PROFILES OF WOMEN PRESENTING WITH OBSTETRIC FISTULAE AT UNIVERSITAS ACADEMIC HOSPITAL, FREE STATE PROVINCE, SOUTH AFRICA.

BY

DR MASEKHOKHO M.P. MAROKANE

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Supervisor: Prof Shisana Baloyi

DECLARATION OF AUTHORSHIP

I Masekhokho M.P. Marokane hereby declare that the compilation of this dissertation is the result of my own independent work. I have acknowledged people who have assisted me. I have used the research resources cited in the text in a responsible way and given credit to the authors and compilers of the references for the information provided, as necessary. I further declare that this work is submitted for the first time in this institution for the purpose of obtaining Master's degree in Obstetrics and Gynaecology (MMed O et G) and that it has never been submitted at any other institution for the purpose of obtaining a qualification. I also declare that all information about the participants obtained for the purpose of this research will be kept confidential.

Dr M.M.P. Marokane

12/11/2019

Date

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ABSTRACT

Keywords: obstetric fistula, prevalence, profiles, risk factors, management of obstetric fistulae and preventative strategies.

Background: Obstetric fistula is a serious consequence of prolonged and obstructed labour, common in low income countries were accessibility to emergency obstetric care may be limited. Most common cause is ischemia and necrosis of the soft tissues of the birth canal caused by the compression of the foetal presenting part against the bony pelvis. This results in abnormal communication between the vagina, bladder and/or rectum with resultant leakage of stools or/and urine through the vagina. Other causes may be tearing of those tissues or iatrogenic injury during abortions.

Objectives:

Primary objective

To determine the prevalence of obstetric fistula at Universitas Academic Hospital urogynaecology clinic

Secondary objective

To determine the demographic characteristics of the women presenting with obstetric fistulae.

Study design and methods:

Retrospective descriptive-analytical study. Medical records and demographic characteristics of all patients referred to Universitas Academic Hospital's urogynaecology clinic with obstetric fistulae from 01 January 2013 to 31 December 2017. A 21- item data sheet was used to collect data and the latter was analysed on the Microsoft excel spreadsheet.

Limitations:

Small sample size, only 46 patients met the inclusion criteria over the 5 year study period.

Results:

The prevalence of obstetric fistula at UAH urogynaecology clinic was found to be 1% which correlates with the global estimates in the literature. The most common type of fistula was found to be rectovaginal fistula (63.04%) and mostly they developed as a result of soft tissue lacerations not necessarily ischemia and necrosis. Only 5(10.87%) patients in our population group delivered before the age of 20 though it is reported globally that this condition is the most in teenagers.

Fifty percent of the study population were not married and only 2(4.35%) of the married ones were divorced. 63.04% of the study population had high school level education and only 8.7% of them were employed. Out of 46 participants only 2 (4.35%) did not seek antenatal care, the median number of follow-up in this group was 4 antenatal visits. Almost all of them (91.3%) delivered normally and only 4 had episiotomies. The perineal (71.74%) tears were common in this study group and some remained not sutured. Most of them delivered at a level 2 health care facility.

Conclusion:

The prevalence of obstetric fistula in our setting although shown to be low, like in the rest of the world, more attention should be paid to maternal health services as this complication of child birth is the indicator of poor/inadequate health service.

Although the level 2 facilities are regarded as well equipped to deal with obstetric emergencies authorities are urged to pay more attention to skill development of the personnel rendering the maternity care as most of these cases were not appropriately managed during the intrapartum period, use of partogram during labour during be encouraged so that those patients who will end up with obstructed labour can be identified timeously.

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LIST OF ABBREVIATIONS

OF	Obstetric fistula
VVF	Vesico-vaginal fistula
RVF	Recto-vaginal fistula
RVVF	Recto vesico-vaginal fistula
RVD	Retroviral disease
NVD	Normal vaginal delivery
ANC	Antenatal clinic
BMI	Body mass index
UFS	University of the Free State
HSREC	Health Sciences Research Ethics Committee
FSDoH	Free State Department of Health
UAH	Universitas Academic Hospital
WHO	World Health Organization

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CHAPTER 1

BACKGROUND

Obstetric fistula (OF) is a serious consequence of prolonged obstructed labour in most cases. It is most common in low income countries where access to intrapartum care may be restricted. It is caused by the foetal presenting part which is continually compressing the birth canal soft tissues against the bony structures of the pelvis causing ischemia and necrosis resulting in abnormal communication between the vagina and the bladder or/and the rectum, leading to continuous urinary and faecal leakage. In most cases the baby dies during labour process leaving the woman with sadness of losing her baby on top of the trauma caused by incontinence.

Obstetric fistulae occur mostly in Sub-Saharan Africa, the Middle East and South Asia. In the developed countries fistulae are mostly due to iatrogenic causes such as surgical interventions, for example hysterectomies, or radiotherapy. The prevalence of OF is an indicator of how good or poor are the obstetric services of that health system; that is, the high prevalence indicates the failure of the system to provide accessible and appropriate intrapartum care.

1.1 EPIDEMIOLOGY

The relative rarity and stigma attached to this condition makes it difficult to determine the exact prevalence as the affected women are generally embarrassed to seek help. It has been estimated by Waaldijk K. in 1993 that the incidence of obstetric fistula is 1 to 2 per 1000 deliveries. The World Health Organization (WHO) estimates that 50 000 to 100 000 women develop obstetric fistulae globally every year and that more than 2 million are affected worldwide. Stanton (2017) highlighted the lack of scientific basis for the incidence and prevalence quoted by WHO.

In 2015 Tuncalp and his colleagues reviewed 19 studies trying to estimate global incidence and prevalence of but most of those studies used samples which were not representative of the population being studied. In South Africa there is only one published study on obstetric fistula which was done at the University of Kwa-Zulu Natal by Prof S. Ramphal and his colleagues in which they were determining the demographics and of OF in patients who were seen at their Urogynaecology clinic for a period of 5 years, from 1999 to 2003. Therefore there are no South African statistics available as far as obstetric fistula is concerned.

1.2 PROBLEM STATEMENT AND STUDY RATIONALE

For every maternal death an additional 20-30 women develop serious pregnancy related complications. Among all maternal morbidities obstetric fistula is the most devastating and life-changing obstetric injury. Although obstetric fistula is a rare complication, it is still too common in Sub-Saharan Africa and there are few reliable population based estimates of its prevalence.

Despite the devastating impact of obstetric fistulae have on the lives of the girls and women affected, they are still neglected and there are no strategic plans in place to combat this disaster, with this study we are aiming at determining the profiles of women affected and identify the risk factors. By so doing those who are at risk could be identified and be managed adequately and appropriately. This will also assist policy makers to come up with strategies to curb this problem and address the issues/problems which are related to this problem, for example, personnel should be trained on how to manage patients in labour and be able to identify problems timeously so that appropriate interventions can be taken.

1.3 RESEARCH OBJECTIVE

The objective of this research is to determine the prevalence of obstetric fistula at Universitas Academic Hospital's Urogynaecology clinic and the demographics of women presenting with this condition so as to determine which women are at risk so that preventative strategies could be devised and implemented.

1.4 THE STRUCTURE OF THE DISSERTATION

The dissertation is dived into six chapters.

Chapter 1: Background

This chapter provides background information of the researched problem and why is it important to be addressed especially in our country where the maternal morbidity and mortality still pose a serious challenge for our health care system.

Chapter 2: Literature review

In this chapter the current collective knowledge on this subject is appraised, comparing the trends globally and seeing if there any conflicting views and results as far as this condition is concerned with the ultimate aim of comparing our findings those already in the literature.

Chapter 3: Research methodology

The methods used in this research are described, the prerequisites, the inclusion and exclusion criteria, the requests for permission to conduct the study from relevant authorities, research setting, sampling data collection and analysis of data are discussed are all discussed in this chapter.

Chapter 4: Results

The results from the data collected are reported and analysed in numbers, tables and figures.

Chapter 5: Discussion

The analysis and explanation of what these results mean and their implications on the study.

Chapter 6: Conclusion and recommendations

Conclusions are drawn from the results and recommendations are made to health care authorities to implement strategies which will curb the problem which was studied.

