

The Epidemiology Profile of Hysterectomy in Northern Zimbabwean Women

ANDILE SICOLIWE THAKA (✉ andilethaka@gmail.com)

Africa University

Research Article

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Abstract

Hysterectomy is a procedure commonly performed to treat uterine and cervical disorders. It is a common procedure in developing countries, others listing it as the most common gynecological procedure in developed countries. The aim of the study is to determine the epidemiology profile of hysterectomy in Northern Zimbabwean women. It can either be classified according to the procedure used to perform the hysterectomy; which could be a total abdominal hysterectomy, uterus only, subtotal hysterectomy, total abdominal hysterectomy plus salpingo-oophorectomy, total abdominal hysterectomy plus bisalpingo-oophorectomy and radical hysterectomy. It can be vaginally, abdominally or laparoscopy assisted. Laparoscopy assisted vaginal hysterectomy is less common as the procedure is semi-automated. The aim of the study was to determine the prevalence of hysterectomy among the women in northern Zimbabwe, identifying patterns of occurrences and distribution of hysterectomy and determining possible indicators of hysterectomy. Parirenyatwa Group of Hospitals undertakes Histology laboratory testing of samples from hospitals in Northern Zimbabwe as the referral laboratory. A retrospective study was conducted using the census sampling method to determine the epidemiology profile of hysterectomy. The study collected 350 reports from 2019 that indicated to have been from hysterectomy and therefore the estimated prevalence rate of hysterectomy was 9.81%. The study looked at the reports of specimens brought in due to the performance of hysterectomy. The inclusion criteria of a report was a complete histology report from the Pathologist from specimens processed and microscopy slides prepared by the Scientist. Exclusion criteria was an incomplete report. Leiomyomata, post-partum hemorrhaging and chronic pelvic pain were the leading possible indicators of hysterectomy. The procedure was most commonly performed on women between the ages of 41-50 years. The total abdominal hysterectomy was 59.81% performed most of the time with most reports from Parirenyatwa Group of Hospitals and then Mutare Provincial Hospital. Delimitations was the low resource costing of the study and the automated collection of the data. The limitations were clerical errors, lack of patient data such as clinical history and lack of history or socio-economic demographics collected by the laboratory form. There is need for better data management and increase in the variation of data to collect such as clinical history, parity, marital status, income setting and other factors. Further studies can be done to give a holistic picture of the epidemiology profile of hysterectomy in Zimbabwe. There is need for an awareness campaign on hysterectomy as it is a growing common procedure among women in developing countries. Case studies would give intrinsic details unavailable in reports. Better Sexual and reproductive health information should be availed on indicators of hysterectomy according to their prevalence in different age groups.

Introduction

Introduction

Hysterectomy is a surgical procedure to remove a woman's uterus (Stang, 2016). It is a non-pregnancy related procedure carried out to treat health problems that can occur within the female reproductive system. The reproductive system is made up of the uterus (womb), cervix, vagina, fallopian tubes and the ovaries and for some conditions, the fallopian tubes and ovaries and other surrounding structures could be removed as well. The procedure is usually performed by a gynecologist and is important in women that are at risk of uterine and cervical diseases.

Eight-nine point six percent of women who had had a hysterectomy performed between the ages of 15-44 years of age between 2011-2015 listed medical reasons as the main reason of having the procedure in the United States of

America. (Key Statistics from the National Survey of Family Growth, 2017). In 2018, the proportion of women below 40 years who have had a hysterectomy was 22% in Andhra Pradesh and 20.1% in Telangana, India (Kohli, 2018). Experts raised concern in India and have introduced incentives to both public and private doctors and institutions to curb the incidence of hysterectomy among women. This is synonymous with levels of alarm in USA prompting hysterectomy prevalence and incidence studies across India and globally.

Study Background

Hysterectomy is acknowledged as a leading reason for health insurance use in low income women in India. (Desai S. O., 2016). The study in Gujarat, India reveals that there is limited population-level data to inform policy reports on the incidence and determinants of hysterectomy although the study allows for its epidemiology findings to reveal advanced informative obstetrics views. "Hysterectomy is the second most common surgery performed on reproductive-age women in the U.S., after cesarean section. More than 400 000 hysterectomies are performed in the U.S. each year with nearly 68 percent done for benign conditions that involve abnormal uterine bleeding, uterine fibroids and endometriosis." (Mostafavi, 2018)

In Conakry, Guinea a study is carried out on the epidemiology profile and complications of hysterectomy in a university hospital setting between January 2010 and January 2018. Different countries carried out studies at university hospitals during that time period. Cameroon obtained a frequency of 4.4%, 6.6% in the Democratic Republic of Congo (DRC), 2.54% in Bamako Mali, and 0.53% in Burundi, 0.45% in Senegal, 0.07% for Gabon and 0.11% in Nigeria (Ngaroua, 2019). The above studies were done at university hospitals and then used to characterize other hospital profiles with respect to frequency, socio-demographics of patients and clinical profiles. It also revealed the risk factors for hysterectomy and their respective frequencies (Ngaroua, 2019).

China acknowledges hysterectomy as one of the most common surgical procedures performed on women also highlighting how little is known of the procedure in low to middle income regions. The study conducted an epidemiology profile in Anyang, China in 2009 that evaluated the prevalence of hysterectomy and its risk factors in rural China. Evaluation of the risk factors created a linkage between the procedure and the factors considered as potential causes. China listed obesity and history of pregnancy loss as high risk determinants of hysterectomy (Fangfang, 2017).

Similarly, a study on the factors associated with hysterectomy among women in Australia is cite and used to further research a population based study that covers 23 years in Western Australia (Byles, 2000). The study identified the prevalence of hysterectomy and used it quantitative findings to separate geographic variation from the effects of socio-demographic influence on hysterectomy. However, a study on the regional variation of hysterectomy for benign uterine diseases in Switzerland assesses the relationship between hysterectomy and regional variation and further explores potential determinants of the variation. (Nina Stoller, 2020). Switzerland did this by conducting a retrospective health surveillance on hysterectomy.

A cross sectional study to determine the outcome of vaginal hysterectomies done at Kapenguria Count Hospital in West Pokot County, Northern Kenya looked at vaginal hysterectomy and highlight it's use as a primary approach in managing benign gynecological conditions. (A Wameyo, 2016). It will promote the use of hysterectomy as treatment for many other uterine diseases besides cancer.

If the procedure is gynecological common as the USA, Australia, China and India claim, there is a need to evaluate and determine its prevalence among the women in Northern Zimbabwe. Previous studies provided baseline information that typified the profile for the respective countries depending on the variables assessed. It will also allow further studies on hysterectomy, related gynecologic and reproductive studies revealing the importance of an epidemiology profile of hysterectomy in Northern Zimbabwe.

