficult for food to be kept clean on the street.

- A quantitative study should be done and the respondents should be matched to find out more information regarding gut perforation.

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Appendices
Appendix I: Study Questionnaire

A QUESTIONNAIRE FOR THE FACTORS AFFECTING THE PREVALENCE OF GUT PERFORATION IN KAGANDO HOSPITAL, KASESE DISTRICT

Questionnaire No.....

Introduction.

My name is MASIKA JESSICA a student at International Health Sciences University, conducting a study on the factors affecting the prevalence of gut perforation in Kagando hospital in Kasese district.

The information that you will provide is very important and is basically for academic purposes, and it will also be used to improve and update the current information about gut perforations. You are assured of total confidentiality and results of the study shall identify you any where so feel free and be objective while filling in this questionnaire.

Mobile no.: 0773651668

Researcher's Signature.....

For the respondent.

I have ascertained my consent to be interviewed by this student carrying out the above mentioned study. I have been assured of total confidentiality, and that the results of this study shall not identify me anywhere in anyway since my name is not needed and it shall not appear anywhere in this questionnaire. And in any-case, my refusal to answer any questions shall not affect me or any member of my family.

Respondent's Signature.....

Instructions;

Please read the questions carefully and answer them accordingly and appropriately.
Tick the most appropriate answer in the box provided on the left side.
Make sure all questions are answered, if applicable.

SECTION A: SOCIO-DEMOGRAPHIC FACTORS

1. How old are you? ….....
2. What is your current religion?
   1. ☐ **Anglican/Protestant**
   2. ☐ **Roman catholic**
   3. ☐ Muslim
   4. ☐ Others (please specify).....
3. What is your current marital status?
   1. ☐ Single.

2. ☐ Married / Cohabiting
3. ☐ Separated / Divorced
4. ☐ **Widow/widower**

4. What is your highest level of education attained?
   1. ☐ None
   2. ☐ Primary
   3. ☐ **Secondary**
   4. ☐ Tertiary
5. What is your employment status?
   1. ☐ **Employed**
   2. ☐ **Unemployed**
6. How much do you spend in a day?
   1. ☐ **2500 shillings**
   2. ☐ **> 2500 shillings**
7. What is your current occupation?
   1. ☐ **Farmer**
   2. ☐ **Business man/woman**
   3. ☐ **Teacher**
   4. ☐ **Builder**
   5. ☐ Others (please specify).....

SECTION B- GASTROINTESTINAL DISEASES

8. Have you ever suffered from any of the following gastrointestinal diseases?
   1. ☐ **Typhoid fever**
   2. ☐ **Peptic ulcer disease**
   3. ☐ **Crohn's disease**
   4. ☐ **Diverticulitis**
   5. ☐ **Others (Specify).....**

SECTION C: LIFESTYLE FACTORS

9. Do you currently smoke?
   1. ☐ **Yes (If yes, answer question 10)**
   2. ☐ No (If no, answer question 11)

10. If yes to question 9, how many cigarettes do you smoke in a day?
    1. ☐ 1-9 cigarettes daily
    2. ☐ **10-19 cigarettes daily**
    3. ☐ 20 cigarettes daily

11. If no, have you ever smoked?
    1. ☐ **Yes**
    2. ☐ **No**

12. Do you consume alcohol? (If no please skip to question 14)

1. ☐ **Yes**

2. ☐ **No**

13. If yes, how much do you consume?

1, ☐ **1-5 bottles daily**

2. ☐ **6-10 bottles daily**

3. ☐ **≥ 11 bottles daily**

14. If no, have you ever consumed alcohol?

1. ☐ **Yes**

2. ☐ **No**

15. Have you been using pain killers for a long period time?

1. ☐ **Yes**

2. ☐ No

16. If yes, name the pain killers.

1.....

2. Others ….....

17. If yes, how often do you use the pain killers?

1. ☐ Once a day

2. ☐ Twice daily

3. ☐ Three times daily

4. ☐ > Three times a day

SECTION D: HEALTH FACILITY FACTORS

18. How far is it from your home to the hospital?

1. ☐ < 5 Kilometer

2. ☐ About 5 Kilometers

3. ☐ > 5 Kilometers

19. What do think about the way health workers behave towards patients?

1. Very good

2. Good
3. Bad
4. Very bad

20. According to you, do you think there are enough health workers to get all patients worked on?

1. ☐ Agree
2. ☐ Strongly agree
3. ☐ Disagree
4. ☐ Strongly disagree

21. Is there enough time to discuss patient care with a health worker?

1. ☐ Yes
2. ☐ No

22. Do you get drugs and other supplies from the hospital?

1. ☐ Yes
2. ☐ No

23. Where do you get drinking water from?

1. ☐ Tap/ Bore-hole
2. ☐ Stream
3. ☐ River
4. ☐ Spring

24. Do you boil drinking water?

1. ☐ Yes
2. ☐ No

Thank you so much for your response and time. Your cooperation and effort are highly appreciated.