CHAPTER 2

LITERATURE REVIEW

2.1 INTRODUCTION

A literature review is a critical appraisal of the current collective knowledge on the subject. It should be personal but unbiased. It be the synopsis of the information which includes findings and inconsistences. Literature review also enables one to identify other research that supports one's findings, as well as those that differ from yours. (Winchester CL and Salj M 2016)

Reference to prior literature is a defining feature of academic and research writing, why review the literature (Feak CB et al 2009):

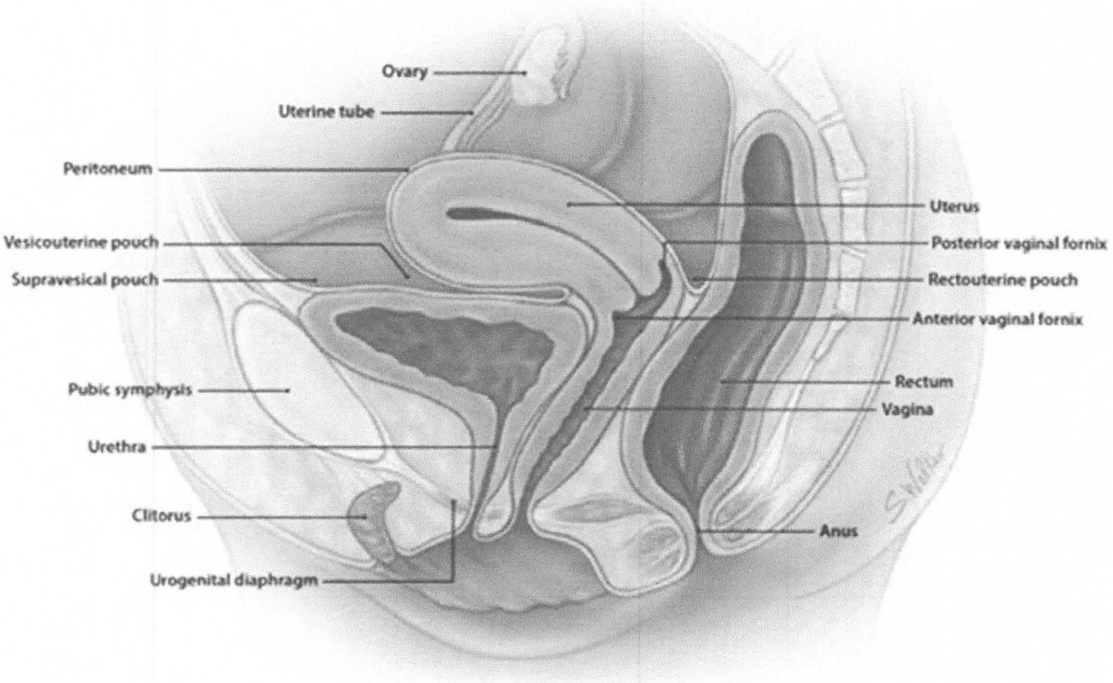
- To help one to understand the research topic
- To establish the importance of the research topic
- To help one to develop their own ideas
- To make sure that one is not replicating the work which has already been done
- To demonstrate knowledge and show how your current work is situated within, builds on or departs from earlier publications

2.2 DEFINITION OF OBSTETRIC FISTULA

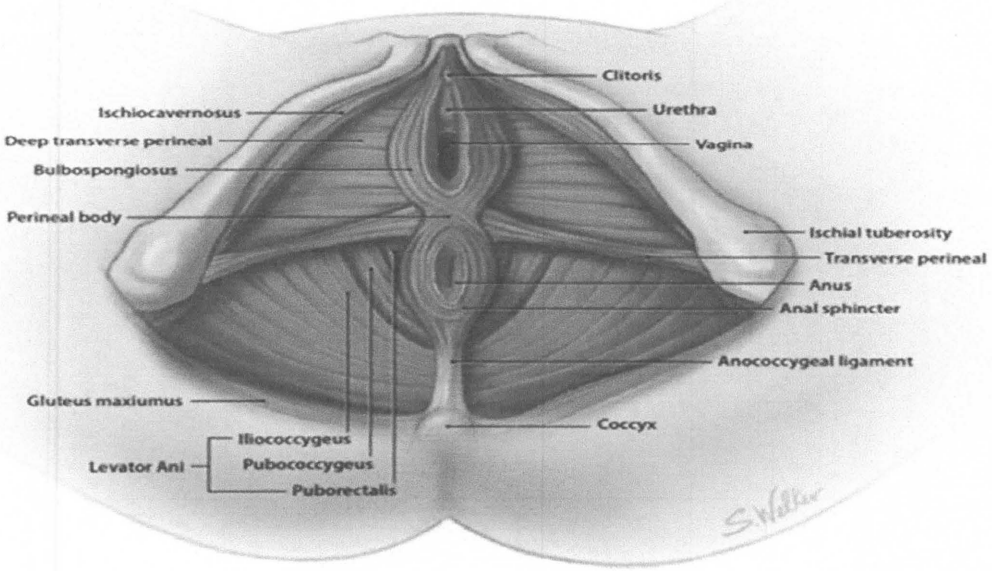
Obstetric fistula is defined as a direct communication between the vagina and the bladder (vesico-vaginal fistula) and/or between the vagina and the rectum (recto-vaginal fistula). It usually occurs after prolonged or obstructed labour, genital mutilation or induced abortions leading to continuous leakage of urine and/or faeces through the vagina.

2.3 ANATOMY OF THE PELVIS

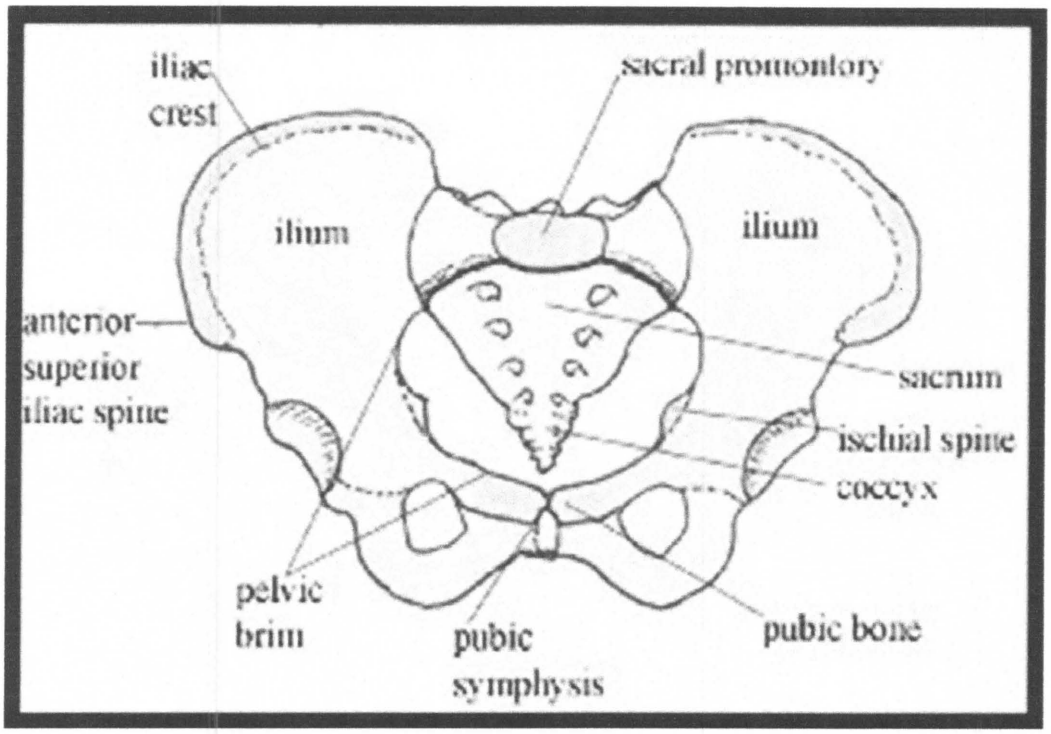
2.3.1 Soft tissue anatomy



2.3.2 Perineal soft tissue



2.3.3 Bony pelvis



2.4 PATHOPHYSIOLOGY OF OBSTETRIC FISTULA

Women who do not demise from obstructed labour almost always suffer devastation of a stillbirth and problems arising from obstructed labour such as drop foot due to compression of lumbosacral spinal nerves and obstetric fistula.

There are 3 main causes of obstetric fistula, ischemia and necrosis due to prolonged compression of soft tissues of the birth canal by the foetal presenting part against the bony pelvis, the second most common cause of obstetric fistula is the direct tearing of the same soft tissue during the precipitous labour or instrumental assisted deliveries and the third most common cause is the termination of pregnancies by unskilled personnel especially if in cases where instruments are being used.

These causes are not mutually exclusive and may have additive effects. Each of these occurs as a complication of delivery or instrumental evacuation of the uterus by unskilled medical personnel.