Problem Statement

Hysterectomy studies in developed countries such as Australia have allowed for the determination of hysterectomy prevalence levels across varying geographical regions and the exploration of possible predominant risk factors/determinants of hysterectomy. From 2000-2001 and 2013-2014, Australia conducted hysterectomy trends analysis which concluded the decline of hysterectomy rates for women above 25 years from 65.4 per 10 000 women to 47.1, an annual decrease of 3% within the entire period (Wilson, 2017). Hysterectomy trends were used to determine its frequency and relationship between variables assessed against the procedure which the study used to reveal accessibility of surgery alternatives, pharmacological treatments, and cost or access issues as factors of the hysterectomy decline and stable rates. Unfortunately, no evidence of university hospital studies and/or population level data is available locally or regionally on the epidemiology profile of hysterectomy highlighting the lack of baseline information of hysterectomy studies. A knowledge gap exists on independent hysterectomy studies in Southern Africa, specifically Zimbabwe even though there is evidence that hysterectomy has been performed over the years.

Research Objectives

Broad Objective

The aim of this study is to evaluate the epidemiology aspects of hysterectomy among women living in Northern Zimbabwe.

Specific Objectives

This research seeks to;

1. Determine frequency and distribution of hysterectomy in women living in the Northern part of Zimbabwe
2. Identify patterns in occurrences of among women who have had hysterectomy performed in Northern Zimbabwe in 2019
3. Identify possible direct determinants of hysterectomy among women in Northern Zimbabwe

Research Questions

1. What is the frequency and distribution of hysterectomy in women living in the Northern part of Zimbabwe?

2. Which are the patterns in occurrences among women who have had hysterectomy performed in Northern Zimbabwe in 2019?
3. What are the possible direct determinants of hysterectomy among women in Northern Zimbabwe?

Significance of the study/ Justification of study

Hysterectomy helps to treat and prevent uterine and cervical diseases. The epidemiology profile of hysterectomy in Northern Zimbabwe will provide statistical data and supporting material on hysterectomy frequency against the variables that will be studied in the research. The study will allow for case assessments on alternatives to hysterectomy considering the procedure is irreversible. It will provide the population, with a focus on women, in Zimbabwe with relatable preventative and health management information on hysterectomy. It sometimes affects the hormonal balance and so pharmaceutical or other surgical options can be explored as alternative methods of treatment.

Surgeons will be able to further research on surgical techniques of hysterectomy and disease management. This will allow surgeons to decide on the best method in treating or managing uterine and cervical diseases. It also will allow for policy reviews on the algorithm used in deciding on hysterectomy as a line of treatment. Laboratory testing can be improved with the suggestion of relevant tests for specific diseases common in hysterectomy patients. This will reinforce the importance of data capturing, patient history and clinical data for further studies on disease progression and management before the procedure.

Statistical significance of hysterectomy can be used to determine the effectiveness of hysterectomy in treating and managing disease in women. The profile will reflect the burden women carry of uterine and menstrual diseases allowing for intervention methods targeting the most vulnerable groups. The vulnerable groups will show hysterectomy patterns that may be associated with significant socioeconomic and personal health consequences pre- and post-procedure.

Study Limitations

The limitations of the study are those characteristics of design or methodology that impacted or influenced the interpretation of the findings from your research (Price, 2004). There are no independent studies on the epidemiology profiles of hysterectomy in Africa and so there is no comparative data. It will be difficult to conclusively comprehend biosocial determinants of hysterectomy in Zimbabwe as it is a sensitive topic, no communication between the researcher and the patients and not well informed to the general public. There is a lack of such research studies in Zimbabwe.

There is need to use the data from Mpilo Hospital in Bulawayo. Mpilo Hospital is a referral hospital receiving samples from Matebeleland and parts of Midlands notably Filabusi Mission, Gwanda Hospital, Plumtree, Mbuma Hospital, Maphisa and Inyati to name a few. It would provide data that represents Southern region public sector hospitals in Zimbabwe giving a holistic picture of the profile.

All samples received after the 6th of September 2019 were only done in 2020 after the end of the Doctors strike. Only high priority cases or emergencies were handled during this period creating a difference in the volume of the work received as compared to work done. The backlog could have resulted in other samples being handled within the private sector thereby distorting the total work load for late 2019.

This is a retrospective study. Some laboratory reports may be incomplete and/or inconclusive and therefore not suitable for study.

Study Delimitations

Delimitations are the characteristics that limit the scope and describe the boundaries of the study, such as the sample size, geographical location or setting in which the study takes place, population traits, etc. (Insights, 2019). It is a low resource setting as the reports for samples received in 2019 were already reported and entered into the computing system at Parirenyatwa Group of Hospitals (PGH) allowing for centralized and easier collection of data.

The regions represented by the hospitals that send in samples will be used to explore risk factors associated with the geographical locations of the hospitals. The assumption is that the patients live near or around the hospital and access health care services at that hospital nearest them. Therefore they could be exposed to the risk factors associated with the location or hospital.

Literature Review

2.1 Introduction

Very few independent studies have been done on the epidemiology profile of hysterectomy around the world with fewer countries having conducted population based studies on hysterectomy. With the use of hysterectomy as treatment recently demystified in the 20th Century, a lot is yet to be extracted.

2.2 Misconceptions of hysterectomy

Hysterectomy is usually performed to treat/manage cancer and other non-cancerous conditions such as fibroids, prolapse, endometriosis, vaginal bleeding, severe dysplasia of the uterus, dysfunctional uterine bleeding, and post-partum bleeding and chronic pelvic pain. The severity of the medical condition determines the type of hysterectomy that will be performed. There are four types of hysterectomies and each procedure is classified according to the structures that are removed from the female reproductive system during surgery.

Subtotal hysterectomy involves the removal of only the uterine body (Amarin, 2017). It is also called a partial or supracervical hysterectomy. It removes the least amount of tissue and so is a treatment alternative when a woman has uterine fibroids, recurring fibroids, abnormal bleeding or chronic pelvic pain. Total hysterectomy involves the removal of both the uterine body and the cervix (Amarin, 2017). It is used to curb diseases such as

uterine and cervical cancer from spreading and treat endometriosis. It is usually not suggested to women who desire child bearing as it causes bareness.

Salpingo-oophorectomy is the surgery to remove the ovaries and the fallopian tubes. When both are removed, it's called a bilateral salpingo-oophorectomy. (Pietrangelo, 2017). Therefore total and bilateral salpingo-oophorectomy (BSO) is when the uterus and cervix together with the fallopian tubes and the ovaries are removed. This is usually performed on women who are at risk of ovarian cancer. The main source of the estrogen hormone is eliminated causing sterility by induced menopause. Radical hysterectomy is the surgery to remove the uterus, cervix and part of the vagina. The ovaries, fallopian tubes and lymph nodes may also be removed (NCI Dictionary of Cancer Terms, n.d.). Tissue that surrounds the cervix in the pelvic cavity is also removed and so most tissue is permanently removed from the woman's body. This procedure is most suitable for women with endometrium or cervical cancer spreading to the cervix. The end result is premature ending of menstruation causing bareness.

Hysterectomy can furthermore be classified according to the surgical techniques used to remove the structures during the hysterectomy. There is laparoscopy, vaginal, abdominal and laparoscopically assisted vaginal hysterectomy (LAVH) (Hysterectomy, 2012). Robotic hysterectomy also known as Da Vinci is another option but is pricey and the least common. The type of hysterectomy performed on women is based on the availability/lack of alternatives to hysterectomy, depends on whether gynecologic malignancy has been ruled out, laboratory testing based on the surgeons index of suspicion and the patients risk factors. The risk factors of a patient commonly determine the most suitable type of hysterectomy that will be performed on them (Kovac, 2002).

