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Sexual function among middle-aged women attending primary health care facilities in Dr Kenneth Kaunda District, South Africa

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A research report completed by publishable article, submitted to the School of Clinical Medicine, Faculty of Health Sciences, University of the Witwatersrand, in partial fulfilment of the requirements for the degree of Master of Medicine in Family Medicine

(M.Med in Fam. Med)

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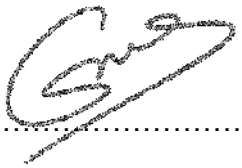
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Johannesburg 2020

Declaration

I, Moto Ahemeke Guyguy Mbonda, hereby declare that this research is my own unaided work, except where due acknowledgement for assistance received has been made. It is being submitted for the degree of Master of Family Medicine at the University of the Witwatersrand, Johannesburg. It has not been submitted previously for any other degree or examination at this or any other University.



Signed ……

(Signature of candidate)

Date: 05 July 2021



Signed **……**

(Supervisor)

Date: 05 July 2021

Acknowledgement

A great thanks to all my lecturers and supervisors in the department of Family Medicine, Witwatersrand University. To the Dr Kenneth Kaunda and the Maquassi-Hills Subdistrict management. My acknowledgement also goes to patients who accepted to participate to the study as well as to mature female nurses. Double thanks to my supervisor Madame Deidré Pretorius for accommodating me through her very busy time, day, and night even during weekends, guiding my steps through the research process with dedication and passion despite the hard times.

Dedication

I would like to dedicate this paper firstly to my God, the Almighty for the breath of life and the gracious opportunity he gave to me to be part of the programme; secondly to my family for all these years of privation and sacrifices that they suffered in order to allow me to focus and come to the end of this work and thirdly to my late supervisor, Dr Edrone Rwakaikara who committed herself and encouraged me to embrace the topic of this paper. May her soul rest in peace. We have a great faith that by the grace of God, we might meet again after this short period of our journey on earth.

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Nomenclature

QoL	Quality of life
SD	Sexual dysfunction
SDD	Sexual dysfunction disorder
FSFI	Female Sexual Function Index
PSD	Personal sexual distress
PHC	Primary health care
CHC	Community Health Centre
BMI	Body mass index
Hypertension	HTN
DM	Diabetes mellitus
DCST	District clinical specialist team

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This article was prepared according to the Author guideline of the **African Journal of Primary Health & Family Medicine and the title is changed to:**

Sexual function among middle-aged women attending primary health care facilities in Dr Kenneth Kaunda District, South Africa

Abstract

Background: South African studies have demonstrated that the proportion of rural women living with sexual dysfunction is unknown.

Aim: To determine the proportion of women living with sexual dysfunction and factors associated with it.

Setting: This study was conducted at two rural primary care facilities in Dr Kenneth Kaunda District, North West Province, South Africa.

Methods: A cross-sectional study was conducted with 276 women aged 40 - 65 years from July to October 2017. The Female Sexual Function Index-19 with a cut-off score of ≤ 26.55 was used to assess sexual dysfunction. Sexual dysfunction disorder was defined as a combination of low female sexual function index (FSFI) score and personal sexual distress.

Results: One hundred eighty-two (66%) of the women analysed lived with sexual dysfunction and 85 (30.8%) with sexual dysfunction disorder. Only 8 (3%) of the total sample demonstrated a good sexual desire. Diabetes and hypertension were significant independent predictors of female sexual disorder ($p < 0.05$).

Conclusion: Many middle-aged women experience poor sexual functioning, which can have a detrimental effect on their quality of life. It is important that Primary Care professionals

actively screen for sexual functioning in women aged 40 - 65 years, especially those living with diabetes and hypertension. There is a need for advocacy for policy changes in South African primary care to include sexual function screening in middle aged women, particularly those with hypertension and diabetes.

Key words: Middle age, women, sexual function, Diabetes, Hypertension, Primary care.

Introduction

Sexual life for women does not end with aging. Globally studies have shown that middle aged women and even those older, in good or poor health, considered sexual health to be important component of quality of life (QoL).[1,2] In the past two decades, literature has demonstrated that the interest in female sexual function is increasing.[3,4] Simply defined as the ability of a female to respond to sexual encouragement, female sexual function is related to a complex emotional, neuromuscular, endocrine and vascular interaction that regulate the female response to sexual stimuli.[5,6,7] Unfortunately, this complex response may get distorted by sociodemographic and psychological factors, menopausal status, communicable and non-communicable diseases, in isolation or in combination, leading to sexual dysfunction (SD).[8,9,10]

Chen et al.[11] referred to SD as difficulties that occur during the sexual response cycle that prevent a person from experiencing satisfaction from sexual activity. This study favours the diagnostic approach of Latif[12] and Bassan[13], in which the diagnosis of sexual dysfunction disorder (SDD) requires the presence of low Female Sexual Function Index (FSFI) score secondary to a recurrent or persistent problem with sexual desire, sexual arousal, sexual orgasm and/or pain associated with personal sexual distress (PSD) which may rise from the patient and/or her intimate partner.

Despite the prevalence of female patients living with sexual challenges, researchers suggest that primary care doctors fail to provide sexual healthcare services meeting the needs of these middle-aged patients.[14,15,16] Common barriers identified inhibiting sexual health screening were on the one hand, women feeling uncomfortable or embarrassed initiating conversations with regards to sexual complaints; and on the other hand, primary healthcare doctors claiming inadequate training in sexual management, sociocultural and personal beliefs conflicts as well as inadequate referral services.[17,18] Furthermore, the increase of chronic diseases which appear within middle age preclude the focus on patients' sexual concerns. Research has shown that when sexual issues are unattended to, individuals are at

risk of having low self-esteem, marked distress and interpersonal difficulties, which then result in poor control of daily chronic disease comorbidities, condemning them to continued poor QoL. [19] The awareness of the interaction between SDD and poor QoL has led to a growing interest on the middle aged women sexual function.[20,21]

Data available on the prevalence of female sexual dysfunction (FSD) is highly variable. A Brazilian cross-sectional study found a prevalence of SD of 67% among women aged from 40 to 65 years, using FSFI with globally accepted cut- off score of ≤ 26,55.[22] In parallel, a cohort study in Chile, involving healthy women attending the Southern Metropolitan Health Service, aged from 40 to 64, found a prevalence of SD in 51.3% of the 423/534 (79.2 %) sexually active participants.[23] Furthermore, a multicentre Latin American study including healthy women aged 40 to 59 found a SD prevalence varying from 21% to 98.5%. [24] While in Turkey, three Family Health Centres estimated the prevalence of SD at 59.7 % for women between 35 and 65.[25]

In a South African study in the rural Limpopo province, Ramakuela et al[26] found that 50% of menopausal women experienced SD symptoms. This proportion increased with age and more than 50% of the sample experienced changes in sexual desire and tended to avoid intercourse. Ramakuela et al[27] also found in a qualitative study that menopausal women, besides experiencing pain during intercourse due to vaginal atrophy and dryness, observed culture and myths that made them avoid sexual intimacy, because they believed it was detrimental and fatal to them as they have stopped menstruating. As a result, sexual intimacy was considered wrong and/or forbidden.

The researcher's encounters with middle aged women in daily practice have revealed that most these women have never been counselled about the effect of sociodemographic factors, chronic communicable and non-communicable diseases on the female reproductive system and the natural development of sexual functioning throughout time. In addition, from patient disclosure, it seemed, most of these middle-aged women had concerns and experienced

tension in their relationship/marriages, because they could not cope sexually as they had before. Also, to the best of the researcher's knowledge, there is scant literature in South Africa about FSD focusing on middle aged women's sexual function and its associated deterioration and changes. [26,27,28]

This research aimed to measure female sexual function among women aged between 40 - 65 years attending two primary health care (PHC) facilities in Maquassi Hills, Dr Kenneth Kaunda health district in North West Province. To meet this aim, the researcher described the patient profile and determined the proportion of female patients who lived with SD and SDD. The researcher also explored and compared factors that were associated to SD and SDD.

Methods

Study design and setting

A cross sectional study was undertaken during the period July to October 2017. This study took place in Maquassi Hills subdistrict, one of the three local municipalities of Dr Kenneth Kaunda District municipality, North West Province, South Africa. The languages predominantly spoken in this subdistrict were Setswana (71,7%) and Afrikaans (10.6%). The remainder included Sesotho, IsiXhosa, English, IsiZulu speaking participants. The population was mainly rural, living in the townships or informal settlements and had an unemployment rate of 33.4%.[29] The subdistrict had six primary health care (PHC) facilities, two community health care centres (CHCs) and one district hospital.

Study population and sampling strategy

A total of 3135 female patients aged 40 - 65 attended the two clinics over a twelve-month period, according to the subdistrict's statistic as at 28 February 2016.[30] One thousand nine hundred eighty-three patients attended Tswelelang 2 Community Health Centre (CHC) while 1152 attended Segametsi clinic with a proportion of 63% and 37% respectively. The sample size was calculated as 222 women with 5% error margin, and a 95% confidence interval. The sample was increased to 333 to improve the power to detect the difference between sexual dysfunction and normal sexual function by 50%. Convenience sampling was used by including clinics where the researcher served as doctor. His familiarity with the clinics' staff and operational routine eased the research's process. The distribution of the sample was 210 for the Tswelelang 2 CHC and 123 for the Segamestsi Clinic based on a proportion of the average number of patients frequenting these clinics.