2.5 TYPES AND CLASSIFICATION OF OBSTETRIC FISTULAE

2.5.1 Fistula types:

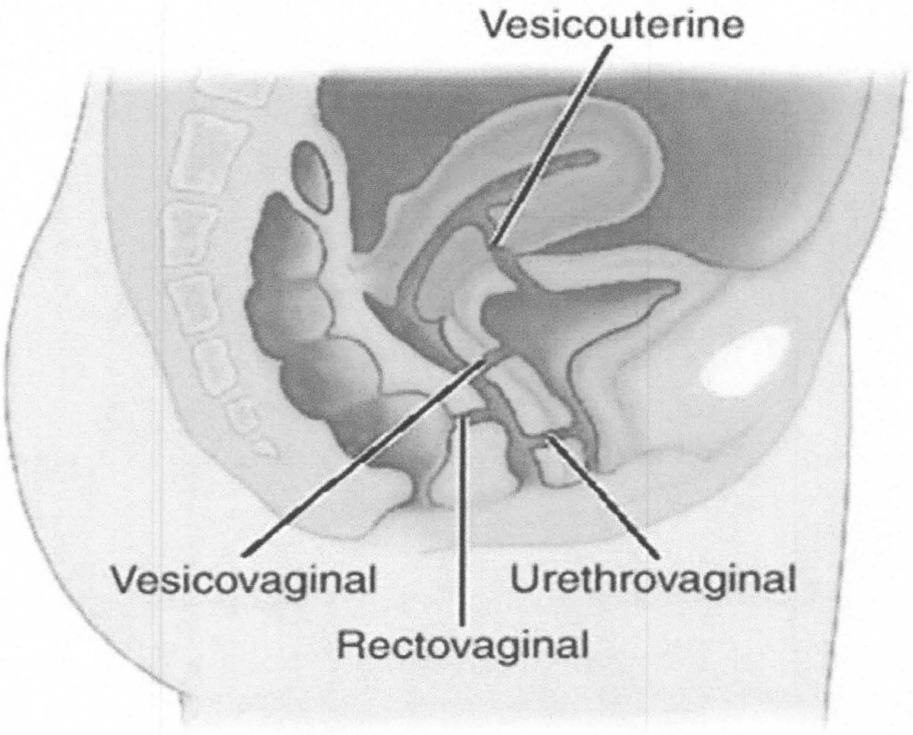
There are several types of obstetric fistulae:

(i) Vesicovaginal fistula (VVF) occurs between the vagina and urinary bladder.

(ii) Rectovaginal fistula (RVF) which occurs between the vagina and the rectum

(iii) Recto-vesicovaginal (RVVF) where there are defects between the vagina and both the bladder and rectum

(iv) Other fistulae that are less common in obstetrics which include urethrovaginal, uterovaginal and enterovaginal fistulae



2.5.2 Fistula classifications:

Fistula type and classification depends on the anatomic sites involved. The location and the size of the fistula, with any complicating factor such as scarring and the extent of fibrosis form part of classification. There is no generally accepted classification system for obstetric fistulas. The Goh system is the most widely used system as it has been validated by intra- and inter-observer correlation and it appears well with surgical repair outcomes. Fistula classification systems which have been previously employed proved to be flawed as the parameters used were mostly subjective. The Goh system attempts to be more objective by using a fixed reference point and specific measurements by taking into account possible surgical and postoperative consequences.

The Waaldijk fistula classification (1995) was initially thought to be valuable in planning management and predicting the outcomes but because this system uses variables which are subjective, it is no longer favoured, and comparative studies have shown the Goh (2012) system to be superior.

The Goh classification system divides the genitourinary fistulae into 4 main types depending on the distance of the distal edge of the fistula from the external urinary orifice, these 4 types are further sub classified by size of the fistula, the extent of fibrosis and the vaginal length.

The Goh classification:

Type 1: Distal edge of fistula >3.5 cm from external urinary meatus (EUM)

Type 2: Distal edge of fistula 2.5-3.5 cm from EUM

Type 3: Distal edge of fistula 1.5-<2.5 cm from EUM

Type 4: Distal edge of fistula <1.5 cm from EUM

(a) Size <1.5 cm in the largest diameter

(b) Size 1.5 cm-3 cm in the largest diameter

(c) Size >3 cm in the largest diameter

i. None or mild fibrosis and/or vaginal length >6cm

ii. Moderate or severe fibrosis and/or reduced vaginal length

iii. Special consideration, for an example, post radiation, ureteric involvement, Circumferential fistula or previous repair

2.6 RISK FACTORS OF GENITAL FISTULAE

2.6.1 Obstetric risk factors

The data on risk factors for OF is lacking and this information is needed as it will assist policy makers in coming up with preventative strategies. Adler and colleagues (2013) conducted a meta-analysis of risk factors associated with obstetric fistula from 12 different countries which included India, Pakistan, Bangladesh, Nigeria, Kenya and Ethiopia. In their study they found seven primary risk factors which are teenage pregnancy, primiparity, short stature, lack or no antenatal care, long duration in labour (more than 24 hours), home deliveries and illiteracy.

They found vesico-vaginal fistula (VVF) to be more prevalent as compared to recto-vaginal fistula (RVF); 79-100% VVF versus 1-8% RVF. The combined vesico-rectovaginal fistula accounted for about 23% of all fistulae. They also found that 86% of patients were teenagers, 66.7% primiparous and 97.4% were less than 1.5m tall. Most of them (94%) tried home delivery before they could be transferred to health care facility already having obstructed labour.

Teenage population is the most vulnerable to develop OF because their pelvises are immature and most often contracted, this makes it extremely difficult for them to give birth and they often have prolonged and obstructed labour with resultant fistula formation.

In a cross-sectional study done by Banke-Thomas and colleagues (2013) deduced that child marriages is a global problem with estimated 12 million girls been married of before they turned 18 years and some as young as 9 nine years old.

Birth attendants in most cases were not skilled and they delayed seeking help or transferring patients to facilities with emergency obstetric care services; and because of lack of transport and long distances to the facilities this resulted in prolonged obstructed labour. The mean duration in labour was found to range between 2.5 to 4 days, 95.7% of these patients were in labour for more than 24 hours. Illiteracy amongst them was up to 96%.

In case control study done in Western Uganda to determine risk factors for OF, they found that surgeons performing second stage Caesarean sections contributed a significant proportion (25%) of OF on top of those listed above.

In one study from Kenya, Kimani ZM et al (2014) found women with OF were more likely to seek help more than 6 hours from the onset of labour, and all had to travel for more than 2 hours to reach a health facility. Most women with OF were found to have laboured for more than 24 hours.

In retrospective study of women who presented with OF between 2014 and 2016 in South West Asia there was a total of 86 patients, out of this 86 68(79.1%) developed VVF, 13 (15.1%) developed RVF and 5.8% RVVF. Majority of them were from rural areas and 65% of them were illiterate. Most of them were in the age group of 18-24 years and 65.1% of them were primiparous. Investigators in this study concluded that efforts should be made to improve educational status of these women from the rural areas so as to keep them in school and delay the age at which the fall pregnant.

2.6.2 Non-obstetric risk factors for genital fistula

Traumatic

-sexual violence (for example forceful sexual intercourse and or insertion of foreign body into the vagina)

-accidental trauma (falling onto a sharp object)

-female genital mutilation

Infections

-granulomatous infections

-tuberculosis

-human immunodeficiency virus

Malignancies (especially in advanced stages of cervical malignancies)

Radiotherapy (pelvic radiotherapy for malignancies)

Iatrogenic (pelvic surgery, for example hysterectomies)

Congenital (although it has been described in literature these fistulae are very rare)

2.7 THE IMPACT OF OBSTERIC FISTULA (OF)

2.7.1 The impact on physical wellbeing

According to the Fistula Foundation (2010) the direct consequence of obstetric fistula is urinary and faecal incontinence, 95.8% of respondents affirmed this. This constant leaking of urine and faeces leads to damage of the skin of the vulva and the thighs. They are also prone to recurrent infections as the protective barrier formed by the normal flora also gets eroded by the acidic pH of the urine with subsequent perineal ulcerations, only 36.6% of respondents reported pain during sexual intercourse. In attempt to avoid constant dripping women with fistula restrict they fluid intake with subsequent severe dehydration with possible death or renal failure. Other manifestations from obstructed labour injury complex include damage to cervix, injury to the lumbosacral nerves and foot drop. This reduces their mobility with the risk of developing deep venous thrombosis.

2.7.2 The psychosocial impact

The psychosocial circumstances in which these women find themselves as the result of having sustained an obstetric fistula can be more devastating as compared to the physical injuries themselves, humiliation, abandonment and stigmatization was reported by 97.2% of the participants globally.

Most women become social outcasts instead of enjoying the new motherhood with their families, in Burkina Faso most people believe OF is a punishment or a curse for disloyal or disrespectful behaviour towards the in-laws.

The incontinence and the pain make them unable to perform their duties as mothers and wives thus rendering them valueless to their families hence most of them are divorced, in one study conducted in Burkina Faso the divorce rate was as high as 89% in women with OF. Despite this there hardly any studies that have specifically concentrated on husbands of women who are affected. In Tanzania there was an agreement that those partners who agree to stay with their affected spouses be allowed to have another woman and that the wife should understand and accept this. Due to stigma associated with this condition it is also reported that some husbands were ridiculed in their communities. Therefore this highlight the need to study the experiences of the partners in order to involve them in caring and rehabilitation of these women. Because of stigmatization and marginalization most of these women end up being depressed with suicidal ideations and withdrawn from the society, despite all this trauma only 7.5% of these women are able to access treatment according to UNFPA (2008).

2.7.3 The economic impact

According to Women's Dignity and Engender Health (2008) income is lost in different ways including the direct cost of fistula related care, time taken away from income generating activities to seek care, the woman's inability to work due to stigma, the physical effects of the fistula itself and their families are negatively affected as they have to forgo the income which was generated by these women and survive with the little they have.