However, the history of hysterectomy and hysteria were previously entwined. Hysteria and its diagnosis evolved undoubtedly as the first mental disorder to a neurosis condition and finally, symptomatically synonymous with the normal functioning of female sexuality (Tasca & Rapetti, 2012). At some point, female hysteria was thought to be a nervous disease, peculiar to women and caused by a dysfunction of the uterus; literally of the womb. In Western medicine, hysteria was commonly diagnosed in women who exhibited a wide ray of symptoms such as anxiety, fainting, heaviness in the abdomen, and others. Hence, for hundreds of years, women were forced to either enter asylums or undergo a surgical hysterectomy procedure as it was thought removal of the uterus would fix the above.

This wasn't in the Western sphere only. 'Dating back as 1900BC Egypt, Eber Papyrus thought hysterical disorders to be caused by abnormal movements of the uterus.' (Vanvuren, 2017). This misconception of the linkage between hysteria and removal of the uterus rampaged across many civilizations as it was thought to be a cure for a variety of sexist symptoms.

However, during the early 20th century, Sigmund Freud, an Austrian neurologist, claimed hysteria was nothing but an emotional affliction caused by trauma which furthermore, both males and females could be affected or experience. His claims were supported by the decline on the number of French journals on hysteria studies by medical authors. '...at the turn of the nineteenth century, hysteria is widely held nowadays to have dwindled greatly in its rate of occurrence...' (Micale, 1993).

Micale concluded that the reduced rate of hysteria and hysterectomy diagnosis' was because hysterectomy was no longer treatment for emotional 'outbursts', feminine associated illnesses together with abdominal abnormalities. The surgical hysterectomy was now appropriately offered as a medical procedure for women with lower abdominal issues and other feminine reproductive related symptoms. However, the name stuck.

2.3 Conceptual framework

The conceptual framework focuses on four key areas (domains);

- The indicators of hysterectomy also the determinants of health
- The hysterectomy procedure
- The clinical data depicting the health status of a person
- The demographics of the population and contextual information

The risk factors which are also the determinants of health, in this case, the determinants of the procedure usually include social, economic, psychological and biomedical factors. These factors impact the participants of the study on an individual based pathology, however also producing highly patterned health differences in populations. A study on the incidence and determinants of hysterectomy in a low-income setting in Gujarat, India suggested that weak sexual and reproductive health services and wide spread perception that the post reproductive uterus was dispensable normalized hysterectomy among women of the reproductive age, at a relatively low mean of 36years of age. (Desai S. O., 2016) . It further quotes a high-income settings study on hysterectomy in Italy, New Zealand and the United States that confirms hysterectomy as a product of social and biological processes (Desai S. O., 2016). The study then concludes that a burden of untreated morbidity, attitude towards the uterus and an ill equipped health system were the determinants of the prevalence of hysterectomy in Gujarat, India.

This is supported by a previous study done by one of researchers, Sapna Desai on the prevalence studies of hysterectomy among rural and urban women Gujarat. Approximately one third of the women in the study who had had a hysterectomy performed on them were younger than 35 years. A women's organization that operates a community based health insurance scheme within the study went on to further suggest that the women had hysterectomies performed on them due to difficulties with menstruation and a range of gynecological morbidities. A similar recommendation on provision of community health education for women and better provision of basic gynecological care were areas for advocacy and concern (Desai & Ajay, 2011) supporting the claim that would be later revealed in an incidence and determinants study.

The determinants point to discernable health conditions emanating from the factors within the health status of a patient. The health status reveals the condition the patient had which in turn becomes the causative pathway of determining the type of hysterectomy that was performed on a patient and where. "Therefore, the fact that at least some pathological changes in the individual human body occur in highly patterned ways in whole populations or subpopulation groups requires explanation, in the same way that individual pathology requires explanation." (Kelly, 2009).

“At the national level, higher age, parity of at least two children, less than 5 years of education, higher wealth, and no history of sterilization were associated with higher odds of hysterectomy” (Desai S, 2019). The demographics obtained from a study were the first nationally representative estimates of hysterectomy among women aged 15-49 who had had a hysterectomy done in India concluding the procedure was prevalent in women of a median of 37 years of age.

The framework is based on the precept that both individual and population patterns of disease have causal mechanisms. These are analytically separate. Explanations of individual diseases involve the interaction between biological, social and related phenomena. Explanations of population patterns involve the same interactions, but also additional interactions between a range of other phenomena working in tandem. These are described. The causal pathways therefore involve the social, economic and political **determinants of health**, as well as psychological and biological factors. (Kelly, 2009)

2.4 Frequency and distribution of hysterectomy

A cluster-sampled study from a parent cohort study in rural Anyang, China was conducted to determine the epidemiology profile of hysterectomy in rural Chinese women. It was a population based study that concluded that the overall prevalence of hysterectomy was 3.31%. Women aged over 40 had a higher prevalence of prior hysterectomy at 5.01% than those aged between 25 and 39 at 0.33%. Of the 75 cases who provided further information on hysterectomy out of 110, 84.00% (63/75) had undergone total abdominal hysterectomy and 70.67% (53/75) had received surgery for leiomyoma (Fangfang, 2017).

In a cross-sectional study, a hospital based study was used to determine the prevalence and outcome of hysterectomy at Douala General Hospital in Cameroon. The prevalence of hysterectomy was 14.54% with the mean age at 45.76 years. 18.7% respondents had previously had a cesarean delivery. Multiple leiomyoma had a prevalence level of 58.2% and heavy vaginal bleeding at 60.6% being the main diagnoses for hysterectomy. Most respondents i.e. 79.5% of the participants underwent total abdominal hysterectomy (Egbe, 2018). No literature exists in Zimbabwe on the frequency and distribution of hysterectomy.

2.5 Epidemiology profile of hysterectomy and its patterns in occurrences

In a low income setting in Gujarat, India, strong evidence showed that the incidence of hysterectomy was independently associated with age, amongst women between 25 – 54 years, with lower incomes status and at least two surviving children. Hysterectomy appears to be promoted as a first or second-line treatment for menstrual and gynecological disorders that are actually amenable to less invasive procedures (Desai S. O., 2016). A national and state-level analysis on the patterns of hysterectomy in India iterated the critical need for treatment options and to address hysterectomy among young women in particular. There is a need for alternatives to treat gynecological morbidity in young women considering that hysterectomy is irreversible (Desai S, 2019). Due to the unavailability of baseline hysterectomy studies, its patterns in occurrences in Zimbabwe have not yet been established.

2.6 Direct determinants of hysterectomy among women

A baseline survey study on young women's health was published that focused on the factors associated with hysterectomy in Australia. It identified these factors across urban, rural and remote areas in Australia. 'Factors significantly associated with hysterectomy included living in a rural or remote area, state of residence, having private health insurance, lower levels of education, being married and having more than two children, having had other gynecological and non-gynecological surgical procedures, and more visits to general practitioners.' (Byles, 2000).