Data collection tool and method

The research tool encompassed two parts. The first covered the sociodemographic and clinical health variables based on the potential risk factors that affect middle-aged female sexual function such as age, menstrual, marital and employment status, level of education and body mass index (BMI). The latter was collected from the patient's files as well as comorbidity such as hypertension (HTN), diabetes mellitus (DM) and HIV status which were identified in research as factors influencing SD[31,32] The second part dealt with the measuring of the key components of female sexual function, using the Female Sexual Function Index- 19 (FSFI- 19) which is known to have an excellent internal reliability (Chronbach's Alpha > 0.9 for all sub-scales) and a good test re-test reliability. [33] It contains 19 questions related to the six domains of female sexual function (desire, arousal, lubrication, orgasm, satisfaction, and pain during intercourse). A score of ≤ 26.55 was interpreted as low FSFI while the score above 26.55 was considered as high/normal FSFI.[34,35] The globally used sexual dysfunction assessment tool considered women with low FSFI score as having sexual dysfunction and those having a combination of sexual dysfunction with sexual distress as having sexual dysfunction disorder,[35]

Women with capacity to consent, speaking English or other local languages and those with a partner were included in the study. Participants were given the information sheet and written consent form, whereafter they completed the questionnaires. Women who were very ill and needed immediate care or had a history of hysterectomy or oophorectomy or use of antipsychotic medication were excluded.[36,37] Women using hormonal contraception or hormone replacement therapy were also excluded as these medications are known to interact with the sexual response. [38,39]

Participants were recruited by a research assistant announcing the study information in both English and Setswana while waiting to be seen by the primary health care sister or doctor. The trained research assistant was an independent health care qualified professional, selected for her professionalism as she could confidently and respectfully discuss the participants' sexual functioning and maintain confidentiality. Patients interested in participating to the study were taken out of the line to check if they complied with the inclusion and exclusion criteria, followed by one on one explanation of the study. Those who chose to participate completed the self-administered questionnaire, while those who were not literate or expressed that they did not feel confident in completing the questionnaires themselves, were assisted by the research assistant. After completion of the questionnaires, patients returned to their original place in the queue to consult the doctor. The completed questionnaires were kept safe in a locked drawer and later captured in the spreadsheet for analysis.

Statistical Analysis

Data collected from participants were captured on Microsoft Excel and the statistical analyses were conducted with SPSS version 25. A Chi-square test, correlation and logistic regression were used appropriately to measure association between variables. A *p*-value of less than 0.05 was statistically significant.

Ethical consideration

Ethical clearance was granted by the Human Research Ethic Committee (Medical) of the university of the Witwatersrand, Johannesburg (M170201), on the 24 February 2017. Permission was obtained from the subdistrict and District to conduct research at the two clinic sites. Questionnaires were completed anonymously, and raw data were password protected

Results

A total of 796 women aged 40 - 65 years were approached in the two clinics during the study period. Three hundred and thirty-one (41.6%) women declined the invitation. One hundred and thirty-two out of 465 willing participants (28.4%) were excluded based on exclusion criteria. Thirty- two (6.9%) others were excluded on review due to missing data components and another 25 (5.4%) had incomplete consent forms. Therefore, only 276 (59.4%) questionnaires were analysed, of which 178 (64%) were from Tswelelang 2 CHC and 98 (36%) from Segametsi clinic.

The mean age of the participants was 50.55 years, with 83/276 (30%) falling in the age category of 40 - 45. An overview of the sociodemographic and clinical characteristics of participants is presented in Table 1.

Table 1: Sociodemographic and clinical characteristics of participants

Nr	Variable	Values
1	Ages (years)	
	Means ± SD	50.55 ± 7.07
	Age groups	Number (%)

	40- 45	83 (30)
	46- 50	64 (23)
	51- 55	58 (21)
	56- 60	44 (16)
	61- 65	27 (10)

2	Menstruation status	Number (%)
	Regular menstruation	50 (18)
	Irregular menstruation	65 (24)
	No Menstruation ≥ 1 year	161 (58)

3	Marital Status	Number (%)
	Married	150 (54)
	Not married	126 (46)

4	Level of education	Number (%)
	None	54 (20)
	Primary	117 (42)
	Secondary	98 (35)
	Tertiary	7 (3)

5	Employment Status	Number (%)
	Employed	72 (26)
	Unemployed	204 (74)

6	BMI	Number (%)
	Means ± SD	29.99 ± 8.12
	Underweight (<18.5)	11 (4)
	Normal weight (18.5- 24.99)	77 (28)
	Overweight (25- 29.99)	62 (22)
	Obese (30- 39.99)	88 (32)

	Morbid obese ≥ 40	38 (14)	328
			329
7	Morbidity	Number (%)	
	Hypertension (HTN)	117 (42)	330
	Diabetes Mellitus (DM)	8 (3)	331
	HIV	62 (22)	332
	HTN & DM	26 (9)	
	HTN & HIV	22 (8)	333
	DM & HIV	4 (1)	334
	DM & HTN & HIV	1 (0)	335

336

337 After the assessment of individual FSFI score, sexual distress, sexual desire disorder and
338 sexual desire domain score, 182(66%) participants had a low FSFI score, 85 (30.8%) had a low
339 FSFI and personal sexual distress, therefore presenting with SDD and only eight (3%) of the
340 total sample had good sexual desire. A summary of female function and PSD is presented in
341 Table 2.

342

343 **Table 2**: Summary Female Sexual Function and Personal Sexual Distress

Nr	Variables	Values
1	**FSFI score**	**Number (%)**
	Low ≤ 26.55	182 (66)
	Normal > 26,55	94 (34)
2	**Personal Sexual distress**	**Number (%)**
	No	189 (68)
	Yes	87 (32)
	Normal FSFI score	2 (2)
	Low FSFI score	85 (98)

3	SDD	Number (%)
	Low FSFI score with sexual distress	85 (30.8)
	Low FSFI score without PSD	97 (35.1)

4	Desire (Sexual domain)	Number (%)
	With HSDD (score ≤ 5)	268 (97)
	Without HSDD (score > 5)	8 (3)

FSFI: Female Sexual Function Index

HSDD: Hypo active Sexual Desire Disorder

344

345 The association of the potential risk factors with the outcomes of interest depicted in Table 3
346 has shown that menstrual status, level of education and employment status were statistically
347 and significantly associated with low FSFI score. Employment status was significantly
348 associated with sexual distress and not with SDD.

349

350 **Table 3**: Association between sociodemographic risk factors sexual functioning

Variables	Low FSFI Score		Personal Sexual Distress		SDD	
	χ^2	P value	χ^2	P value	χ^2	P value
Menstruation status	4.073	**0.044**	0.350	0.554	0.408	0.523
Marital Status	1.086	0.297	2.211	0.137	2.308	0.129
Level of education	23.199	**0.000**	3.630	0.304	3.520	0.318
Employment status	11.024	**0.001**	3.903	**0,048**	3.361	0.067

351 The association of potential risk factors with the outcomes portrayed in Table 4 revealed that
352 age, menopausal status, and comorbidity (DM and HTN) correlated positively and significantly

353 with low FSFI score. Both education level and employment status correlated negatively and
354 significantly with low FSFI score.

355

356 The comorbidity (DM and HTN), as well as employment status, showed a significant
357 association with PSD, and from the two factors, only DM and HTN comorbidities
358 demonstrated a positive and significant correlation with SDD.

359

360 **Table 4**: Association of anthropometric measures, sociodemographic and clinical factors
361 with Low FSFI, PSD and FSD

Variables	**Low FSFI score**	**Personal Sexual Distress**	**SDD**
Age	273	0.093	0.103
	0.000	0.124	0.088
BMI	-0.030	0.026	0.045
	0.617	0.664	0.460
HTN	0.060	- 0.045	-0.048
	0.324	0.452	0.425
DM	-0.013	0.069	0.072
	0.836	0.255	0.234
HIV	-0.108	-0.048	-0.058
	0.074	0.432	0.335
HTN & DM	0.147	0.139*	0.145
	0.015	**0.021**	**0.016**
HTN & HIV	0.78	-0.063	-0.059
	0.194	0.293	0.327
Stopped menstruation ≥ 1 year	0.121	0,036	0.038
	0.044	0.556	0.524

Education	-0.275	-0.111	-0.109
	0.000	0.065	0.071
Employed	-0.200	0.119*	-0.110
	0.001	**0.048**	0.067

The logistic regression analysis is presented in Table 5. Age, menopause status and comorbidity (DM and HTN) significantly and positively contributed to low FSFI score. In other words, for each year increased in the middle-age bracket, the odds of low FSFI increased by approximatively by 1,1 times. Being menopausal increased the odds of low FSFI by approximately by 1.7 times. Moreover, having the comorbidities (DM and HTN) increased the odds of having low FSFI by approximately 4.2 times. The level of education and employment decreased the odds of having low FSFI, except for the primary level education. Having secondary or tertiary level of education reduced the odds of low FSFI by approximately 75% and almost 80% respectively. Being employed demonstrated a reduction of approximately 60% in the risk of low FSFI.

In addition, from all the aforementioned factors, only the comorbidities (DM and HTN) demonstrated a significant and positive association with PSD and SDD. In another words, having comorbidities (HTN and DM) in the middle age bracket increased the odds of PSD and SDD by 2.6 and 2.7 respectively.