2.8 EVALUATION AND DIAGNOSIS OF OBSTETRIC FISTULA (OF)

An obstetric fistula should be suspected in women presenting with a complaint of involuntary leakage of urine or/and faeces soon after the delivery. The following factors should be considered in history taking: her age and parity, OF is more common in young primiparous women; how long ago has she been having symptoms and the duration in labour, prolonged and obstructed labour is risk for developing OF, and if she sustained perineal tears or episiotomy was cut, if so were they repaired and lastly if her baby survived or not.

On clinical examination a leaking urine from the vagina may be observed with accompanying perineal dermatitis or ulceration. On speculum exam faecal material may be seen as well as urine. Fistula site can also be identified on speculum examination, fibrous tissue around the defect helps in identifying the lesion. Methylene blue/indigo carmine test is also useful in evaluating the defect.

Special investigations which could be employed in assessing the patients with OF are renal function tests, full blood count and urine microscopy, culture and sensitivity as these women needs to be optimized before they undergo surgery.

Abdomino-pelvic ultrasound is done mostly for higher up fistulas especially those which involve the ureters, colour Doppler ultrasound with contrast medium has been described as diagnostic tool for VVF by Meeks GR et al (2012)The benefits of ultrasound are easy to learn, is non-invasive and it does not use radiation. Transvaginal ultrasound findings correlated well cystogram, urography, cystoscopy and surgical findings.

Cysto-urethroscopy for bladder and urethral assessment and intravenous urogram which is useful in assessing renal function in ureteric injuries.

The use of computed tomography (CT) scan with intravaginal contrast medium to detect VVF has been described with limited value, it has been shown to be more beneficial in determining the extent of the injury before surgical intervention (2012).

2.9 MANAGEMENT OF OBSTETRIC FISTULA (OF)

2.9.1 Conservative management of OF

2.9.1.1 Catheter and debridement immediately postpartum

It has been generally accepted rule to wait with repair of OF for at least 3 months to allow tissue reactions to subside, however this attitude seems to be in contrast in how necrotic lesions are generally managed. This inaction for so long is the first step into the direction of becoming an outcast, with the ultimate negative psychosocial, economic and physical impact on the wellbeing of those affected.

Already in 1985 Zimmern concluded that if fistula is small and the patient's vaginal leakage is healed with bladder catheterisation then the fistula has a high spontaneous cure rate with 3 weeks trial of catheter drainage. He also noted that in general, if at the end of 30 days of catheterisation the fistula has reduced in size, a trial of continued catheterisation for further 2-3 weeks may be beneficial. He concluded that if no improvement is observed after 30 days then the fistula was unlikely to heal spontaneously.

Successful cases were characterised by the following: continuous catheterisation for up to 4 weeks, VVF was diagnosed and treated within 7 days, diameter was less than 1cm and the fistula was not associated with malignancy or radiation.

In a study conducted by K. Waaldijk (2009) in Nigeria over a period of 9 years looking at the effects of immediate management of fresh OF he found that 95.2% of 1716 patients he had were healed at 6 months follow-up after the first attempt, and after the second attempt at closure on those who were still leaking, 98.5% of them were continent. Fifteen percent were healed by catheter only, the latter was found to be dependent on fistula size.

Insertion of catheter immediately after delivery prevents fistula formation on a site of vaginal wall necrosis. It is estimated that 15-20% of such fresh fistula may achieve spontaneous closure by just immediate bladder catheterisation. In cases where fistula has already formed, on top of catheterisation vaginal wound care including debridement is advised as this allows spontaneous healing as well.

When OF is diagnosed in the immediate postpartum period, continuous catheter drainage may result in spontaneous closure within the first 3 months postpartum. Excision of necrotic tissue and irrigation with normal saline of purulent exudate assist in healing of the defect. Betadine

solution should be avoided as it may inhibit macrophage migration and thus inhibiting wound healing.

After Caesarean section for obstructed labour urinary catheter should be left in- situ for 10-14 days as early removal predisposes to urinary retention. If there is urinary incontinence post removal it (catheter) should be reinserted immediately and be kept for at least 4 more weeks, fistula is likely to heal spontaneously if it less than 2 cm in diameter. If there still a leakage after 4 weeks then it is unlikely that it will heal spontaneously.

2.9.1.2 Alternative fistula procedures: plugs, cautery and bio-glue.

Endoanal fistula plugs, made of porcine small intestine submucosa facilitate spontaneous closure of recto-vaginal fistula by creating a growth factor matrix that mechanically closes the defect. This may be considered for women with intact anal sphincter and small RVF with minimal fibrosis.

Some small case series demonstrated a limited value of in small vesico-vaginal that are not close to ureters or urethra. Cautery may be done transvesically through cystoscopy or vaginally. Those which have been shown to respond well to this modality are typically less than 0.7cm in diameter. Catheterisation for two to three weeks with anticholinergic medication has been reported to be useful with this modality.

2.9.2 Surgical management of obstetric fistula

2.9.2.1 Basic principles of fistula surgery

The initial repair provides the optimal chance for successful closure in any given fistula. The subsequent attempts at closure have proved to be more complicated to effects of the previous attempts on tissues.

The basic principles include:

- Watertight closure of the defect without applying too much tension to the tissues.
- Avoiding damage to the upper urinary tracts by applying ureteric if necessary.
- Reinforcement of bladder neck and anal sphincters when involved in the defect.
- Maintain adequate blood supply, incorporate flaps and grafts as needed.

2.9.2.2 Principles of pre-operative care of OF patient

The general condition of OF patients should be improved preoperatively, those deemed nutritionally needy warrants high protein and fat diet, rehydration to improve their renal function and nutritional supplements such as zinc, vitamins and iron which are necessary for wound healing. The urine needs to be acidified to diminish the risk of cystitis and calculi formation. Pre-existing infections should be treated pre-operatively.

Bowel preparation should be done the night before the day of the operation especially in those complicated high recto-vaginal, recto-cervical and recto-uterine fistula. Anaerobic antibiotic coverage should also be instated. Colostomy is rarely necessary in rectal fistulae

2.9.2.3 Medications

Oestrogen therapy has been shown to assist in optimizing tissue vascularization and healing. Oral treatment alone has been found to sub optimally oestrogenize urogenital tissue in 40% of women, vaginal cream is recommended as it is shown to be more effective.

Non-steroidal anti-inflammatory drugs (NSAIDs) and corticosteroids are known to reduce inflammatory response in the affected tissues, but their efficacy has not been proven. They also carry potential risk for impaired wound healing. Corticosteroids are not recommended for VVF treatment if early repair is planned.

Acidification of urine to diminish risk of cystitis, mucus production and bladder calculi formation should be considered, especially in the interval between the diagnosis and surgical repair of VVF. Vitamin C 500mg three times a day can be used to acidify urine.

Urised, a combination of antiseptic (phenyl salicylate) and parasympatholytic (hyoscyamine sulphate) is effective for control of post-operative bladder spasms.

Sitzbaths and barrier ointments such as zinc oxide preparations can provide relief from local ammonia dermatitis caused by leaking urine.

Antibiotic prophylaxis for VVF repair was the focus of the study done by Tomlinson and Thorton in Benin, in 79 patients who went for VVF repair they found that intra-operative Ampicillin did not reduce the odds of failed repair but that patients who had prophylactic

antibiotic had fewer urinary tract infections and required less antibiotic treatment postoperatively.

The route for repair depends on accessibility of the defect.

Site of fistula	Approach
Low fistula (urethra)	Vaginal
Bladder neck	Abdomino-vaginal
Mid-vaginal	Transvaginal
High vaginal	Abdominal

2.9.2.4 Vaginal approach

The vaginal approach is associated with minimal blood loss, shorter operative time, shorter recovery time and low postoperative morbidity. In addition bowel is spared from manipulations, which are common with abdominal approach, resulting in morbidity such as ileus and inadvertent injuries.

2.10 SURGICAL PROCEDURES:

2.10.1 Latzko procedure

It was first published in 1942 as a modification of the Simon colpocleisis by Latzko. The Simon technique applied a transverse closure of the vagina beneath the fistula defect, unfortunately it often resulted in the formation of symptomatic diverticulum between the bladder and the cervix. Latzko was of the opinion that to avoid that complication then hysterectomy should be done and for the repair to be successful the following prerequisites should be met; the vaginal vault length should be adequate as his procedure can lead to at least 1.5cm reduction in vaginal length and secondly that the fistula should be at the apex of the vagina so that the posterior margin of the fistula and the vault scar should coincide thus forming part of the posterior wall of the bladder.

The technique:

The vaginal mucosa is resected in a circular fashion at a distance of 1.5cm from fistula opening. The fistula and bladder mucosa is left as it is and a double row of sagittal sutures is placed on either side of the fistula in the raw surface, with the second row burying the first one. A third layer is applied by closing the vaginal wall in contact in contact with the bladder

and thus making it the posterior wall of the bladder. Eventually there will be re-epithelisation with transitional epithelium.