An incident and determinants abstract of a low-income setting in Gujarat, India highlights strong evidence that women of reproductive age underwent hysterectomy at higher rates. Qualitative research suggested weak sexual and reproductive health services, lack of knowledge and post-reproductive widespread perceptions had normalized hysterectomy. (Desai S. O., 2016). No literature in Zimbabwe was found on this topic therefore this study aims to cover the gap in hysterectomy studies in Zimbabwean literature in this area.

Research Methodology

3.1 Introduction

Research methodology is the specific procedures or techniques used to identify, select, process, and analyze information about a topic. The methodology section answers two main questions: How was the data collected or generated? How was it analyzed? (Research Support: Research Methodology, 2020). It looks into the research design, data collection procedure, data analysis, ethical considerations and the summary. Parirenyatwa Group of Hospitals histology laboratory processes surgical, post mortems and cytology samples only. In 2019, PGH Histology lab received 3578 surgical specimens. From the 3578, 350 were hysterectomy samples which had the results issued out as a lab report by a Pathologist and Consultant that viewed the slide prepared by the Scientist.

3.2 Research design

An observational cross sectional quantitative design was used to determine the epidemiology profile of hysterectomy in Northern Zimbabwe. The study was descriptive to help in unfolding the frequency of hysterectomy within the population. The cross sectional research design focused on the status of the individuals in the study at the same time in a well-defined population. This allowed for the collection of all histology laboratory reports (with name withheld) for those who had a hysterectomy performed and the specimen was received at PGH in 2019. The quantitative approach was used to quantify the prevalence levels of hysterectomy and its variables for statistical analysis.

3.3 Study setting

The study was conducted at PGH Histology laboratory in Avondale, Harare in 2020. The PGH Histology laboratory is the central laboratory serving the greater part of those who access public health within the Northern region in

Zimbabwe. It serves as a referral laboratory for Mutare Provincial Hospital (MPH), Chinhoyi Provincial Hospital, Marondera Provincial Hospital, and Mazowe District, Sally Mugabe Central Hospital (SMCH), Chitungwiza Central Hospital and others. Hence, the data required for this study is centralized at PGH histology laboratory.

3.4 Study Population

The study focused on a total of 350 histology laboratory reports of all women and age groups of hysterectomy specimens received at PGH between 1 January and 31 December 2019.

3.4.1 Exclusion Criteria

The study excluded all reports without the required clinical data such as the referring hospital, age, type of hysterectomy performed and full or inclusive laboratory reporting.

3.4.2 Inclusion Criteria

All histology surgical specimens are received together with a laboratory request form which gives the name of the patient, age, sex, ward, months and hospital the specimen is being received from. Included is the nature of specimen, clinical data of the patient, requesting Doctor and the date the sample is collected. Information on the laboratory request form is transposed onto the laboratory histology report. This study included PGH histology laboratory reports with conclusive result reporting and laboratory reports with complete information such as age, nature of the specimen, type of hysterectomy performed and referring hospital should be known. However, the data had the names withheld to ensure patient confidentiality is maintained throughout the study. The laboratory number and hospital number was used for identification.

3.5 Sample size

No algorithm was used to determine the sample. All reports that meet the inclusion criteria were included in the sample size.

3.6 Sampling Procedure

The census method, also known as the complete enumeration method, was used. It is a popular approach in collecting primary data. "Under the census or complete enumeration method, the statistician collects the data for each and every unit of the population or universe. This universe is a complete set of items which are of interest in any situation." (Census, n.d.) The universe might also be of a particular place, a group of people or any specific locality which is the complete set of items and are of interest in any particular situation. It will allow all laboratory records that meet the selection criteria of the study in 2019 to be included as part of the data.

3.7 Data collection Instruments

This study used a data abstraction form to collect data. It allowed for the use of stored laboratory reports, which are scientific records, to identify and systematically collect data necessary and required for the study. Patient names were removed to ensure patient confidentiality.

3.8 Pilot Study/Pre-testing of instruments

A small sample size was drawn from the PGH histology department using stratified sampling method. 'Stratified sampling procedure is the most effective method of sampling when a researcher wants to get a representative sample of a population' (Sampling Procedures, 2012). It involves categorizing the members of a population into mutually exclusive groups and collectively exhaustive groups and a simple random sample is drawn from each group. It gives the most representative sample of a population. The data was analyzed to see if the results can be replicated. It allowed the data collection instrument, the data abstraction form, to be tested in its ability to deliver reliability and validity when implement.

3.9 Data Collection Procedure

The Histology Specimen Entry book has a list of all specimens received, together with the name of the patient, referring hospital and ward, hospital number and practitioner who requested the test. The hospital number is used for reporting, which is then used to pull out the laboratory reports and the rest of the data is used to ensure the correct report has been accessed. The nature of specimen highlighted the procedure performed also revealing the corresponding hospital number of the specimen.

The hospital numbers were then compiled by the researcher and sent to the Histology department Secretary at PGH who for confidentiality reasons, printed out the reports for the year 2019. The researcher then filled in the data abstraction form using the laboratory reports provided. Any medical terms were deciphered by the Pathologists allowing for an accurate translation of the histology reports.

3.10 Analysis and organization of data

The data abstraction form was double checked to ensure correct transposing of report data. The laboratory and hospital number was maintained throughout however, the variables were collected and code for the options available in the data. It was entered in excel coded under columns of age group, type of hysterectomy, month, hospital sample was received from and possible determinant of having the hysterectomy performed. It was then be checked again for coding errors such as transcription and/or transposition errors, corrected and cleaned.

The data was organized and then analyzed using Statics and Data software also known as STATA to give an inference on the epidemiology profile of hysterectomy in Northern Zimbabwe by using the relationship between the ages, hysterectomy performed, findings of the Histology slide and geographical location to recommend variables and/or factors associated with the procedure that would help further the study. A correlation analysis was also done to determine if a relationship existed between factors, and if so, how significant the relationship was. Data was also analyzed by a Pathologists to ensure correct pathology reporting from the histology reports and in determining the correct possible determinant or indications of hysterectomy.

3.11 Ethical Considerations

Permission to carry out the research at Parirenyatwa Group of Hospitals histology laboratory was requested and approved. Histology data at PGH belongs to Ministry of Health and Child Care, MoHCC. Permission to carry out the research was sought from the MoHCC and approved. The Africa University Research Ethics Committee (AUREC) approval was sought before any study was conducted. They reviewed the proposal to determine if the study met the ethical and scientific standards of the university and protected any participant of the study. Upon satisfaction, AUREC issued out a letter that was used to request for the study to be conducted at PGH histology laboratory. The patient's results on the histology report were kept private by using the unique laboratory number allocated out to all specimens received and their hospital numbers.

3.12 Summary

Research methodology described, focused on how the study will be conducted by the researcher and how data will be collected, organized and analyzed. The study population and site, samples size and sampling procedure, data collection tools, inclusion and exclusion criteria, data analysis and ethical considerations are provided in this chapter.