Table 5: Logistic Regression: contribution of studied factors to low FSFI, PSD and FSD

	Categories	**Low FSFI score**		**PSD**		**SDD**	
		P-value	Odd ration	P-value	Odd ratio	P-value	Odd ration
Age (years)		**0.000**	1.094	0.118	1.029	0.086	1.032
Menstrual status	No menstruation ≥ 1 year	**0.044**	1.676	0.554	1.169	0.523	1.185

Level of education	None		0	0.318		0.330	
	Primary	0.527	0.776	0.480	0,786	0.636	0.850
	Secondary	**0.000**	0.246	0.116	0.567	0.138	0.582
	Tertiary	**0.048**	0.192	0.230	0.262	0.259	0.283
Employment status	Employed	**0.001**	0.397	0.050	0.535	0.069	0.559
Morbidity	HTN	0.323	1.292	0.450	0.819	0.424	0.808
	DM	0.835	0.857	0.265	2.229	0.245	2.309
	HIV	0.075	0.591	0.430	0.777	0.335	0.731
	HTN DM	**0.023**	4.171	**0.025**	2.591	**0.019**	2.693
	HTN HIV	0.200	1.954	0.297	0.579	0.330	0.601

Two hundred sixty-eight (97%) participants had scores associated with Hypoactive Sexual Desire Disorder (HSDD) and only 8 (3%) participants had good sexual function.

Discussion

This research investigated female sexual function and risk factors associated with SD among women aged 40 - 65 years attending two primary care facilities in Maquassi Hills subdistrict, Dr Kenneth Kaunda District, North West Province, South Africa.

Sixty-six percent of women analysed in the study were found to be living with SD and 30.8% with SDD. The proportion of SD was in agreement with findings of Cabral et al.,[22] and slightly higher than the literature estimate which varies between 25- 63%.[40,41] The combination of DM[42,43] and HTN,[44,45] both conditions known for vascular and neural complications, was evident in this study as factors associated with SD and SDD. Age and menopause status were

associated with SD in this study. According to literature, the decline of sexual function in middle-aged women is a consequence of overall deterioration in general health, physical, and medical condition and not solely the effect of aging and menopause.[8,45] Although unexplored in this study, previous poor health, social and cultural status, and former level of physical and sexual activities can also contribute to high prevalence of SD. ,[47,48]

Despite the high number of factors associated with sexual dysfunction and its prevalence in middle-aged women, evidence globally and locally demonstrated that patients using primary care facilities seldom complained about sexual functioning difficulties.[18,49,50] Therefore, one may ask why women living with SD rarely complain about it to the doctors? The answer to this question is quite complex. Some literature affirms that help seeking is linked to employment and education.[51,52,53] Educated and/or employed women were abler to identify a sexual problem, and therefore more prone to reporting it and seeking medical attention for it.

Women who were less educated or were unemployed have little access to information and resources, and remain unaware that their sexual difficulties constitute a medical condition that can be reported to and managed by their doctor as for any other illness.[54] This may explain the silence observed during our daily consultations with these women on the topic of sexual functioning, since the majority of our participants had a low education and high unemployment back ground.

Furthermore, health and education systems can be barriers to screening. Doctors fail to screen for SD for various reasons, such as time constraints, lack of privacy, fear of embarrassment, doctor-patient difference in age, gender and culture, as well as lack of knowledge and skills.[14,15,18] Patients, however, welcome questions regarding their sexual challenges, but often refrain from raising the problem themselves, as they failed to get help in the past. [55,56,57] Thus, if doctors or PHC professionals do not proactively address sexual challenges in patients, unattended SD may result in further negative effects. These can

include relationship conflict, anxiety, depression, fear of sex, poor management of chronic diseases, and sexually transmitted diseases (STD), as their partners may seek refuge in other women due to sexual frustration. This situation may lead for the women to further anxiety and SDD.[58,59,60,61]

To prevent this malicious situation, middle-aged women, especially those with HTN and DM comorbidities, need to be screened for SD and SDD in the primary care setting. Ramakuela et al.[27] argued that some of menopausal symptoms may be temporary. Therefore, providing the patient and her understanding partner with the necessary information through counselling may be all that is required to resolve their sexual frustrations.

Other authors worldwide and in South Africa found that most sexual health policy and planning programmes focus on family planning, safe termination of pregnancies, maternity services, screening and management of reproductive system cancers, prevention and management of STDs (including HIV/AIDS), and so forth, with little attention paid to SD.[18,31,62] Furthermore, tertiary training of doctors does not integrate sexual health in the curriculum as a key factor of general health and well-being.[18,63,64]

Guidelines for the management of HTN and DM as comorbidity should include screening for sexual functioning, as it does not only ensure sexual wellbeing and indirectly good QoL, but also makes doctors more aware of the neurovascular complications associated to these conditions and their biopsychosocial influence on patient lives.

Cohen and Cohen[65] already suggested in 1985 that Family Physicians invite patients to discuss their sexuality, provide information and discuss strategies to enhance intimacy. This is however still a problem. Hence, this paper is again an opportunity for us to reiterate the call to Family Physicians as members of the district clinical specialist team (DCST) and team leaders for the PHC re-engineering process to fully play their role in meeting the unique needs of individual middle-aged women regarding sexual function.[66,67] They need to create awareness in the health care system, the health district and province, stakeholders and to

decision makers. Moreover, they should advocate for the population at risk and create an awareness of risk factors associated with SD and SDD and negotiate the inclusion of the female patient's sexual difficulties in policies and guidelines. Healthcare providers must be patient-focussed rather than disease focussed, in order to help the patient to discuss and understand her illness, and get an agreement on options available for her management through the health care system.

Study limitations

The questionnaire used to measure the female sexual function was not validated in South Africa, but due to its global use, SADEC and BRICS countries accept the use this tool. It was supposed to be self-administered; however, some participants were assisted, which could lead to the under or over reporting of symptoms. The study took place in two clinics out of eight clinics in Maquassi Hills, thus the results may not be applicable to the whole health district.

Conclusion

Sexual dysfunction in middle-aged women is a reality in our clinics that doctors often fail to explore and manage. It is unlikely that patients will raise these challenges during the consultation. Therefore, a healthcare professional should actively screen for SD in any patient with risk factors, inform them of the help available and refer appropriately to a Family Physician, sexual therapist, marriage counsellor, psychologist and/or clinical social worker. By ignoring SD, the health system exposes women with SD to a cycle of stress, abandonment, and relationship tension that affects their QoL. In addition, Family physicians as experts and leaders in PHC must advocate for policy changes regarding the inclusion of sexual function screening in middle aged women.

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Article requirements

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Appendices

Appendix I: Questionnaire

Date:

Clinic:

Patient code: **Final score:** ☐

Instruction to be read to the patient:

The questions I am going to ask you are about your sexual feelings and responses during the past four weeks to enable the researcher to find which aspect in the lives of women at your age are associated with good sexual experience and what is considered to be stressful in bad sexual experiences.

At Segametsi clinic and Tswelelang 2 Community Health Care. Thus I am expecting you to answer as clearly as and honestly as possible.

9.2.1. Socio-demographic and health status

Serial number: ☐ **Age (years): ……..**

Menopause status, are your menstruations: ☐

Regular ☐ **Irregular or stopped ≥3 months but < 12/12** ☐ **Post (no menses ≥ 12/12)** ☐

Marital status: Married ☐ **Stable relationship** ☐ **Having a partner** ☐

Education level: Primary ☐ **Secondary** ☐ **Tertiary** ☐

Employment status: Employed ☐ **Unemployed** ☐

Weight: …… (Kg) **Height: …….. m** **BMI (kg/m^2):** **……**

Ethnicity: Black African ☐ **coloured** ☐ **white** ☐ **Indian** ☐ **other** **……**

Co-morbidity: Hypertension ☐ **Diabetes** ☐ **HIV** ☐ **Other (s)……**

9.2.2. Female sexual function index- 19 (FSFI- 19)

Domaine 1

Desire/interest: feeling of willing to have sexual experience, thinking or fantasizing about having sex or feeling receptive to a partner's sexual initiation

1. How often did you feel sexual interest/desire over the past 4 weeks?

☐ 5 = Almost always or always

☐ 4 = Most times (more than half the time)

☐ 3 = Sometimes (about half the time)

☐ 2 = A few times (less than half the time)

☐ 1 = Almost never or never

2. How would you rate your degree/level of sexual desire/interest over the last four weeks?

☐ 5 = Very high

☐ 4 = High

☐ 3 = Moderate

☐ 2 = Low

☐ 1 = Very low or none at all

Domain 2

Sexual arousal is a feeling that includes both physical and mental aspects of sexual excitement. It May include feelings of warmth or tingling in the genitals, lubrication (wetness), or muscle contractions.

3. Over the past 4 weeks, how often did you feel sexually aroused (“turned on”) during sexual activity or intercourse?

☐ 5 = Almost always or always

☐ 4 = Most times (more than half the time)

☐ 3 = Sometimes (about half the time)

☐ 2 = A few times (less than half the time)

☐ 1 = Almost never or never

☐ 0 = No sexual activity

4. Over the past 4 weeks, how would you rate your level of sexual arousal (“turn on”) during sexual activity or intercourse?

☐ 5 = Very high

☐ 4 = High

☐ 3 = Moderate

☐ 2 = Low

☐ 1 = Very low or none at all

☐ 0 = No sexual activity

5. Over the past 4 weeks, how confident were you about becoming sexually aroused during sexual activity or intercourse?

☐ 5 = Very high confidence

☐ 4 = High confidence

☐ 3 = Moderate confidence

☐ 2 = Low confidence

☐ 1 = Very low or no confidence

☐ 0 = No sexual activity

6. Over the past 4 weeks, how often have you been satisfied with your arousal (excitement) during sexual activity or intercourse?