This technique is simple and has high success rate, some authors reported 100% success rate, and is associated with low morbidity. It has no effect in bladder capacity and ureteral orifices are not compromised even with fistulae located close to these orifices.

2.10.2 Flap-splitting technique

In this technique the vaginal wall is incised in a circular manner around the fistula and dissected from the underlying pelvic fascia, leaving the fistula tract not resected. The bladder is closed tension free in 2 layers, then the vagina is closed over the bladder defect. Margolis and his colleagues found this procedure (1994) to be efficacious as the Latzko technique but with better outcomes in large VVFs. They also noted the risk of possible ureteral compromise with this technique.

2.10.3 Vaginal cuff excision procedure

With this procedure the patient is put in lithotomy position and cystoscopy is performed. The Foley's catheter is placed in the fistula tract and traction is applied vaginally. The vaginal mucosa is also resected in circular manner for a radius about 0.5cm from the vaginal cuff, including the fistula. This incision is then obliquely extended to the bladder wall so that the fistula tract can be resected in a funnel shaped manner.

The defect is then closed in 4 layers; first the bladder is closed with a single layer of interrupted sutures, pubocervicovaginal fascia in 2 layers with interrupted with interrupted sutures as well, then the vaginal wall is closed.

Indigo carmine is injected intravenously and cystoscopy is then performed to ensure patency of the ureters and the integrity of the bladder. Suprapubic catheter is the preferred method of bladder catheterisation and it is maintained for at least 3 weeks postoperatively.

Flynn and his colleagues in their retrospective study of 40 patients who underwent vaginal cuff scar excision for VVF repair from February 1998 to December 2002 reported 100% success rate at 3 months follow-up.

2.11 ABDOMINAL APPROACH:

The patient should be positioned in lithotomy position with vaginal access. The abdominal wall incision type is the matter of the surgeon preference. The advantage of the midline incision is that the surgical access is easy and incision can be extended if need be.

Simple fistulae can be repaired transcervically (extraperitoneal) but intraperitoneal approach is preferred for the complicated ones. In the **transcervical repair** the bladder dome is opened, the fistula is excised and bladder muscle layer is mobilized off the vagina then the defects are closed in layers, the disadvantage of this approach is the difficult exposure. The **intraperitoneal approach** is useful for repairs close to the ureters and in large recurrent fistulae. The need for extensive dissection is reduced as compared to the transcervical approach. (Meeks, 2012)

The use of vascularized tissue grafts can be helpful in ensuring successful repairs. The one mostly used is the omentum as it has dual blood supply. Bladder mucosa can also be harvested from the dome of the bladder and be placed over the repaired fistula regardless of whether the tissues surrounding the repaired fistula look normal. In some complicated fistulae both vaginal and abdominal approaches **(combined approach)** can be employed simultaneously for repair.

2.11.1 Indications for the abdominal approach

- High inaccessible fistula.
- Involvement of the uterus and the bowel.
- If there is a need for ureteric re-implantation.
- If the fistula itself is complex, that is, if it involves 3 or more organs.

2.12 MINIMALLY INVASIVE APPROACH

Minimal invasive surgical procedures have been employed to close VVFs. McKay came up with endoscopic transurethral extracorporeal suturing technique to close the VVFs.

The extracorporeal abdominal (O'Conor) technique has also been achieved successfully laparascopically.

2.13 COMPARISON OF SURGICAL TECHNIQUES

Randomized controlled trials comparing techniques of VVF repair have been done, data suggest that success rates of each technique are comparable, Angioli and colleagues found the vaginal approach achieved comparable results to other modalities whilst minimizing operative complications, hospital stay, blood loss and postoperative pain. (Angioli 2003).

Dorairajan and colleagues compared Latzko repairs and laparoscopic O'Conor repairs retrospectively and they found the procedures were comparable in terms of operative time, blood loss and postoperative pain. They recommended vaginal approach over more complex techniques over more complex ones like laparoscopic technique and they further recommended vaginal approach over transurethral one. (Dorairajan 2007).

2.14 PRINCIPLES OF POST-OPERATIVE CARE

Like in all reconstructive surgery the healing phase is as important as the surgery itself.

2.14.1. Wound healing:

Adequate hydration, nutritional supplementation and high protein diet are all important to optimize healing. Severely fibrotic patients may benefit from oestrogen topical ointment. Antibiotics may be used but in the study conducted by Hancock (2009) broad spectrum antibiotics were shown not to reduce the odds for failed repair.

2.14.2 Bladder catheterisation:

Urinary retention can ruin a well repaired fistula by bursting the suture line, so care should be taken that catheters are not blocked. When catheter is not draining and bladder is not full on palpation then ureteric obstruction or dehydration should be excluded.

2.14.3 Stool management:

Those patients with RVF their stools should be kept soft so that the suture line does not get distended during the bowel movement, stool softeners and laxatives may be used. Sitzbaths are recommended at least twice a day or as often as they are needed. Douching and enema are not recommended as they introduce infections or disturb the normal flora milieu.

2.14.4 Physical exercises:

Ambulation is recommended in 1-2 days post-operatively to prevent complications such as deep venous thrombosis (DVT). No intensive exercises are recommended, those with neurological fall-out (drop foot) should get physiotherapy.

2.14.5 Clinical examinations:

Pelvic, vaginal and speculum examinations during the first 4-6 weeks postoperatively should be avoided because the tissues are still delicate.

2.14.6 Pelvic rest:

Tampon use and coitus should be avoided for at least 4-6 weeks. Some authors recommend pelvic rest for at least 3 months.

2.15 COMPLICATIONS OF SURGICAL MANAGEMENT OF OBSTETRIC FISTULA AND THEIR MANAGEMENT

2.15.1 Early complications:

Complications which can appear soon after fistula repair include the following:

Anaesthetic complications:

These are generally divided into 2 major groups:

- The drugs given- dosage problems and allergic reactions.
- The procedure itself- general anaesthesia with problems with intubation and spinal which can supress respiratory efforts if the level is high.

Haemorrhage:

- Primary haemorrhage which occurs within 24 hours of surgery usually results from unsealed bleeding points.
- The secondary one occurs more than 24 hours post-surgery is due to infection with erosion into a vessel.

Infection:

- It can involve the wound itself or other systems such as respiratory and urinary systems
- Wound infection can lead to wound dehiscence leading to recurrence of faecal and urinary incontinence with stricture formation in other cases.

Surgical injury:

- Injury can occur to surrounding structures such as ureters, urethra, bladder and bowel during the repair, if recognised intraoperatively those injuries should be dealt with immediately.
- They can occur due to tearing, tying and cauterisation.
- Ureters should be stented prior to repair to avoid injuries.

Anuria:

- This complication can occur due ureteric ligation or renal/prerenal failure, ureteric injuries should be managed immediately by releasing the suture, repairing the tear and re-implanting it.

Deep venous thrombosis (DVT):

- Early ambulation/physiotherapy, anticoagulants and use of compression stockings should be considered early in patients who are at risk to develop DVT.

2.15.2 Late complications:

Recurrence:

- Most of the recurrent fistulae are smaller than the original defect but characterised by multiple openings.
- They can be managed with 2 weeks of free drainage but if they persist then the patient should be taken back for second attempt in closure though it has been proven to be more difficult as compared to the first attempt.

Urethral and vaginal strictures:

- They are managed by incision of the scar tissue and urethral dilatation or/and intermittent catheterisation.

Vaginal fibrosis:

- This complication is treated with vaginoplasty and dilatation with a mold.

Urethral and anal stenosis:

- Anal stenosis usually complicates sphincteroplasty done with fistula repair at the same time.
- Anal stenosis usually needs incision and drainage and sometimes pharmacological relaxation of sphincter with drugs such as topical diltiazem.
- Urethral stenosis can be managed with dilatation.

Bladder calculi:

- Bladder calculi are relatively common after fistula repair, especially with urethral strictures.
- The strictures should be treated first then removal of stones can be carried out.

- Stones less than 2cm in size can be removed endoscopically and larger ones via suprapubic cystostomy.
- Patient should be encouraged to take high volumes of fluids to prevent recurrence and infections.

Amenorrhoea/infertility:

- It is caused by vaginal and/or cervical stenosis which cause hematometra.
- This complication is managed by draining the uterus and stenting the cervix.

Persistent lower urinary tract dysfunction:

- It is reported that up to 30% of patients still experience urinary incontinence after repair of VVF.
- Urinary incontinence after OF closure may be caused by:

  Low capacity, poorly compliant bladder

  Overactive bladder

  Atonic bladder with overflow incontinence

  Stress incontinence from sphincter damage or shortened urethra

  Sometimes due to combination of these conditions

Bowel dysfunction:

- Storage dysfunction (incontinence) and emptying (defaectory) dysfunction including faecal impaction or rectal obstruction may occur individually or in combination after successful closure of RVF.
- These are managed accordingly after thorough history taking and evaluation of the repair as patient's opinion might not necessarily correlate with clinical findings.