Results

4.1 Introduction

A census-sample from a cross sectional study was conducted in Harare, Zimbabwe to determine the epidemiology profile of hysterectomy in Northern Zimbabwean women. From a total of 350 specimens located in the Histology entry book, 34 reports were excluded. Of the 34 excluded, 21 were not reported and had missing histology reports, 10 had hospital numbers recorded in the entry book found invalid in the management system. Two had missing or incomplete information and one had a different specimen than the one noted in the entry book. Three hundred and sixteen (316) reports met the inclusion criteria.

4.2 Frequency and distribution of hysterectomy in Northern Zimbabwe

The age range of the study was between 1 and 85years. This was determined by the age noted on the reports that met the inclusion criteria. . It was a population based study that concluded that the prevalence of hysterectomy was 9.81% with a mean age of 42.19 years. The 21-30 years age group had the least number of hysterectomies received at 6.67% with those less than 20 years of age having 7.94%. The age group 41-50 years comprised of 32.70% of the population study and have a higher prevalence of hysterectomy than those aged between 31 and 40 years of age at 27.3%. All the women aged 60 and above constituted 11.11% of the population study who had had a hysterectomy performed. However, 60% of all the hysterectomies performed were between 31 and 50years of age.

Of the 316 reports received, 47.78% received surgery for leiomyomata and 18.67% for a post-partum hemorrhage. 6.33% were surgeries for chronic pelvic pain and 3.80% from high grade squamous dysplasia. These were the main diagnosis for hysterectomy. Six cases out of all the 316 cases each gave a prevalence of 0.32% for its possible direct determinant of the hysterectomy procedure. One report showed a specimen that was received decomposed, the others not concluded, of a miscarriage, caused by non-Hodgkin's lymphoma, low grade squamous dysplasia and DUB. 8 out of 316 cases, 2.53% showed a normal uterus and 0.63% reports were of choriocarcinoma. 6.01% of the reports collectively showed cancer; 3.165% of cervical cancer, 1.58% of endometrium cancer, 0.95% of ovarian cancer and 0.32% of non-Hodgkin's lymphoma.

Thirty-five point forty-four percent (35.44%) of the hysterectomy specimens were from Parirenyatwa Group of Hospitals, 26.27% were from Mutare Provincial Hospital and 22.78% from Sally Mugabe Central Hospital. 13.92% of the hysterectomy specimens were from Chinhoyi Provincial Hospital, 1.27% from Chitungwiza Hospital and 0.32% from Bindura Hospital.

Of the 316 cases that met the inclusion criteria, 189/316 (59.81%) had undergone a total abdominal hysterectomy while 59/316 (18.67%) had their uterus removed. Subtotal hysterectomy was prevalent at 19 (6.01%) with both TAH+SO and TAH+BSO at 17/316 (5.38%). The least done procedure was the radical hysterectomy at 4.75% with 15 cases of 316 received. 33.5% of the specimens were processed between January and April, 57.0% between May and August and 9.50% of the samples were processed in last third of the year, between September and December. 11 cases were processed in September, 5 in October, 14 in November and 0 in December.

4.3 Epidemiology profile of hysterectomy and its patterns in occurrences

Hysterectomy is prevalent in women between the ages of 41 to 50 years of age with a mean of 42.19 years with extremes of 1 year and 85 years. The indications for hysterectomy were dominated by postpartum hemorrhaging and leiomyomata with 18.67% and 47.78% respectively. Total abdominal hysterectomy is the most frequent performed hysterectomy at the rate of 59.81%. Parirenyatwa Group of Hospitals had the highest number of specimens sent in at the histology laboratory at 35.44% and Mutare Provincial Hospital at 26.27%. Fifty-seven percent (57%) of the specimens were reported between May and August which was the majority of the reports done for the year 2019.

4.4 Direct determinants of hysterectomy among women

The data revealed the medical determinants of a hysterectomy within Northern Zimbabwean women. Leiomyomata is the most common indicator of a hysterectomy at 47.78% together with postpartum hemorrhage at 18.67%.

Table I, Indicators of hysterectomy

N=316

Direct determinants of hysterectomy	Frequency	Percentage (%)
Post-partum hemorrhage	59	(18.670)
Leiomyomata	151	(47.78)
Leiomyomata + Chronic pelvic pain	7	(2.22)
Cervical Cancer	10	(3.16)
Endometrium Cancer	5	(1.58)
Chronic Pelvic Pain	20	(6.33)
Ovarian Cancer	3	(0.95)
Endometriosis	2	(0.63)
Choriocarcinoma	2	(0.63)
High Grade Squamous Dysplasia	12	(3.80)
Normal	8	(2.53)
AUB	6	(1.90)
DUB	1	(0.32)
Uterine Prolapse	5	(1.58)
PMB	3	(0.95)
Decomposed	1	(0.32)
Pelvic Inflammation Disease	2	(0.63)
Not Concluded	1	(0.32)
APSSR	2	(0.63)
Chronic Pelvic Pain +Men	3	(0.95)
Infection	3	(0.95)
Low grade Squamous Dysplasia	1	(0.32)
Benign Tumor	2	(0.63)
Non-Hodgkin's Lymphoma	1	(0.32)
Miscarriage	1	(0.32)
Benign Cyst	2	(0.63)
Ovarian Cyst	3	(0.95)
Total		(100)

Leiomyomata are the most common benign neoplasm in women. There are commonly known as fibroids prevalent in the 41-50 year age group and the most prevalent in the indicators of hysterectomy at 47.47%. Post-partum hemorrhage is prevalent in the 31-40 years age group at 18.67% as an indicator of hysterectomy. Ovarian, cervical and endometrium cancer, pre-cancer low and high grade squamous dysplasia collectively constitute 10.13% of the indicators of hysterectomy prevalent in the 41-50 years age group. These represent 76.27% of the indicators of hysterectomy of the 316 reports. Chronic pelvic pain, and with fibroids, or with heavy MEN cumulatively represent 9.49% of the cases.

Also, 1.90% of the cases are due to abnormal uterine bleeding which was only treated by a total abdominal hysterectomy predominantly in the 41-50 years age group with 3 cases, 31-40 years with 2 cases and 51-60 years with one case. Uterine prolapse had 5 cases, all performed in women above 60 years of age. However, 2.53% reports indicated normal uterus; 4 of the reports were brought in by MPH, 3 by SMCH and 1 by PGH.

The rest of the indicators of hysterectomy each represent <1% of the total cases notably one reported indicated a decomposed sample that could not be reported. One other sample was not concluded. Three others showed infection and two had a hysterectomy performed to treat choriocarcinoma.

4.5 Summary

The results show that those between the ages of 41 and 50 are the most frequent to have undergone a hysterectomy. The leiomyomata is also the most common indicator of hysterectomy, together within post-partum hemorrhaging. Total abdominal hysterectomy is commonly performed on the majority of the women. Parirenyatwa Group of hospitals has the highest number of samples received and Queen Victoria has an almost equal share of patients.

Summary, Conclusion And Recommendations

5.1 Introduction

This chapter looks into explaining the results institute in Chapter 4. This chapter allows the data collection procedure outcomes to be interpreted and explained and allowing it to give a better understanding of the hysterectomy profiling in Northern Zimbabwean women.