☐ 5 = Almost always or always

☐ 4 = Most times (more than half the time)

☐ 3 = Sometimes (about half the time)

☐ 2 = A few times (less than half the time)

A☐ 1 = Almost never or never

☐ 0 = No sexual activity

Domaine 3: Lubrication

7. Over the past 4 weeks, how often did you become lubricated (“wet”) during sexual activity or intercourse?

☐ 5 = Almost always or always

☐ 4 = Most times (more than half the time)

☐ 3 = Sometimes (about half the time)

☐ 2 = A few times (less than half the time)

☐ 1 = Almost never or never

☐ 0 = No sexual activity

8. Over the past 4 weeks, how difficult was it to become lubricated (“wet”) during sexual activity or intercourse?

☐ 5 = Not difficult

☐ 4 = Slightly difficult

☐ 3 = Difficult ☐ 2 = Very difficult ☐ 1 = Extremely difficult or impossible

☐ 0 = No sexual activity

9. Over the past 4 weeks, how often did you maintain your lubrication (“wetness”) until completion of sexual activity or intercourse?

☐ 5 = Almost always or always

☐ 4 = Most times (more than half the time)

☐ 3 = Sometimes (about half the time)

☐ 2 = A few times (less than half the time)

☐ 1 = Almost never or never

☐ 0 = No sexual activity

10. Over the past 4 weeks, how difficult was it to maintain your lubrication ("wetness") until completion of sexual activity or intercourse?

☐ 5 = Not difficult

☐ 4 = Slightly difficult

☐ 3 = Difficult

☐ 2 = Very difficult

☐ 1 = Extremely difficult or impossible

☐ 0 = No sexual activity

Domaine 4: Orgasm

11. Over the past 4 weeks, when you had sexual stimulation or intercourse, how often did you reach orgasm (climax)?

☐ 5 = Almost always or always

☐ 4 = Most times (more than half the time)

☐ 3 = Sometimes (about half the time)

☐ 2 = A few times (less than half the time)

☐ 1 = Almost never or never

☐ 0 = No sexual activity

12. Over the past 4 weeks, when you had sexual stimulation or intercourse, how difficult was it for you to reach orgasm (climax)?

☐ 5 = Not difficult

☐ 4 = Slightly difficult

☐ 3 = Difficult

☐ 2 = Very difficult

☐ 1 = Extremely difficult or impossible

☐ 0 = No sexual activity

13. Over the past 4 weeks, how satisfied were you with your ability to reach orgasm (climax) during sexual activity or intercourse?

☐ 5 = Very satisfied

☐ 4 = Moderately satisfied

☐ 3 = About equally satisfied and dissatisfied

☐ 2 = Moderately dissatisfied

☐ 1 = Very dissatisfied

☐ 0 = No sexual activity

Domaine 5: Satisfaction

14. Over the past 4 weeks, how satisfied have you been with the amount of emotional closeness during sexual activity between you and your partner?

☐ 5 = Very satisfied

☐ 4 = Moderately satisfied

☐ 3 = About equally satisfied and dissatisfied

☐ 2 = Moderately dissatisfied

☐ 1 = Very dissatisfied

☐ 0 = No sexual activity

15. Over the past 4 weeks, how satisfied have you been with your sexual relationship with your partner?

☐ 5 = Very satisfied

☐ 4 = Moderately satisfied

☐ 3 = About equally satisfied and dissatisfied

☐ 2 = Moderately dissatisfied

☐ 1 = Very dissatisfied

16. Over the past 4 weeks, how satisfied have you been with your overall sexual life?

☐ 5 = Very satisfied

☐ 4 = Moderately satisfied

☐ 3 = About equally satisfied and dissatisfied

☐ 2 = Moderately dissatisfied

☐ 1 = Very dissatisfied

Domaine 6: Pain

17. Over the past 4 weeks, how often did you experience discomfort or pain during vaginal penetration?

☐ 5 = Almost never or never

☐ 4 = A few times (less than half the time) ☐

3 = Sometimes (about half the time) ☐ 2 =

Most times (more than half the time)

☐ 1 = Almost always or always

☐ 0 = Did not attempt intercourse

18. Over the past 4 weeks, how often did you experience discomfort or pain following vaginal penetration?

☐ 5 = Almost never or never

☐ 4 = A few times (less than half the time)

☐ 3 = Sometimes (about half the time)

☐ 2 = Most times (more than half the time) ☐

1 = Almost always or always ☐ 0 = Did not attempt intercourse

19. Over the past 4 weeks, how would you rate your level (degree) of discomfort or pain during or following vaginal penetration?

☐ 5 = Very low or none at all

☐ 4 = Low

☐ 3 = Moderate

☐ 2 = High

☐ 1 = Very high

☐ 0 = Did not attempt intercourse

Thank you for your time

FSFI domain scoring and full scale score (Annexure 2.4)

Domain	Item number	Score Range	Factor	Minimum Score	Maximum score
Desire	**1,2**	**1- 2**	**0.6**	**1.2**	**6.0**
Arousal	**3,4,5,6**	**0- 5**	**0.3**	**0**	**6.0**
Lubrication	**7,8,9,10**	**0- 5**	**0.3**	**0**	**6.0**
Orgasm	**11,12,13**	**0- 5**	**0.4**	**0**	**6.0**
Satisfaction	**14,15,16**	**0(or 1)- 5***	**0.4**	**0.8**	**6.0**
Pain	**17,18,19**	**0- 5**	**0.4**	**0**	**6.0**
				2.0	**36.0**
Item 14 ranges from 0- 5 while items 15 and 16 range from 1-5					

A score of ≤ 26.55 classifies the woman as FSD while a score of > 26.55 classifies a sexually functional

Appendix II: INFORMATION SHEET AND CONSENT FORM

Study title: Sexual function among middle-aged women at two Primary Health Care facilities in Dr Kenneth Kaunda, South Africa

Dear Madam

Introduction:

My name is sister XXX, I am an Assistant/Professional nurse helping Doctor Moto Ahemeke Guyguy Mbonda for data/information collection and completion of the questionnaire regarding his research. It concerns female sexual experience in women at your age who are attending this clinic. The topic is highly sensitive and private, that he asked me to help for the interview and data/information collection.

The purpose of this research report is to determine which factors of women's life at your age are significantly associated with sexual problems/difficulties.

Invitation to participate:

You are invited to participate in this research study because you are aged between 40 and 65 years and attending a public primary health care facility.

What is involved in the study?

Your participation will consist of answering a once-off questionnaire of about 30- 50 minutes, on your socio-demographic profile and sexual life experience. If you agree to participate then I have to complete the questionnaire together with you to ascertain how good your sexual life experience is. Should it happen that we discover difficulties preventing you from enjoying full sexual life, we have then to help you if you desire so.

Risks and benefits related to participation: There is no expected direct physical, psychological and/or social risks or benefits during participation to the study.

Participation is voluntary. If for any reason, you do not wish to participate in this study or if at any stage you decide to withdraw from the questionnaire, you are free to do so since this is your right and I guarantee you that it will not affect your care as a patient. If you decide to withdraw, you may do so without providing any reason.

Reimbursements for "out of pocket" expenses. No reimbursement is expected from this study as it involves the administration of a once off questionnaire to a participant during her regular visit to the clinic.

Confidentiality: The nature of the questions are sensitive and private as they relate to your personal life. Efforts will be made to keep personal information confidential. No name or identifiers to disclose the participants' identities to a third party will be used.

Questionnaire will be given a serial number/code and the completed ones will be kept in the lockable drawer in the operational manager's office. Its keys will be kept by the principal researcher and his assistant at each clinic. Raw data without participant names will be captured by the principal investigator in a protected Excel sheet for analysis and interpretation. The researcher assistant will sign a confidentiality agreement with principal researcher to keep secret the participant information. However, for quality assurance purpose, the researcher supervisor or institutions such as Human Research Ethics Committee (HREC) and university of Witwatersrand may have access to the raw data.

The outcome of this study will be published as the sub district situation and not as individual participant information.

Contact details of principal researcher and principal researcher's supervisor – for further information / reporting of study related preoccupation, feel free to contact from 08:00 to 16:00, Monday to Friday:

- Dr Mbonda (Principal researcher) on 072 735 11 72 or ggmbonda@gmail.com
- Deidre Pretorius (Principal researcher's supervisor) on 0825553597 or DeidrePretorius@wits.ac.za

Contact details of HREC administrator and chair – for reporting of complaints / problems related to ethic.

- Professor P. Cleaton-Jones (Chairman) on 011 717 2301 or Peter.Cleaton-Jones1@wits.ac.za
- Mr Rhulani Mkasi (Administrative Officer) on 011 717 1234 or rhulani.mkansi@wits.ac.za

Consent form to participate in the research

Sexual function among middle aged women at two Primary Health Care facilities in Dr Kenneth Kaunda, South Africa

If you choose to participate. please sign below and a copy of this consent form will be given to you for your own record purposes

---

A Consent Given

I, _____ the undersigned have hereby chosen to participate in the research study entitled, **Sexual function among middle-aged women at two Primary Health Care facilities in Dr Kenneth Kaunda, South Africa**

I understand that I have the right to withdraw myself from this research at any time. after notifying verbally Dr MBONDA without providing a reason.

I am participating in the study provided that my privacy and the information that I have given to the research team (Principal researcher and research assistant) will be kept confidential.