2.16 Strategies for prevention of obstetric fistula

The aims of any obstetric fistula preventative strategy should be to:

- Prevent women from developing fistulae through health promotion and awareness campaigns.
- Ensure those who are already having fistulae have access to health care providers who are skilled in repairing fistulae.
- Promote early and easy access to facilities which can provide Caesarean section and fistula repair services.

2.16.1 Primary prevention strategies

They are aimed at ensuring that pregnancies are planned and wanted and they (pregnancies) happen at the appropriate age as pelvises of young girls not well developed hence they end up with obstructed labour. Family planning services should be easily accessible and ensuring optimal nutritional status of women will assist with coping with physiological demands of pregnancy and complications such as obstetric haemorrhage.

2.16.2 Secondary prevention strategies

The pregnant woman with her support system (her family and community) need to be aware of the importance of antenatal care, skilled care at childbirth and symptoms of possible problems during pregnancy and childbirth such as prolonged labour.

These can be achieved by increasing community awareness, training traditional birth attendants and increasing knowledge of the pregnant women about normal pregnancy and delivery. Accessible local obstetric care facility is of paramount importance in secondary prevention of obstetric fistula.

Knowledge of how to use partogram during the intrapartum period and its consistent use will assist in managing labour process efficiently. The referral to a centre at which Caesarean section or assisted vaginal delivery should be done timeously as this is the key intervention in preventing complications related to obstructed labour.

2.16.3 Tertiary prevention strategies

They are designed to identify and prevent development of fistula in women who recently delivered and are at risk of developing fistula.

Birth attendants should be trained to help prevent fistula formation or to enable closure of small fistulae without surgical intervention by using indwelling urinary catheter for all mothers who have survived an obstructed labour.

Lastly all women who experienced prolonged and obstructed labour should be informed about fistula symptoms and be encouraged to seek help as soon as such symptoms appear.

2.16.4 Community involvement

Women with fistulae are often stigmatized and discriminated against, eventually they become social outcasts and remain hidden away from the rest of the community. This makes it difficult for them to seek help, therefore if communities are informed about this condition and which services are available in managing it, it would make it easy for them to treat those affected with compassion. Community participation is key for maternal and neonatal morbidity and mortality reduction strategies.

2.17 CONCLUSION

Although great advances have been made in obstetric care in the developed world, obstetric fistula remain on of the major challenges in the developing world. Affected women and their families are suffering immensely from this preventable catastrophe. Due to its rarity most governments do not pay the necessary attention to this problem. Its prevalence is one of the best indicators of how good or bad the health care system is.

The solution to the obstetric fistula problem will come ultimately from addressing the problems, such as poor contraceptive services and teenage pregnancies, associated with this condition. The governments should provide adequate and accessible maternal health care services.

Studies have shown the urgent need for dedicated and specialised fistula centres so that those affected can regain their fruitful lives. Obstetricians should take a lead in advocating for the rights of these young women, and implanting preventative strategies.

CHAPTER 3

RESEARCH METHODOLOGY

3.1 STUDY DESIGN AND SETTING

It is a retrospective review of medical records of patients referred to Universitas Academic Hospital (UAH) urogynaecology clinic with obstetric fistulae from 01 January 2013 to 31 December 2017. UAH is a tertiary hospital situated in the city called Bloemfontein, Free State Province, in the Republic of South Africa. It serves as the referral centre for all secondary hospitals in the province, Northern Cape Province, North-eastern parts of the Eastern Cape Province as well as Lesotho.

3.2 STUDY OBJECTIVES

3.2.1 Primary objective:

To determine the prevalence of obstetric fistulae among women who attended the urogynaecology clinic for the period of 01 January 2013 to 31 December 2017.

3.2.2 Secondary objective:

To determine the demographic characteristics of women presenting with obstetric fistula.

3.3 THE STUDY PROCEDURE

The subjects will be identified by booking register for urogynaecology and their medical information will be retrieved from the files and electronic medical records system (Meditech).

The hospital registration numbers will be used for identification of subjects instead of their names.

3.4 POPULATION AND SAMPLING

3.4.1 Population

The sample size will be determined by number of patients seen over that study period of 5 years with obstetric fistulae.

3.4.2 Inclusion and exclusion criteria

Inclusion criteria:

- Confirmed obstetric fistula
- Both primigravidae and multiparous women
- Any retroviral disease status

Exclusion criteria:

- Patients who presented with fistulae before or after the study period
- Non-obstetric fistulae
- Faecal and/or urinary incontinence secondary to pelvic organ prolapse

3.5 VALIDITY AND RELIABILITY

Validity and reliability was enhanced by conducting a pilot study with first 5 cases. More or less 10 patients were seen in each year so the audit was done on 46 patients who met the inclusion criteria.

The variables which were extracted from the records were the following: age, number of children, retroviral disease (RVD) status, body mass index (BMI), calculated from the weight and height measurements in the patients' files, age at delivery, educational status, mode of delivery (Caesarean section or normal vaginal delivery (NVD) with or without instrument assistance), duration in labour, duration of the symptoms, neonatal outcomes, and type of fistula (VVF, RVF or RVVF).

3.6 DATA COLLECTION

A 21-item data collecting sheet (see appendix) was designed and printed for every participant. All questions had close ended questions which had to be ticked on the data sheet, for example, for mode of delivery one option had to be chosen between caesarean section and normal vaginal delivery. If it was NVD then the next question would be whether it was assisted or not. Those which needed a straight forward answer like age or BMI the blocks were provided for the answer.

At the end of the data sheet there was also a question about whether the fistula was repaired or not and if it was repaired what was the outcome. All this information was retrieved from patients' files and Meditech system. All in all 46 patients met the criteria and their data was collected for this study. This data was collected by the researcher herself.

3.7 DATA ANALYSIS

Results from data collected were presented in an Excel spread sheet for each variable and sent to a Biostastician for analysis in the Department of Biostatistics at the University of the Free State (UFS). Final analysis was done on all 46 qualifying participants.

The analysis of the prevalence and demographic characteristics was done using the descriptive statistics, data was captured into Microsoft excel, cleaned and coded, then imported to statistical software program for analysis by the Biostastician.

3.8 CONFIDENTIALITY

The medical records and data collected were kept confidential and people who were involved in this study had an access to data collected. Data was stored on a password protected laptop and the files in the filing cabinet in the gynaecology clinic at Universitas Academic Hospital. No patients' names were used but hospital registration numbers for the purpose of identification.

3.9 ETHICAL CONSIDERATIONS

Research proposal (Appendix) was approved by the University of the Free State Health Sciences Ethics Committee (HSREC) (Appendix A). The same proposal was also sent to and approved by the Free State Department of Health (FSDoH) (Appendix B) in the State hospital.

Although a waiver of informed consent was granted as only medical records will be analysed and that the study did not any risk to the subjects, the Ministerial consent for the minors was requested and granted. The ethical clearance number of this study: UFS-HSD2018/1334/3007.

CHAPTER 4

RESULTS

4.1 STUDY POPULATION

The total number of women referred to Universitas Academic Hospital (UAH) urogynaecology clinic over the 5 year study period was 4574 and of these 46 (1.0%) were referred for obstetric fistula, 6 in 2013, 9 in 2014, 8 in 2015, 5 in 2016 and 18 in 2017; other 4528 were referred for other reasons and were excluded from the study.

4.2 MATERNAL CHARACTERISTICS

4.2.1 MATERNAL AGE

Age at presentation:

As summarised in Table 2, the mean age of the study population was 32 years (52.17%). The youngest was 15 years and the oldest was 48 years. Five (10.87%) of them were less than 20 years (teenagers) and 14 of them were above the age of 35 years.

Age At Presentation				
Age	Frequency	Percent	Cumulative Frequency	Cumulative Percent
15	1	2,17	1	2,17
18	1	2,17	2	4,35
20	2	4,35	4	8,7
21	2	4,35	6	13,04
22	2	4,35	8	17,39
24	1	2,17	9	19,57
25	2	4,35	11	23,91
27	3	6,52	14	30,43
28	1	2,17	15	32,61
30	3	6,52	18	39,13
31	4	8,7	22	47,83
32	2	4,35	24	52,17
33	2	4,35	26	56,52
34	2	4,35	28	60,87
35	4	8,7	32	69,57
36	3	6,52	35	76,09
37	3	6,52	38	82,61
38	3	6,52	41	89,13
39	3	6,52	44	95,65
46	1	2,17	45	97,83
48	1	2,17	46	100

Table 2: Age at presentation

Age at delivery:

The mean age at delivery was 28 years (52.17%) with 2 of them having delivered at the age of 14 years and the oldest at the age of 39 years. Six (26.10%) of them delivered above the age of 35 years.