5.2 Discussion

Frequency and distribution outcomes of hysterectomy in Northern Zimbabwe

Of a total of 316 reports, 103 (32.59%) were in the 41-50 years age group. There is a higher frequency of hysterectomy in women between 41 and 50 years, with a mean age of 42.19 years possibly due to most women

having passed the child bearing age. A study in Cameroon on the epidemiology profile and complications of hysterectomy revealed that the 41 to 50 years age group was the most represented with a mean age of 46.39 years. Most of the women are nearing or are post-menopausal and can undergo a hysterectomy as they are past childbearing age (Ngaroua, 2019).

The hysterectomy procedure is also not encouraged as a first line treatment for lower age groups since it is irreversible hence it is less frequent and should be undergone as an emergency. Whilst the older age groups undergo it to manage prolonged discomfort, pain and management of a gynecological conditions, presumably, fully aware it is irreversible and a lasting solution or treatment to their conditions. This suggests that the 41-50 years age group is at higher risk of having a hysterectomy performed. This is supported by a study on the prevalence, sociodemographic determinants and self-reported reasons for hysterectomy in India. It concluded that one of the reasons of the likelihood and percentage of undergoing hysterectomy was relatively high in women between the ages of 45 and 49 (Shekhar, 2019).

There is a small correlation ($p=0.1594$) between the age group and the type of hysterectomy. A population based study in rural China of the epidemiology profile of hysterectomy done by (Fangfang, 2017) had similar results. The hysterectomy prevalence differed by age and the cause. Women over the age of 40 years had a higher prevalence of prior hysterectomy than those between the ages of 25 to 39. 84% of the women that provided further information had undergone a total abdominal hysterectomy and the procedure was for the leiomyomata.

The 1 to 20 age group had 25 samples in the group however, 20 of the samples were all aged between 1 to 2 years. Hysterectomy is not a medical procedure done in toddlers. Therefore 6.33% of the histological reports had incorrect ages. 13 of these reports were from Sally Mugabe Central Hospital, 4 from Mutare Provincial Hospital, 2 from Parirenyatwa Group of Hospitals and one from Bindura Hospital. The reports were included as there were complete but presented the issue of a possible clerical error or insufficient information sent in by the hospitals.

Women between the years of 31 to 40 are at a greater risk of postpartum hemorrhaging followed by 21 to 30. Women between the ages of 41 to 50 being at greater risk of leiomyomata although the values of leiomyomata hysterectomies were high in all age group except 21 to 30 years of age. The indicators for a hysterectomy show prevalence of diseases varying with age group however there is a small correlation ($p=0.1594$). Hysterectomy prevalence differed by age.

In Cameroon, 94% of the hysterectomies were total abdominal hysterectomy (Ngaroua, 2019) whereas in Zimbabwe 59.81% were total abdominal hysterectomy. 79.5% of the retrospective study underwent total abdominal hysterectomy (Egbe, 2018). 84% had a total abdominal hysterectomy procedure (Fangfang, 2017). Many factors determine the type of hysterectomy procedure that will be used starting from the ailment that is being treated, surgical skills of the Doctor, patient health and cost. There is a low count of total abdominal hysterectomy procedure that requires an understanding of whether it is the best method for indicators of hysterectomy and how the Doctor chose the procedure. All values of $p<0.5$ indicating small correlation over the variables studies.

Epidemiology profile of hysterectomy outcome and its patterns in occurrences

The epidemiology profile of hysterectomy in Zimbabwe followed closely to a similar study done in Cameroon. 41 to 50 years was the most represented group with a mean age of 46.39 and extremes of 18 years and 83years. The indications for hysterectomy was dominated by a polymyomatous uterus and uterine cervix cancer at 47.9% and 11.3% respectively (Ngaroua, 2019). The prevalence for hysterectomy in India was among women between the ages of 30 and 49years. These figures were for India as a whole. (Prusty, 2018). There is common ae in hysterectomy is frequent.

Total abdominal hysterectomy was the most common type of hysterectomy procedure used (59.81%) for women who had their samples sent at Parirenyatwa Group of Hospitals. (Fangfang, 2017) reported that the majority of the hysterectomies reported were performed abdominally and also for leiomyomata cases for the rural women in China. 79.5% of the retrospective study underwent total abdominal hysterectomy (Egbe, 2018).

Geographically, Parirenyatwa is the central hospital and all Northern Zimbabwean public hospitals send their Histology samples there. It is situated in the capital city and that could explain the high number of uterine samples. Mutare Provincial Hospital has the second highest number of samples. It could be that it serves the Manicaland region and hence the high number of samples. However, Chinhoyi Provincial and Bindura do not send as many samples as Mutare Provincial. The samples received are higher from major towns in Zimbabwe, with smaller towns sending less than 5 samples each. Perhaps a variable or a determinant exists, such as accessibility, cost, availability of Doctor skills, hospital capacity and awareness levels, that could explain the high number of hysterectomy sample when hospitals are compared regionally.

The p value <0.25 for all variables indicating a small correlation between hysterectomy with age, type of hysterectomy, possible indicator and the referring hospital.

Direct indicators outcomes of hysterectomy among women

Multiple leiomyomata (58.2%) and heavy vaginal bleeding (60.6%) were the main causes for having a hysterectomy performed (Egbe, 2018). The self-reported causes of hysterectomy are excessive menstrual bleeding/pain (56%), by the presence of fibroids/cysts (20%) and uterine ruptures or postpartum hemorrhages (14%) (Shekhar, 2019).

Hysterectomy procedures for postpartum hemorrhaging are emergency procedures. 18.67% of the procedures performed were postpartum hemorrhaging hysterectomies making the prevalence rate of postpartum hemorrhaging is 18.67%. This is high considering Denmark is at 2.6 per 10 000births and 10.7 in Italy (Kallianidis, 2020). Post-partum hemorrhaging is the leading cause of maternal mortality. (Smith, 2018) It is further risked by weight gain, pregnancy induced hypertension and other factors, commonly witnessed in pregnant women.

The indicators of hysterectomy should be noted in the clinical notes. However, in the event the data was unavailable, the Pathologists report could be used to determine the cause of having a hysterectomy performed.

However, the Pathologists findings and therefore the report data may not necessarily be the reason the patient had their uterus removed and so the lack of clinical information effects a bias on the indicators noted.

The marital status and employment status was undocumented. A PGH histology report patient profile shows the patient name and laboratory number, age, sex, requesting Doctor, ward and hospital number, referring hospital and clinical notes. This information is transposed from the laboratory form. It also shows the date and time sample was processed and reported. The marital status, employment status, method of payment are undocumented and became a hindrance in the assessment of the predictors and therefore the epidemiology profile of hysterectomy in Northern Zimbabwean women. "Exploratory analyses suggest state-level factors associated with prevalence include caesarean section, female illiteracy and women's employment.' (Desai S, 2019). Therefore, the prevalence of the indicators could be supported by socio-economic factors that affect hysterectomy being performed.

5.3 Conclusion

Conclusively, the study reveals that the prevalence of hysterectomy is 9.78% with the most represented age group being that of 41-50 years. It also shows that most common determinant for having the procedure was leiomyomata. It also reveals that 31- 40 years age group is the second most represented group that is commonly treated for postpartum hemorrhage. The total abdominal hysterectomy is the most performed type of hysterectomy. Parirenyatwa Group of Hospitals and Mutare Provincial Hospital perform the highest number of hysterectomy, respectively.