PATIENT: _____ DATE: _____

B Consent Not Given

I, _____ do not give consent:

PATIENT: _____ DATE: _____

1036

1037

1038 **Appendix III: Ethical Clearance Certificate**

R14/49 Dr Moto Ahemeke Guyguy Mbonda

HUMAN RESEARCH ETHICS COMMITTEE (MEDICAL)

CLEARANCE CERTIFICATE NO. M170201

NAME: (Principal Investigator)	Dr Moto Ahemeke Guyguy Mbonda
DEPARTMENT:	Family Medicine Maquassi-Hills Sub-District, North West Province
PROJECT TITLE:	Sexual Function among Middle Aged Women at Two Primary Health Care Facilities in Dr Kenneth Kaunda, South Africa
DATE CONSIDERED:	24/02/2017
DECISION:	
CONDITIONS:	
SUPERVISOR:	Dr Edrone Rwakaikara and Deidre Pretorius
APPROVED BY:	Professor P. Cleaton-Jones, Chairperson, HREC (Medical)
DATE OF APPROVAL:	

This clearance certificate is valid for 5 years from date of approval. Extension may be applied for.

DECLARATION OF INVESTIGATORS

To be completed in duplicate and **ONE COPY** returned to the Research Office Secretary in Room 10004,10th floor, Senate House/3rd floor, Phillip Tobias Building, Parktown, University of the Witwatersrand. I/We fully understand the conditions under which I am/we are authorised to carry out the above-mentioned research and I/we undertake to ensure compliance with these conditions. Should any departure be contemplated, from the research protocol as approved, I/we undertake to resubmit to the Committee. **I agree to submit a yearly progress report**. The date for annual re-certification will be one year after the date of convened meeting where the study was initially reviewed. in this case, the study was initially review February and will therefore be due in the month of February each year. Unreported changes to the application may invalidate the clearance given by the HREC (Medical).

Principal Investigator Signature Date 10/03/2017

PLEASE QUOTE THE PROTOCOL NUMBER IN ALL ENQUIRIES

1039

1040 **Appendix IV: Permissions (Provincial and District approval)**

health
Department of
Health
North West Province
REPUBLIC OF SOUTH AFRICA

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MMABATHO, 2735

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Tel: 018 391 4504
NMapogo@nwpg.gov.za
www.nwhealth.gov.za

2030 NDP

RESEARCH, MONITORING AND EVALUATION DIRECTORATE

0Name of researcher: **Dr. M.A.G. Mbonda**
University of the Witwatersrand

Physical Address (Work/ Institution) 28th, Kruger Street, Wolmaransstad. National department of Health; Maquassi-Hills Subdistrict / Wolmaransstad.

Subject **Research Approval Letter – Sexual function among middle aged women at two primary health care facilities in Dr, Kenneth Kaunda District, South Africa,**

This letter serves to inform the Researcher that permission to undertake the above mentioned study has been granted by the North West Department of Health. The Researcher is expected to arrange in advance with the chosen facilities, and issue this letter as proof that permission has been granted by the Provincial office.

This letter of permission should be signed and a copy returned to the department. By signing, the Researcher agrees, binds him/herself and undertakes to furnish the Department with an electronic copy of the final research report. Alternatively, the Researcher can also provide the Department with electronic summary highlighting recommendations that will assist the department in its planning to improve some of its services where possible. Through this the Researcher will not only contribute to the academic body of knowledge but also contributes towards the bettering of health care services and thus the overall health of citizens in the North West Province.

Kindest regards.

Dr. FRM Reichel
Director: RM&E

HEAD OF DEPARTMENT
2020 -11- 27
NORTH WEST DEPARTMENT OF HEALTH
PRIVATE BAG X 2068, MMABATHO, 2735

27/11/2020
Date

Researcher

27/11/2020
Date

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MAQUASSI HILLS SUB-DISTRICT: OFFICE OF THE PHC MANAGER

13 January 2017

To: Dr Mbonda Moto Ahemeke Guyguy
Third year Registrar/ Department of Family Medicine
Student number 782456
Email: ggmbonda@gmail.com
Cell. 072 73 5 11 72

From: Ockie Sesinyi
Acting Deputy Director
Maquassi Hills Sub District

Re: REQUEST FOR APPROVAL TO CONDUCT RESEARCH STUDY.

Your letter dated the 10th of January 2017 were you requested to be granted provisional permission to conduct a research study in Tswelelang 2 Community Healthcare Centre and Segametsi Mogaetsho Clinic bears reference.

It gives us a pleasure to provisionally approve your request to conduct a research study in Tswelelang 2 Community Healthcare Centre and Segametsi Mogaetsho Clinic in the Maquassi Hills Sub district. This is based on the fact that as a third year post graduate registrar pursuing the M Med studies at Witwatersrand University you must submit research protocol, is also based on the provision that you research is grated Ethical clearance and is approved by the Dr Kenneth Kaunda and North West Provincial department of Health Research and Ethics Committees and The title of the research study is: **Sexual function among middle aged women at two Primary Health Care facilities in Dr Kenneth Kaunda, South Africa.**

The sub district hopes you find this approval in order and wish you good luck with your studies.

The Permission is provisionally granted by:

Mr I.M. Motoi
Director DHS
Dr Kenneth Kaunda District

11/11/2020
DATE

Appendix V: Turn it in report

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by Moto Mbonda

Submission date: 23-Nov-2020 12:10PM (UTC+0200)

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Appendix VI: Proofreading certificates

Proofreading certificate 1

P.O. box 885
HOUGHTON
2041
meyer.fe576@gmail.com

November 12th, 2020

ENGLISH PROOF-READING/EDITING

To Whom It May Concern

The journal article entitled, 'Sexual function among middle-aged women at two Primary Health Care facilities in Dr Kenneth Kaunda, South Africa' to be submitted by Dr G.-G. MBONDA et al has been proof-read and edited for proper English language, syntax, grammar, punctuation, British/SA spelling and overall style by F.E. MEYER. As requested, document formatting was applied to the journal article according to the guidelines for authors. The 55 references were checked according to the Vancouver referencing as per the journal's guidelines. The research content and/or the authors' intentions were not altered during the process.

Blue and yellow highlighting will require the corresponding author's attention. The date on the footnote on this page corresponds with that of the attached proof-read and edited sections of the journal article. Any further proof-reading or editing required by the author(s), due to changes or amendments to this journal article will be accompanied by an updated covering page and will replace this covering page.

F.E. Meyer

F.E. MEYER
B.A. (UNISA)

Footnote: Proof reader's/Editor's covering page

Edited journal article	*2020/11/12*	*PRET/03*

1052 **Proofreading certificate 2**

renate olinger
EDITING & PROOFREADING

Golf Club Terrace
Constantia Kloof
Roodepoort
Gauteng
1709
South Africa

3 July 2021

To Whom It May Concern,

RE: Language Editing of Manuscript to be Submitted

This letters serves as confirmation that the manuscript titled below, intended for publication in an academic peer-reviewed journal, has undergone professional language and technical editing. The following items were reviewed and corrected: spelling, grammar, punctuation, sentence structure, phrasing, referencing and overall formatting of the document.

Title: Sexual function among middle-aged women attending primary health care facilities in Dr Kenneth Kaunda District, South Africa
Author(s): Dr. M.A.G Mbonda

Copies of the manuscript with markup can be made available upon request Should you require further information, kindly contact me on renate.olinger@yahoo.com.

Yours Sincerely,

Renate Olinger
Editor & Proofreader

1053

Appendix VII: Research Proposal

Sexual function among middle-aged women at two Primary Health Care facilities in Dr Kenneth Kaunda, South Africa

By Dr Moto Ahemeke Guyguy Mbonda

Student number 782456

Supervisor: Dr Edrone Rwakaikara

Witwatersrand

Research proposal to the faculty of Health Sciences

A requirement for the degree of Master in Family Medicine

Johannesburg, 2016

1070

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1. Introduction

Women's sexual health is influenced by many factors during their middle age. Although change in the levels of sexual hormones is the most prominent contributor in the development of the sexual dysfunction during this life stage, other contributing factors may play a role towards its development. Amongst these are: age, menopausal, Body Mass Index (BMI), communicable and non- communicable chronic disease as well as their medications.[1]

Globally studies have shown that female sexual life does not stop with menopause. Although the latter impacts negatively on certain aspects of the female sexual functioning, women at this period still consider sex as important this life period.[2 3 4]

Sexual dysfunction has recently been defined, following the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-V) as a recurrent or persistent sexual problems with desire, arousal, orgasm and/or pain that causes distress to the patient or her relationship.[5] Hence, the diagnosis of sexual dysfunction requires both clinical symptoms and associated distress.[5]

The last two decades, female sexual functioning, as a vital component of middle aged women's lives, has received an increasing attention in the literature.[6]

The researcher's encounters with these patients in daily practice have revealed, that primarily, most women have never been counselled on menopause, its effect on the female reproductive system and sexuality. Secondly, Primary Health Care (PHC) providers are not well equipped to monitor and manage women's sexual life through the menopausal transition and beyond. Thirdly, most of female middle aged patient experienced tension in their relationship because they could not cope sexually as they had before. Fourthly, there is scant literature in Africa in general, particularly in South Africa, about factors related to middle aged women and sexuality in our environment.

These observations motivated the researcher to determine the sexual function of women between the ages of 40-65 and ascertain the factors associated to their sexual dysfunction in Maquassi-Hills community.

The outcome of this study can be useful in implementing a primary healthcare based awareness programme that will promote an easy transition from reproductive to non-reproductive stages, an understanding of sexual function changes from the menopause transition and beyond, a minimisation of sexual distress and relationship tensions with an expectation of great benefit for chronic disease control.