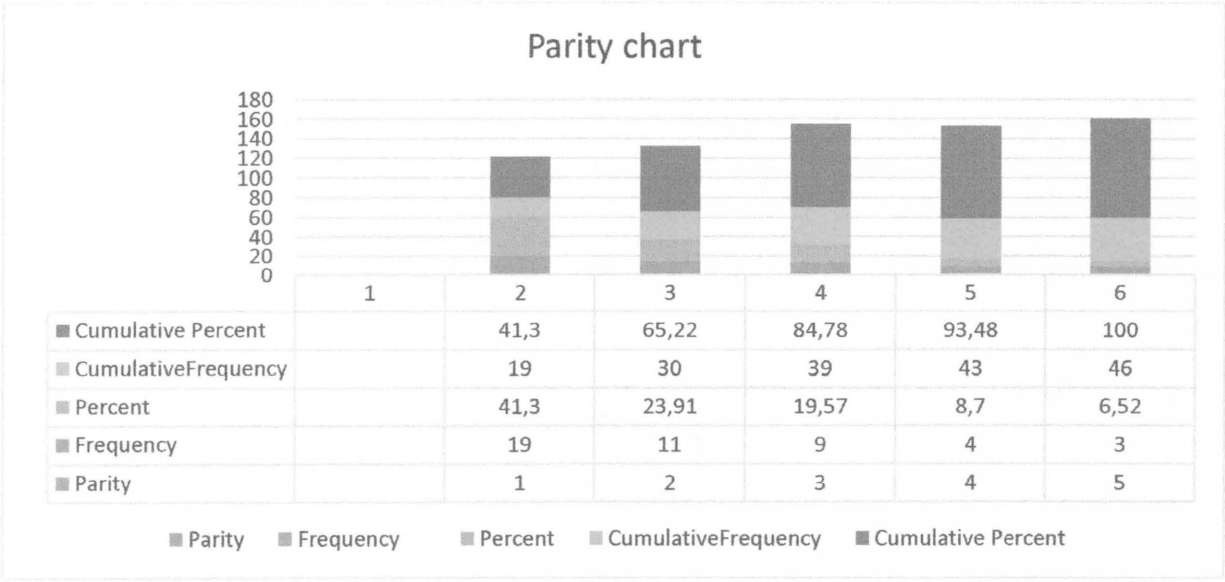
Age At Delivery				
Age At Delivery	Frequency	Percent	Cumulative Frequency	Cumulative Percent
14	2	4,35	2	4,35
17	1	2,17	3	6,52
18	2	4,35	5	10,87
19	4	8,7	9	19,57
20	3	6,52	12	26,09
22	1	2,17	13	28,26
23	1	2,17	14	30,43
24	4	8,7	18	39,13
25	2	4,35	20	43,48
26	1	2,17	21	45,65
28	3	6,52	24	52,17
29	3	6,52	27	58,7
30	3	6,52	30	65,22
31	4	8,7	34	73,91
32	1	2,17	35	76,09
33	2	4,35	37	80,43
34	3	6,52	40	86,96
35	2	4,35	42	91,3
36	2	4,35	44	95,65
37	1	2,17	45	97,83
39	1	2,17	46	100

Table 3: Age at presentation

4.3 PARITY AND GRAVIDITY

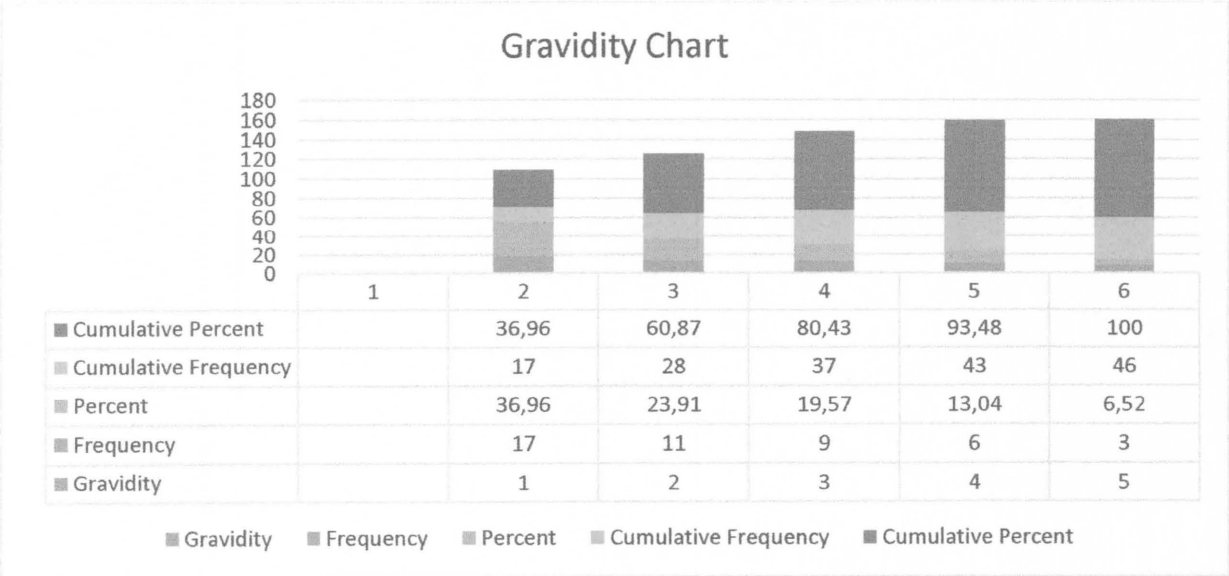
The majority of the study population were para 1 (n=19; 41.30%) and the median parity was 2 (n=30; 65.22%). More than 36% of women were primigravidas with median gravidity of 2 (n=11; 23.91%).

Figure 1: Parity Chart



	1	2	3	4	5	6
Cumulative Percent		41,3	65,22	84,78	93,48	100
CumulativeFrequency		19	30	39	43	46
Percent		41,3	23,91	19,57	8,7	6,52
Frequency		19	11	9	4	3
Parity		1	2	3	4	5

Figure 2: Gravidity Chart



	1	2	3	4	5	6
Cumulative Percent		36,96	60,87	80,43	93,48	100
Cumulative Frequency		17	28	37	43	46
Percent		36,96	23,91	19,57	13,04	6,52
Frequency		17	11	9	6	3
Gravidity		1	2	3	4	5

4.4 BODY MASS INDEX (BMI) AND RVD STATUS

The majority of the study population were overweight with their BMIs more than 25 and 4(8.70%) them had their BMI less than 20, meaning they were underweight.

Figure 3: BMI Chart

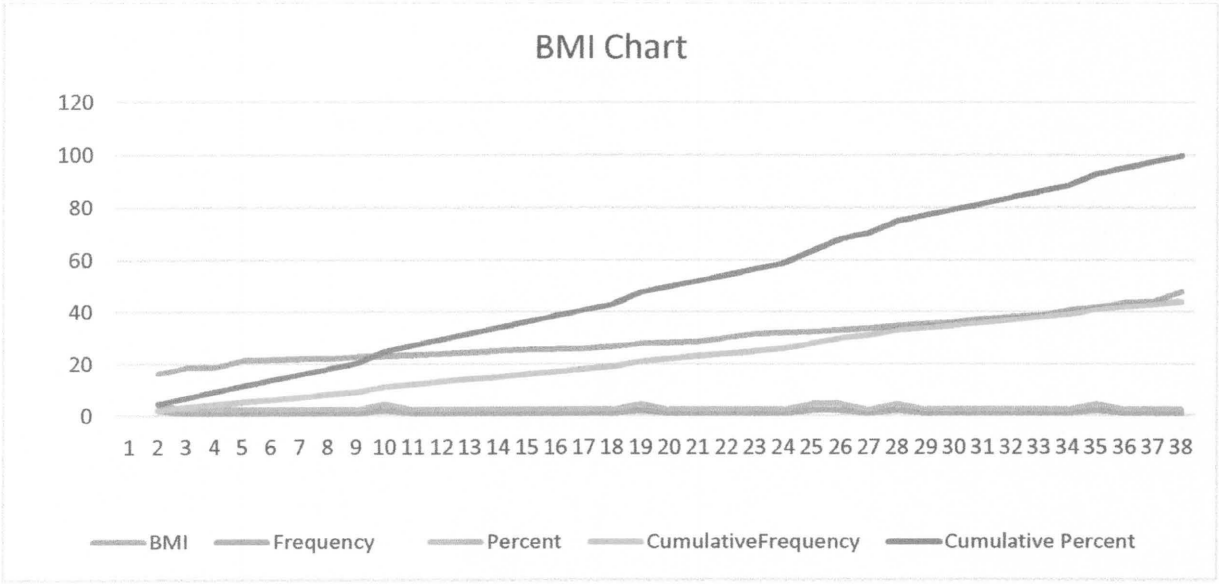
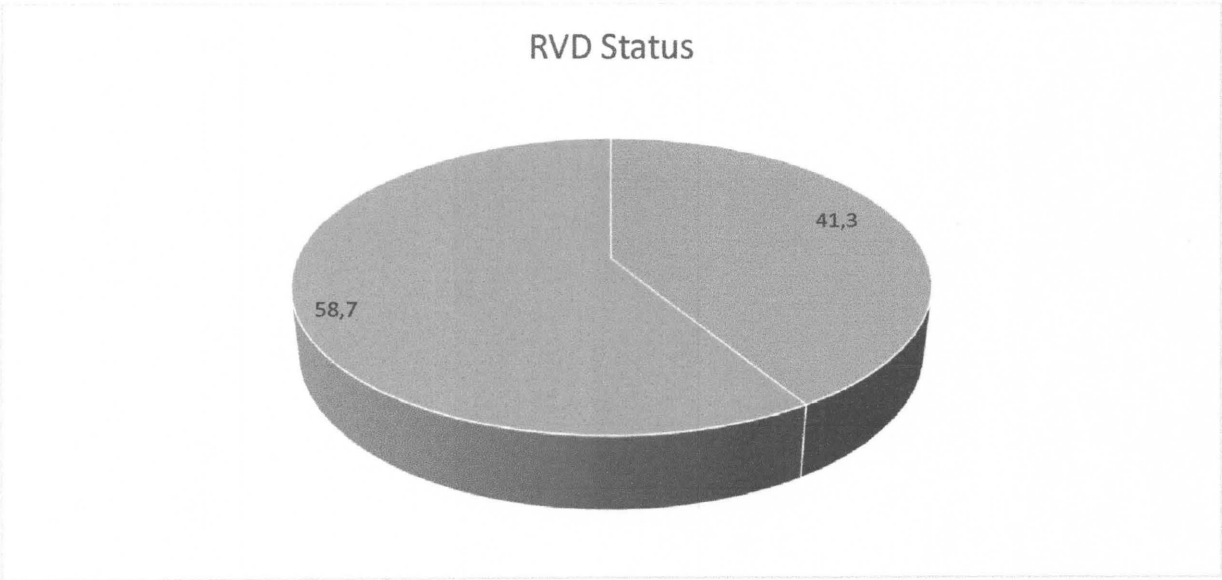