There is need for more variable consideration to allow for a better understanding of the factors that determine hysterectomy procedure among women.

5.4 Implications

Incomprehensive hospital check in forms give little or no data for further use or research. The factors associated with hysterectomy could have been more comprehensive to give a clear picture on the epidemiology profile of hysterectomy in Northern Zimbabwean women. Determinants of disease could have been supported better by the race, education, health insurance, parity, religion and caste, clinical/medical history, socioeconomic status to give a better understanding on the environments associated with hysterectomy. The small number of reports could have affected the precision of the research assessment on the predictors of hysterectomy.

This looks into the improvement of data that should be requested when patients check in for hysterectomy procedures and all surgeries in general. There is need for a collective review or evaluation of hospital forms to ensure all parties that require, use or update hospital forms can collectively edify the documents for filing and further use. There is need for appropriate data access to the laboratory when needed to ensure laboratory findings are supported by clinician notes and all other supporting staff.

The results were not as complete due to poor data capturing resulting in a portion of the data having errors, such as an incorrect hospital number and so could not be retrieved, incorrect age, mismatched data between specimen

entry book and report and missing clinical data. The determinant of hysterectomy was then retrieved from the report after Pathologists report. However, the reason a hysterectomy is done and the pathology report could be different distorting the result pool again. An example are 10 specimens excluded due to wrong hospital numbers. These might not have been reported, could have the hospital number clerically captured differently during or after processing or not entered into the system after reporting

The majority of the forms lacked clinical data and any laboratory tests that supported the need for the procedure to be performed. This questions the role of the laboratory work pre, during and post-surgery. This suggests the need for a set algorithm in laboratory testing before a hysterectomy can be performed. This is supported by the findings of normal uterus that were removed and showed no indication of any medical conditions and no supporting data provided by the hospitals and operating physicians or why the hysterectomy was performed. It further supports the use of alternative measures which should be introduced before undertaking the procedure. This is evident by patients with choriocarcinoma undergoing hysterectomy procedure as a treatment option.

Its implication in the laboratory profession is on the importance of laboratory testing pre, during and post decision making.

Postpartum hemorrhage indicates the need for further studies on hysterectomy and the complications of post-partum hemorrhaging and initiatives in the fight to lower the maternal rates. There are an indicator of emergency procedures that are constantly done during child birth that can be evaluated for better mother and child care.

The Doctors strike resulted in irregularities from September to December with no reports being done in December. This affected the number of reports received for the year and could have altered the result pool. All the samples received within that period were only processed and done in 2020 removing them from the 2019 data. The events of 2019 might mean the study might be a partial representation of the population.

5.5 Recommendations

Hysterectomy is one of the leading gynecological procedures all over the world with growing numbers in Africa and Zimbabwe. There is need for the Ministry of Health and Child Care to raise awareness on the procedure and the determinant medical conditions that precede it. There is need for further studies to determine the socioeconomic determinants of hysterectomy to allow for better awareness levels depending with the results of the study. Different social-economic classes have different habits and so this gives targeted social awareness methods.

Hysterectomy reveals the importance of sexual and reproductive health issues and the need for its constant awareness and new initiatives. The number of cases in 21-30 year old age group shows the need for sexual and reproductive education and rights advocacy in age groups even younger.

There is need to determine the incidence levels of hysterectomy in different regions to determine where the need is. Also, the data required to make a better population study is not noted on the laboratory or report forms making it harder to collect it in retrospective studies. There is need for the collection of reports including those of Mpilo Hospital and other hospitals that are receiving public hospitals for histology samples. This will give a snapshot of the holistic picture at a specific time nationwide.

Lack of clinical data and history does not allow for better procedure assessment and knowledge of other possible laboratory tests that could have assisted in decision making before choosing hysterectomy. This is especially critical for patients that underwent the hysterectomy procedure but were found to have normal uterus with no malignancies or benign disorders seen. This emphasizes the need for laboratory testing before the procedure for the cases that were not emergencies. Hysterectomy performed on patients who had disorders such as choriocarcinoma further supports laboratory testing and histology processing before an irreversible procedure is performed.

5.6 Suggestions for further research

On comparison, Mutare Provincial Hospital has high numbers of hysterectomy procedure derived samples sent to PGH. Its numbers tally with the central hospitals and hence there is need to further research on what can be done to determine justification on high numbers of hysterectomy from Mutare Provincial Hospital. The reasons can be from socio-economic factors, region the hospital serves, doctors' expertise, determinants of hysterectomy, hospital capacity and many others factors to influence the decision.

As mentioned earlier, the determinants of hysterectomy could have been supported better by the race, education, health insurance, parity, religion and caste, clinical/medical history, socioeconomic status to give a better understanding on the environments associated with hysterectomy. Further studies can be done to incorporate other factors giving a more comprehensive epidemiology profile of hysterectomy.

Research studies from all Histology centers in Zimbabwe would give a holistic picture on the epidemiology profile. This reduces the chances of error as the profile is determined on data than an inference from the results of Northern Zimbabwean women.

The manifestation of post-partum hemorrhage as one of the main causes of the hysterectomy procedure allows for the research into the epidemiology profile of hysterectomy and its complications. It can also allow for studies in deriving its contributions in maternal health management.

A case study analysis can be done on the samples that were viewed and reported as normal uterus in determining what errors, misjudgments or cause of the hysterectomy procedure on specimens later found to be normal. This further queries the algorithm that is used by surgeons in conjunction with laboratory testing in determining need for surgery.

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Declarations

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Dedication

I dedicate this to my mother; for her unwavering support, prayer and love. To my brother, for his patience, wisdom and encouragement in helping me see this through.

Abbreviations And Terms

List of Acronyms and Abbreviations

BSO - Bilateral salphingo-oophorectomy

LAVH - Laparoscopic assisted vaginal hysterectomy

USA - United States of America

DRC - Democratic Republic of Congo

PGH - Parirenyatwa Group of Hospitals

MPH - Mutare Provincial Hospital

SMCH - Sally Mugabe Central Hospital

MoHCC- Ministry of Health and Child care

STATA – Statistics and Data

AUREC- Africa University Research Ethics Committee

Definition of terms

Hysterectomy - is a procedure to remove a woman's uterus. (Stang, 2016)

Clinical profile - it is home to important patient details including their history. (ElationHealth, 2020)

Surgery - branch of medicine that is concerned with the treatment of injuries, diseases, and other disorders by manual and instrumental means. (Britannica, 2019)