2. Literature review

More women are living longer. The South African Medical Research Council (SAMRC) reported that female life expectancy at birth in South Africa increased to 65.1 in 2013. [7] Studies around the world showed that almost 40 percent of women present sexual complains and 20% among them with subjective distress. It has been found that women aged 45 -64 years present sexual dysfunction associated distress in USA.[8 9] Similar proportion was found by Laumann et at in their study including women from 40 to 80 years of age.[10] Thus understanding midlife female sexual function and dysfunction as well as factors affecting the quality of life become crucial for the primary health care providers. Several factors such as age, increased Body Mass Index, co- morbidity, level of education, low socio-economic status have been shown to influence sexuality during female mid-life.[8 9 11]

Age

To date there is still controversy in the literature about the effect of age on the female sexual function. [8 12 13] Some studies found that female sexual function starts declining from the late twenties and early thirties and the decline remains fairly constant as the woman grows older.[12 14 15 16] Bancroft et al. support the view that female sexual problems and associated personal distress increases as the age advance.[12] This was corroborated by Fugl- Meyer et al. who found that sexual desire and interest decreased as the age increased.[17]

In contrast, Bretschneider and Mccoy found that the prevalence of sexual problems tended to decrease at 80- 102 of age.[18] Dyspareunia was found to decrease as the age increased.[2]

Nevertheless, other studies found no associated between age and lack of libido and orgasm.[19] [20]

Menopause

Conflicting findings exist from the literature as regard the association of the menopausal status and the female sexual dysfunction. Dennersteirn et al. found a significant decline in sexual function throughout the menopausal transition. The female sexual function score has been found to fall dramatically during perimenopause compared to post menopause. Whereas significant decrease in libido ($p < 0.01$) and increase in dyspareunia ($p < 0,01$) were found post menopause.[21] In contrast, other studies support the view that female sexual function changes that are observed during midlife are associated to the woman previous and current health status, social status and former sexual activity than menopause itself. [22 23]

BMI

Scientific evidence has shown that BMI affects female sexual function.

Pontiroli et al. demonstrated that increased BMI was associated with a low Female Sexual Function Index.[24] This finding was corroborated by Pace et al. who found that a BMI of more than 30 in the early menopause was associated with an increase risk female sexual dysfunction, with an odds ratio of 1.22 for overweight versus 1.56 for obese women.[25]

Many studies on obesity and sexual function came to the same conclusion, namely that an increased BMI impairs female sexual function.[26 27 28 29 30] However, some doubt has been raised by Kadioglu et al. regarding obesity as factors of female sexual dysfunction.[31]

HIV

HIV infection has been found to influence negatively female sexual function.

Wilson et al. demonstrated that Female Sexual Function Index (FSFI) mean scores in HIV positive women (Mean = 13.8, SD = 12.7) were lower compare to those HIV negative (Mean = 18.0, SD = 13.2), indicating that HIV positive women had more sexual dysfunction.[32] In addition, among HIV infected female, women with CD4 less than 200 had lower FSFI scores compared to those with CD4 of more than 200. [34]

Diabetes

Studies have shown that diabetes affect negatively female sexual function but they gave inconsistent outcomes regarding the domain affected.[11 33] A recent systematic review

showed, although the mechanism remains unclear, that female diabetic patients irrespective of the diabetes type 1 or 2, presented more sexual dysfunction compare to controls.[16] A similar observation was made by Shi et al. who found that type 2 diabetic Chinese women presented a low FSFI and high female sexual dysfunction compare to non-diabetic. With orgasm being the main sexual problem although other sexual domains were also affected.[34] In addition, the regression study showed that age (regression coefficient 1,135 with P=0.000) and diabetes (3.480 with P=0.002) regression coefficient did not show any relationship as risk factors, while Body Mass index (regression coefficient 0.842 with P=0.031) particularly for obesity and diabetes showed interdependence as risk factor for the female sexual dysfunction.

Erol et al came to the same conclusion that type 2 diabetic women had lower FSFI and high female sexual dysfunction in all the domain; but the most frequent sexual problem accounted was the lack of libido.[35]

Hypertension

To date, the influence of hypertension or medication to treat hypertension on the menopausal sexual dysfunction remains controversial. Several studies found that hypertensive women reported more sexual dysfunction compare to women without hypertension.[36, 37, 38] None of these studies found a significant difference in term of sexual dysfunction between hypertensive women not on treatment compare to those on treatment.

Addis et al. did not find any association between anti-hypertensive treatment and sexual problem in post-menopausal patients.[39]

In contrast, some studies found that post-menopausal women treated with beta blocker to lower the blood pressure presented more sexual dysfunction compared with those treated with other hypertensive agents.[40]

Research question

What are the factors that are highly associated with sexual dysfunction in middle aged women (40-65) attending Segametsi and Tswelelang 2 clinics in Dr Kenneth Kaunda?

3. AIMS AND OBJECTIVES

3.1. Aim: To measure sexual function among women between 40- 65 years and explore factors that are associated with sexual dysfunction

3.2. Objectives

- To describe socio-demographic status of participants
- To describe co-morbidity of participants
- To determine sexual function index (FSFI) of participants
- To determine factors (socio-demographic and co-morbidities) which are significantly associated with sexual function among participants

4. Methods

4.1. Study design: cross sectional study

4.2. Study site

The study will take place at Maquassi-Hills sub-district, which is one of the four district municipalities of Dr Kenneth Kaunda district in the North West Province in South Africa. The sub-district covers a land area of approximately 4643 Km^2 with an estimated mixed population of 77,794 the majority of whom are blacks comprising 88.7% the rest of the population is a mixture of white (8.2%), coloured (2.3%) and Asian (0,8%). [41] The population is mainly rural and has an unemployment rate of 33.4% [41]

The most commonly spoken languages are Setswana (71.7%), Afrikaans (10.6%), Sesotho (6.6%). Only 1.8% peak English as their first language.

The sub-district has six Primary Health Care (PHC) facilities, two community health care centres (CHCs) and one district hospital. The researcher works at Tswelelang CHC and Segamtsi PHC. These will the study sites. The two studies sites are situated in black township area and most of the patients attending these facilities are blacks.

4.3. Study population

All women aged 40 to 65 years attending the selected clinics for various reasons.

4.4. Sampling and sample size

The sample size will be determined using Rao soft online sample size calculator.[42] Based on the updated data from the sub-district at the end of February 2016, a total of 3135 female patients aged from 40 to 65 years of age were examined over 12 months at the two selected

facilities, with 1983 patients for Tswelelang 2 CHC and 1152 for Segametsi clinic with an average of 523 over two months (330 and 192 respectively).

The minimum calculated sample size according to Raosoft (using 5% Margin of error, 95% confidence interval with a response distribution of 50%) is estimated at 222. In order to increase the power to detect differences between the two groups, sexual dysfunction and those with good function, the sample size will be increased to 333. Proportional sampling will be used to determine the number of women that will be studied in each clinic. The researcher will expect to get the following number of participants: 210 from Tswelelang 2 CHC and 123 from Segametsi clinic.

4.4.1. Inclusion and exclusion criteria:

4.4.1.1. Inclusion criteria:

- Women aged 40 to 65 years
- With the capacity to give informed consent
- having a partner

4.4.1.2. Exclusion criteria:

- Very ill patients needing immediate care

4.5. Selection and recruitment of subjects:

A non- random method will be used to select participants. All women aged 40 to 65 attending the clinic each day for any reason will be invited to participate in the study. As the women collect their files from the administrative clerk, potential participants will be referred to the doctor/professional nurse who will check the inclusion and exclusion criteria. Those satisfying to the criteria will be asked to sign an informed consent form after the study has been explained to them in the language of their choice. Those who agree will be enrolled to the study.

Those who decline to participate will be assured that there will be no discrimination against them and their reason for attending the clinic will be given attention as for agreeing patients. Those who do not fulfil the criteria will be seen in the usual way by the doctor/sister. Those who will be found to have sexual problem after questionnaire administration and willing to get help will be referred appropriately for further management.

4.6. Measuring tool:

The measuring tool will consist of two parts. The first part will contain social demographic and health information. The second part will deal with sexual function level using two standardised tool namely: The **Female Sexual Function Index-19** (FSFI-19) questionnaire (annexe: 2.3) which is a more sensitive test and specific test in detecting sexual dysfunction status. Which is a more sensitive test and specific test in detecting female sexual dysfunction status. This contains 19 questions for six domains of female sexual function. Each domain has a particular number of items and a given particular factor. The total score varies from 2.0 to 35.0, calculated according to domain score (Annexure 2.4) and a score of ≤ 26.55 will be interpreted as Female Sexual dysfunction (FSD) while the score of above 26.55 is considered as female good sexual function. The individual domains in the tool have a high test-retest reliability coefficients Pearson range: r of 0.79 to 0.86 with Cronbach Alpha ≥ 0.82. [43]

4.7. Pilot study

A pilot study will be conducted out of six patients aged 40-65 years of age randomly chosen to test: the patients' flow, the study assistant manner of caring out the participants, the clarity of questionnaire, the timing of the administration of the questionnaire, the score calculations and the filling of data in the record sheets.

4.8. Study limitation

Time and resources constraint will not allow the inclusion of significant number of clinics and patients in the sub-district. The results may not be representative of all women between 40-65 years of age attending the clinics.

5. DATA COLLECTION, CAPTURE AND ANALYSIS

5.1. Data collection

Data collection will be done over two months. The researcher will work two days in Segametsi clinic and three days in Tswelelang 2 CHC. According to clinic statistics, between 2-4 patients will be eligible for the study each day and this will not have a marked effect on waiting time for patient care.

Data will be collected by two trained, mature female assistants to improve response rate. There will be two assistants, one for each site. Enrolled participants will be referred to the trained matured female assistant to administer the study questionnaires once the former have been examined by the doctor/sister for their presenting problem. This will be done in a

private consulting room. The trained mature sister will sign an engagement paper to keep confidential the information they will have access to during the administration of the questionnaires.