Figure 4: RVD Status



All the participants were tested for retroviral disease, 19 (41.30%) were positive and the rest of them were negative (58.70%).

4.5 EDUCATION, OCCUPATION AND MARITAL STATUS

Education:

Twenty nine (63.04%) of the study population had high school level education, and only one (2.17%) had tertiary qualification. The rest had primary school education and they constituted 34.78% of the study population.

Occupation:

Most of them were unemployed (n=42; 91.30%) and only 4 (8.7%) were working.

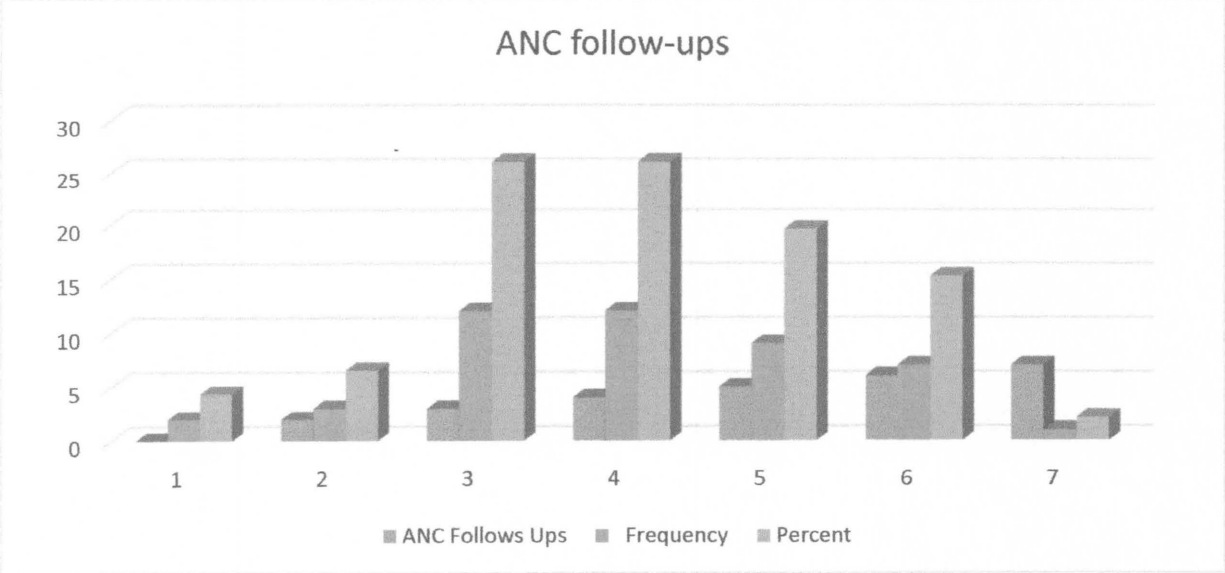
Marital status:

Fifty percent (n=23) were not married and out of the remaining 50% only 2 (4.35%) of them were divorced.

4.6 ANC FOLLOW-UPS, DURATION IN LABOUR AND PLACE OF DELIVERY

Two of the participants did not seek antenatal care at all. The median number of ANC follow-up was 4 (63.04% of the participants) and one of the participants had 7 ANC follow-ups and she also booked very early, she was 6 weeks pregnant when she booked

Figure 5: ANC Follow-ups



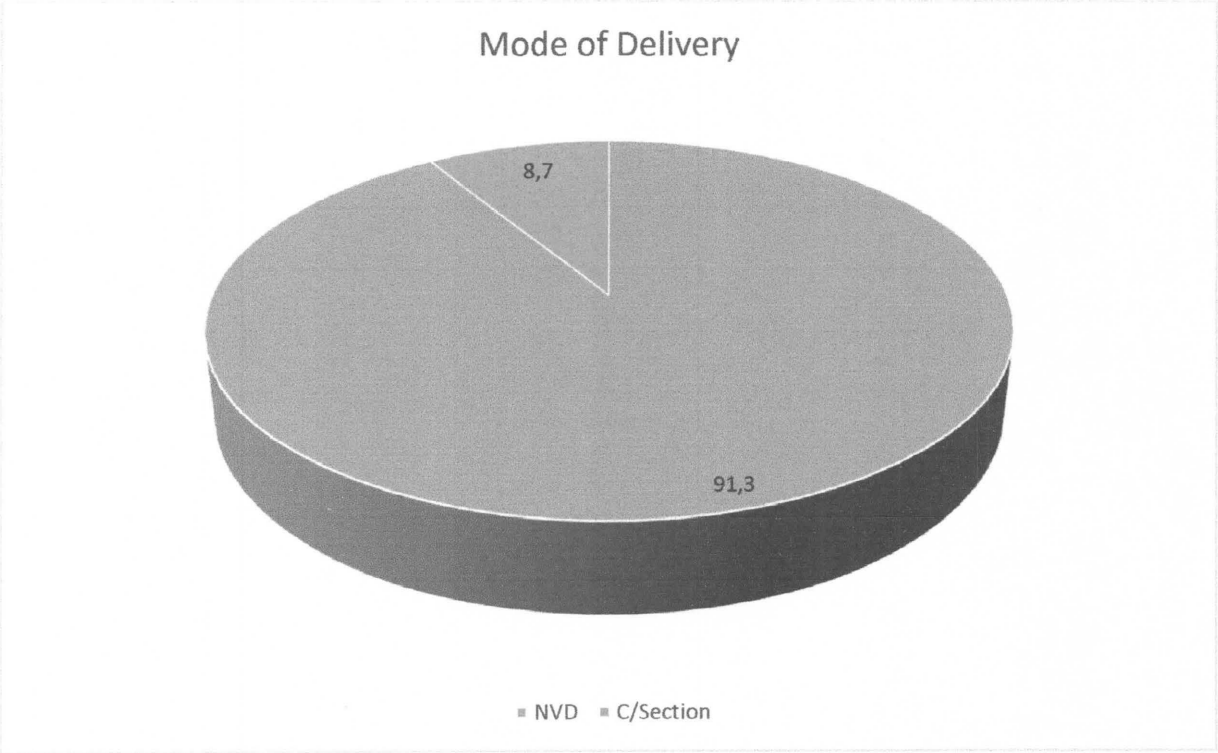
Nine of the participants had their labour lasting for less than 8 hours and 4 of them were in labour for than 24 hours. The mean duration in labour was 16 hours.

Thirty eight (82.61%) of them delivered at level 2 hospitals, 6 (13.04%) at level 1 facilities and only 2 (4.35%) of them at a level 3 facility. No-one in this population group delivered at home.

4.7 MODE OF DELIVERY, ASSISTED NVD, EPISIOTOMY AND PERINEAL TEARS

Forty two (91.30%) of the population group delivered normally and out of that 42, 4 (9.52%) of them had assisted delivery. Ten of them had episiotomies cut and all the episiotomies were sutured.

Figure 6: Mode of delivery



Out of 46 participants 33(71.74%) of them sustained perineal tears and only 29 them reported that they were repaired.

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