Figures

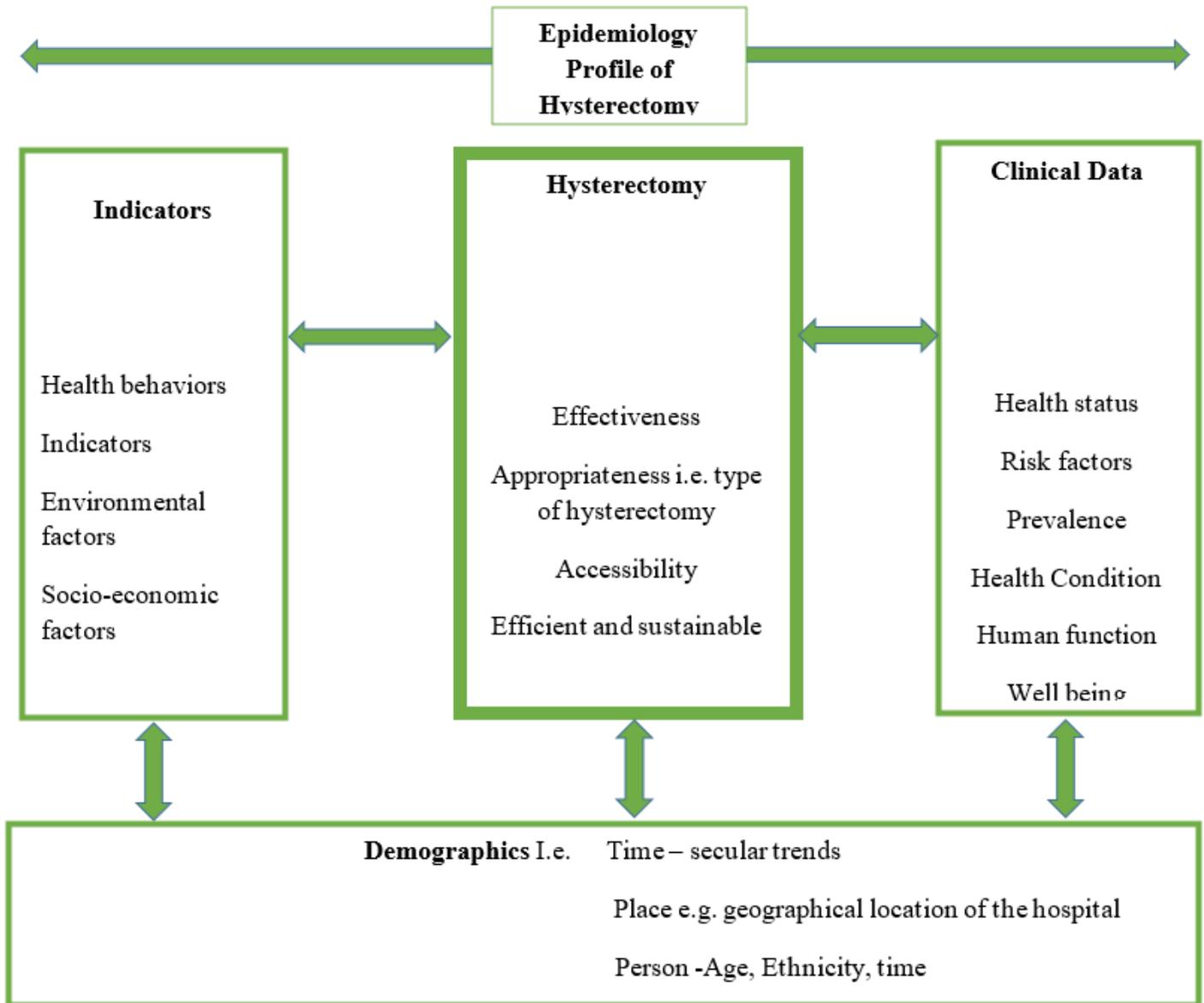


Figure 1

Conceptual Framework: Adapted from Australian Institute of Health and Welfare, 2020, Australian Health Performance

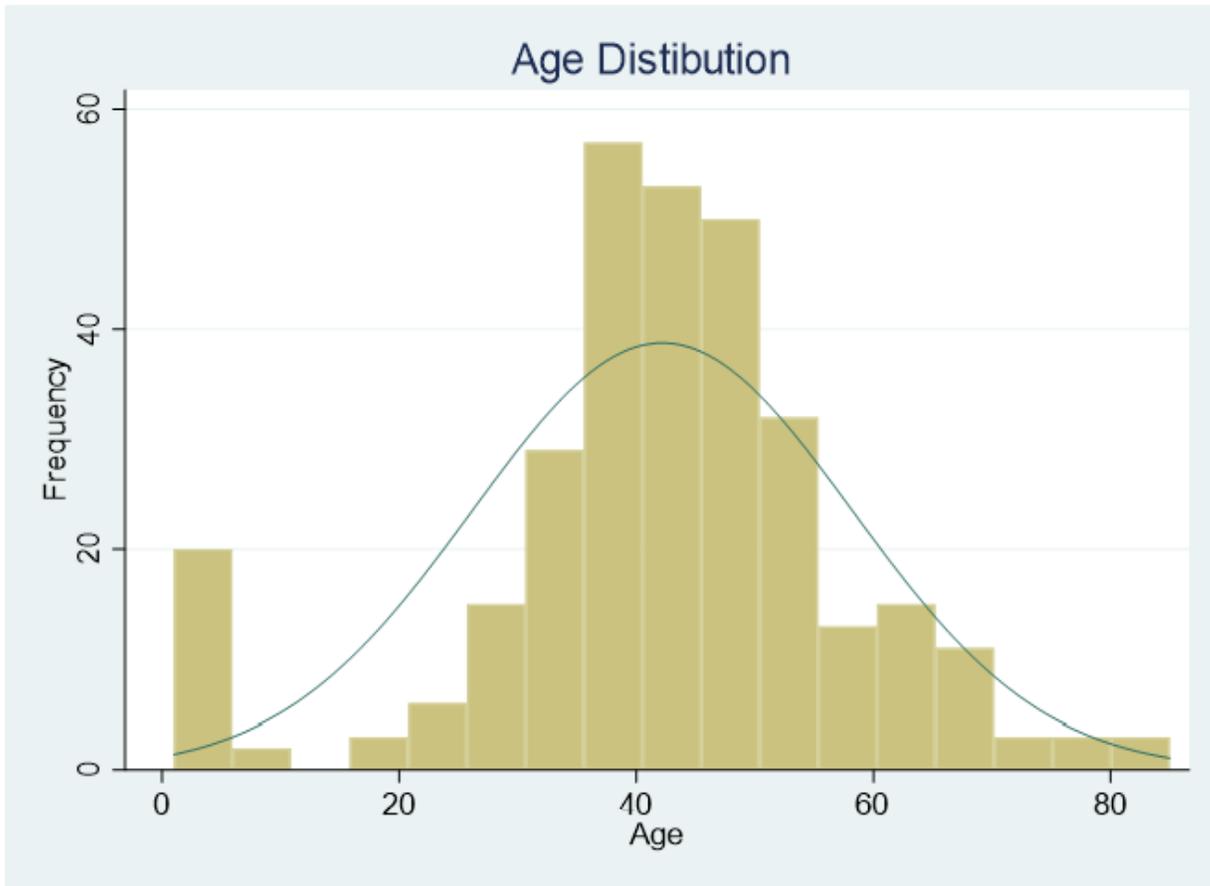


Figure 2

Women's Age Distribution. N=316

Supplementary Files

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- [Appendix.docx](#)