The assistants will be trained on the main concept of the study, on how to approach participants, complete the questionnaires and score patients using FSFI-19. They will be instructed on how to administer the FSFI-19 first and calculate the total scores. After the interview, all questionnaires will be collected by the researcher and stored in a safe place. This will be done on a daily basis until the sample size required is obtained.

5.2. Data Capture and analysis

5.2.1 **Data capture**

Data capture and cleaning will be done using EXCEL software by the researcher and information kept confidential.

5.2.2. Data analysis

Data analysis will be done with the help of a statistician using STATA 9 software. Mean age and standard deviation of the patients will be calculated. All the observed factors influencing sexual function will be presented in the frequency table and Chi square will be used to test for association between factors and the level of sexual functions.

Logistic regression will be used to determine which factors are predictors of sexual dysfunction and sexual function.

Table 1. statistical test table

Objectives	**Data tools/Variables**	**Outcomes measures**
To describe the sociodemographic status of participants	1. Categorical variable: sex, level of education, marital status, employment status 2. Continuous variables: Age, BMI.	1. Frequencies and percentages **2.** Range, mean and standard deviation

To describe co-morbidity of participants	1. Clinical problems: HIV, diabetes, hypertension,	1. Frequencies and percentages
To determine sexual function index (FSFI) of participants	1. FSFI-19	1. Frequencies and percentages group of participants with sexual dysfunction and good sexual function 2. Frequencies and percentages of both group of participants with sexual dysfunction that causes distress and not
To determine factors (sociodemographic and co-morbidities) which are significantly associated with sexual function among participants	1. Chi- square 2. Logistic regression	Factors that are highly associated with sexual function among women aged 40-65 years

6. Source of Bias

Using two assistants at two different sites may introduce bias in the manner in which the two ask questions. This point will be emphasized during the training to minimise the bias.

7. Ethical consideration

Before starting the study, ethical clearance will be obtained from the Human Research Ethic Committee (HREC), University of the Witwatersrand. Johannesburg. Permission will also be sought form the provincial and district research committee and facility managers.

The study does not pose any risk or injury to the participants as no invasive procedures will be performed. However, the topic is highly sensitive and personal/private. Therefore, two mature, female assistants will be recruited and trained on how to approach participants, to administer questionnaire and do the scoring. They will sign a confidentiality agreement regarding the individual information that they will have access to during their face to face encounter with participants to avoid social stigmatisation. Questionnaires will be anonymous

and information obtained from the participants will be kept confidential. No name or file number wil be put on the questionnaire. They will be serially numbered and only the researchers will be able to identify the participants when verifying information. Written informed consent will be obtained from the participants (annexure 1). Participants with sexual problems and needing help will be referred to the doctor for the appropriate further management.

8. PROJECT MANAGEMENT

8.1. Time schedule

	May- July 2016	Aug-Nov 2016	Dec-Feb 2016	Mar-Jun 2017	July- Aug 2017
Protocol assessment					
Ethic application and clearance					
Collecting data					
Data analysis					
Writing up thesis					
Submission					

8.2. Funding

Item	**Cost in Rand (R)**
1. Stationary (paper, printer ink)	1,500
2. Language editing	2000
3. Other (gift. Cold drink, lunch, etc	5000
4. Statistician	1000
5. Transport to clinic and other	4000
Total	**13000**

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Appendix 1

INFORMATION SHEET AND CONSENT FORM

Study title: Sexual function among middle-aged women at two Primary Health Care facilities in Dr Kenneth Kaunda, South Africa

Dear Madam

Introduction:

My name is sister XXX, I am an Assistant/Professional nurse helping Doctor Moto Ahemeke Guyguy Mbonda for data/information collection and completion of the questionnaire regarding his research. It concerns female sexual experience in women at your age who are attending this clinic. The topic is highly sensitive and private, that he asked me to help for the interview and data/information collection.

The purpose of this research report is to determine which factors of women's life at your age are significantly associated with sexual problems/difficulties.

Invitation to participate:

You are invited to participate in this research study because you are aged between 40 and 65 years and attending a public primary health care facility.

What is involved in the study?

Your participation will consist of answering a once-off questionnaire of about 30- 50 minutes, on your socio-demographic profile and sexual life experience. If you agree to participate then I have to complete the questionnaire together with you to ascertain how good your sexual life experience is. Should it happen that we discover difficulties preventing you from enjoying full sexual life, we have then to help you if you desire so.

Risks and benefits related to participation: There is no expected direct physical, psychological and/or social risks or benefits during participation to the study.

Participation is voluntary. If for any reason, you do not wish to participate in this study or if at any stage you decide to withdraw from the questionnaire, you are free to do so since this is your right and I guarantee you that it will not affect your care as a patient. If you decide to withdraw, you may do so without providing any reason.

Reimbursements for “out of pocket” expenses. No reimbursement is expected from this study as it involves the administration of a once off questionnaire to a participant during her regular visit to the clinic.

Confidentiality: The nature of the questions are sensitive and private as they relate to your personal life. Efforts will be made to keep personal information confidential. No name or identifiers to disclose the participants’ identities to a third party will be used. Questionnaire will be given a serial number/code and the completed ones will be kept in the lockable drawer in the operational manager’s office. Its keys will be kept by the principal researcher and his assistant at each clinic. Raw data without participant names will be captured by the principal investigator in a protected Excel sheet for analysis and interpretation. The researcher assistant will sign a confidentiality agreement with principal researcher to keep secret the participant information. However, for quality assurance purpose, the researcher supervisor or institutions such as Human Research Ethics Committee (HREC) and university of Witwatersrand may have access to the raw data.

The outcome of this study will be published as the sub district situation and not as individual participant information.

Contact details of principal researcher and principal researcher’s supervisor – for further information / reporting of study related preoccupation, feel free to contact from 08:00 to 16:00, Monday to Friday:

- Dr Mbonda (Principal researcher) on 072 735 11 72 or ggmbonda@gmail.com
- Deidre Pretorius (Principal researcher’s supervisor) on 0825553597 or DeidrePretorius@wits.ac.za

Contact details of HREC administrator and chair – for reporting of complaints / problems related to ethic.

- Professor P. Cleaton-Jones (Chairman) on 011 717 2301 or Peter.Cleaton-Jones1@wits.ac.za
- Mr Rhulani Mkasi (Administrative Officer) on 011 717 1234 or rhulani.mkansi@wits.ac.za

Consent form to participate in the research

Sexual function among middle aged women at two Primary Health Care facilities in Dr Kenneth Kaunda, South Africa

If you choose to participate. please sign below and a copy of this consent form will be given to you for your own record purposes

---

A Consent Given

I, _____ the undersigned have hereby chosen to participate in the research study entitled, **Sexual function among middle-aged women at two Primary Health Care facilities in Dr Kenneth Kaunda, South Africa**

I understand that I have the right to withdraw myself from this research at any time. after notifying verbally Dr MBONDA without providing a reason.

I am participating in the study provided that my privacy and the information that I have given to the research team (Principal researcher and research assistant) will be kept confidential.

PATIENT: _____ DATE: _____

B Consent Not Given

I, _____ do not give consent:

PATIENT: _____ DATE: _____

Appendix 2: Questionnaire

Date:

Clinic:

Patient code: **Final score:**

Instruction to be read to the patient:

The questions I am going to ask you are about your sexual feelings and responses during the past four weeks to enable the researcher to find which aspect in the lives of women at your age are associated with good sexual experience and what is considered to be stressful in bad sexual experiences.

At Segametsi clinic and Tswelelang 2 Community Health Care. Thus I am expecting you to answer as clearly as and honestly as possible.

9.2.1. Socio-demographic and health status

Serial number: ☐ **Age (years): ……..**

Menopause status, are your menstruations: ☐

Regular ☐ **Irregular or stopped ≥3 months but < 12/12** ☐ **Post (no menses ≥ 12/12)** ☐

Marital status: Married ☐ **Stable relationship** ☐ **Having a partner** ☐

Education level: Primary ☐ **Secondary** ☐ **Tertiary** ☐

Employment status: Employed ☐ **Unemployed** ☐

Weight: …… (Kg) **Height: …….. m** **BMI (kg/m^2): ……**

Ethnicity: Black African ☐ **coloured** ☐ **white** ☐ **Indian** ☐ **other ……**

Co-morbidity: Hypertension ☐ **Diabetes** ☐ **HIV** ☐ **Other (s)……**

9.2.2. Female sexual function index- 19 (FSFI- 19)

Domaine 1

Desire/interest: feeling of willing to have sexual experience, thinking or fantasizing about having sex or feeling receptive to a partner's sexual initiation

3. How often did you feel sexual interest/desire over the past 4 weeks?

☐ 5 = Almost always or always

☐ 4 = Most times (more than half the time)

☐ 3 = Sometimes (about half the time)

☐ 2 = A few times (less than half the time)

☐ 1 = Almost never or never

4. How would you rate your degree/level of sexual desire/interest over the last four weeks?

☐ 5 = Very high

☐ 4 = High

☐ 3 = Moderate

☐ 2 = Low

☐ 1 = Very low or none at all

Domain 2

Sexual arousal is a feeling that includes both physical and mental aspects of sexual excitement. It May include feelings of warmth or tingling in the genitals, lubrication (wetness), or muscle contractions.

3. Over the past 4 weeks, how often did you feel sexually aroused ("turned on") during sexual activity or intercourse?

☐ 5 = Almost always or always

☐ 4 = Most times (more than half the time)

☐ 3 = Sometimes (about half the time)

☐ 2 = A few times (less than half the time)

☐ 1 = Almost never or never

☐ 0 = No sexual activity

4. Over the past 4 weeks, how would you rate your level of sexual arousal ("turn on") during sexual activity or intercourse?

☐ 5 = Very high

☐ 4 = High

☐ 3 = Moderate

☐ 2 = Low

☐ 1 = Very low or none at all

☐ 0 = No sexual activity

5. Over the past 4 weeks, how confident were you about becoming sexually aroused during sexual activity or intercourse?

☐ 5 = Very high confidence

☐ 4 = High confidence

☐ 3 = Moderate confidence

☐ 2 = Low confidence

☐ 1 = Very low or no confidence

☐ 0 = No sexual activity

6. Over the past 4 weeks, how often have you been satisfied with your arousal (excitement) during sexual activity or intercourse?

☐ 5 = Almost always or always

☐ 4 = Most times (more than half the time)

☐ 3 = Sometimes (about half the time)

☐ 2 = A few times (less than half the time)

A☐ 1 = Almost never or never

☐ 0 = No sexual activity

Domaine 3: Lubrication

7. Over the past 4 weeks, how often did you become lubricated (“wet”) during sexual activity or intercourse?

☐ 5 = Almost always or always

☐ 4 = Most times (more than half the time)

☐ 3 = Sometimes (about half the time)

☐ 2 = A few times (less than half the time)

☐ 1 = Almost never or never

☐ 0 = No sexual activity

8. Over the past 4 weeks, how difficult was it to become lubricated ("wet") during sexual activity or intercourse?

☐ 5 = Not difficult

☐ 4 = Slightly difficult

☐ 3 = Difficult ☐ 2 = Very difficult ☐ 1 = Extremely difficult or impossible

☐ 0 = No sexual activity

9. Over the past 4 weeks, how often did you maintain your lubrication ("wetness") until completion of sexual activity or intercourse?

☐ 5 = Almost always or always

☐ 4 = Most times (more than half the time)

☐ 3 = Sometimes (about half the time)

☐ 2 = A few times (less than half the time)

☐ 1 = Almost never or never

☐ 0 = No sexual activity

10. Over the past 4 weeks, how difficult was it to maintain your lubrication ("wetness") until completion of sexual activity or intercourse?

☐ 5 = Not difficult

☐ 4 = Slightly difficult

☐ 3 = Difficult

☐ 2 = Very difficult

☐ 1 = Extremely difficult or impossible

☐ 0 = No sexual activity

Domaine 4: Orgasm

11. Over the past 4 weeks, when you had sexual stimulation or intercourse, how often did you reach orgasm (climax)?

☐ 5 = Almost always or always

☐ 4 = Most times (more than half the time)

☐ 3 = Sometimes (about half the time)

☐ 2 = A few times (less than half the time)

☐ 1 = Almost never or never

☐ 0 = No sexual activity

12. Over the past 4 weeks, when you had sexual stimulation or intercourse, how difficult was it for you to reach orgasm (climax)?

☐ 5 = Not difficult

☐ 4 = Slightly difficult

☐ 3 = Difficult

☐ 2 = Very difficult

☐ 1 = Extremely difficult or impossible

☐ 0 = No sexual activity

13. Over the past 4 weeks, how satisfied were you with your ability to reach orgasm (climax) during sexual activity or intercourse?

☐ 5 = Very satisfied

☐ 4 = Moderately satisfied

☐ 3 = About equally satisfied and dissatisfied

☐ 2 = Moderately dissatisfied

☐ 1 = Very dissatisfied

☐ 0 = No sexual activity

Domaine 5: Satisfaction

14. Over the past 4 weeks, how satisfied have you been with the amount of emotional closeness during sexual activity between you and your partner?

☐ 5 = Very satisfied

☐ 4 = Moderately satisfied

☐ 3 = About equally satisfied and dissatisfied

☐ 2 = Moderately dissatisfied

☐ 1 = Very dissatisfied

☐ 0 = No sexual activity

15. Over the past 4 weeks, how satisfied have you been with your sexual relationship with your partner?

☐ 5 = Very satisfied

☐ 4 = Moderately satisfied

☐ 3 = About equally satisfied and dissatisfied

☐ 2 = Moderately dissatisfied

☐ 1 = Very dissatisfied

16. Over the past 4 weeks, how satisfied have you been with your overall sexual life?

☐ 5 = Very satisfied

☐ 4 = Moderately satisfied

☐ 3 = About equally satisfied and dissatisfied

☐ 2 = Moderately dissatisfied

☐ 1 = Very dissatisfied

Domaine 6: Pain

17. Over the past 4 weeks, how often did you experience discomfort or pain during vaginal penetration?

☐ 5 = Almost never or never

☐ 4 = A few times (less than half the time) ☐

3 = Sometimes (about half the time) ☐ 2 = Most times (more than half the time)

☐ 1 = Almost always or always

☐ 0 = Did not attempt intercourse

18. Over the past 4 weeks, how often did you experience discomfort or pain following vaginal penetration?

☐ 5 = Almost never or never

☐ 4 = A few times (less than half the time)

☐ 3 = Sometimes (about half the time)

☐ 2 = Most times (more than half the time) ☐ 1 = Almost always or always ☐ 0 = Did not attempt intercourse

19. Over the past 4 weeks, how would you rate your level (degree) of discomfort or pain during or following vaginal penetration?

☐ 5 = Very low or none at all

☐ 4 = Low

☐ 3 = Moderate

☐ 2 = High

☐ 1 = Very high

☐ 0 = Did not attempt intercourse

Thank you for your time

FSFI domain scoring and full scale score (Annexure 2.4)

Domain	Item number	Score Range	Factor	Minimum Score	Maximum score
Desire	**1,2**	**1- 2**	**0.6**	**1.2**	**6.0**

Arousal	**3,4,5,6**	**0- 5**	**0.3**	**0**	**6.0**
Lubrication	**7,8,9,10**	**0- 5**	**0.3**	**0**	**6.0**
Orgasm	**11,12,13**	**0- 5**	**0.4**	**0**	**6.0**
Satisfaction	**14,15,16**	**0(or 1)- 5***	**0.4**	**0.8**	**6.0**
Pain	**17,18,19**	**0- 5**	**0.4**	**0**	**6.0**
				2.0	**36.0**
Item 14 ranges from 0- 5 while items 15 and 16 range from 1-5					

A score of ≤ 26.55 classifies the woman as FSD while a score of > 26.55 classifies a sexually functional

Appendix 3: Term definition

In this research the following terms refer to the following meaning

9.3.1 Natural menopause is the permanent cessation of menstrual periods, determined retrospectively after a woman has experienced 12 months of amenorrhea without any other obvious pathological or physiological cause. It is a reflection of complete, or nearly complete, ovarian follicular depletion, which result in hypoestrogenemia and increase blood concentration of follicle- stimulating hormone.[44 45]

9.3.2 Menopausal status

Pre menopause: period in which the middle- aged women still have regular menstruation.[49]

Perimenopause**:** period in which the middle- aged women have menstruation irregularities and change in the usual bleeding pattern. (menopausal transition)[46]

Post-menopause: period in which the middle-aged women have no more menstruation for a period of at least 12 months.[47]

9.3.3 Sexual function: defined as the way the body reacts/responds to different stages of the sexual response cycle which includes sexual desire/libido, arousal, lubrication, orgasm, and resolution.[45]

Desire/libido: feeling of having sexual activity; it includes sexual thought, images or wishes. [45]

Arousal/excitement: feeling of sexual pleasure accompanied by physiological changes such as: Vasocongestion and increase in respiratory rate, blood pressure as well as heart rate.[45]

Orgasm: is the peak of sexual pleasure which is accompanied with accompanied with the release of sexual tension, rhythmic contraction of the sense of general well- being and perianal muscles. [45]

Resolution/satisfaction: it is the sense of general well-being and muscle relaxation following sexual actictivity.[45]

Pain: it is the experience of discomfort or pain during vaginal penetration. [45]

9.3.4. Sexual dysfunction is a recurrent or persistent problem/difficulty affecting one or more stage(s) of the women sexual response cycle that results in causing distress or affects negatively the relationship with the partner.[5]

Appendix VIII: Application for title change

UNIVERSITY OF THE WITWATERSRAND, JOHANNESBURG

FACULTY OF HEALTH SCIENCES

APPLICATION FOR CHANGE OF TITLE OF APPROVED RESEARCH REPORT, DISSERTATION OR THESIS

Student Surname and Initials: MBONDA M.A.G. Student Number: 782456

Degree: MMed Department: Family Medicine

Telephone: 072 735 11 72 mail:ggmbonda@gmail.com

Current Title: **Sexual function among middle-aged women at the two primary health care facilities in Dr Kenneth Kaunda, South Africa**

New Title: **Sexual function among middle-aged women attending primary health care facilities in Dr Kenneth Kaunda District, South Africa**

Motivation / Reason for title change: This change is commended by the Witwatersrand university research report reviewers

The examiner suggested it.

Approvals / signatures:

Student Signature: Date: 10 06 2021

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Supervisor 1 – Name & Surname: Deidre Peterson

Department: Family Medicine

Supervisor Telephone: 082 555 3597 Supervisor E-mail: deidre.peterson@wits.ac.za

Supervisor Signature: [signature] Date: 10 June 2024

HEAD OF DEPARTMENT / HEAD OF SCHOOL:** *(Where the HOD is Supervisor, the HOS must sign)***

Shabir Moosa (Name and Surname) | [signature] (Si | 2021.06.14 15:21:06 +02'00' | 14th June 2021 (Date)

POSTGRADUATE STAFF:

(Name and Surname) | (Signature) | (Date)

DECISION OF CHAIR OF THE PG AFFAIRS:

Comments:

Signature: Date:

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