

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

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18 (Family Medicine University of Witwatersrand)

19 Johannesburg 2020

20 **Declaration**

21

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

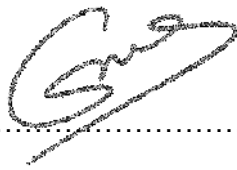
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34 (Signature of candidate)

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36 Date: 05 July 2021

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41 (Supervisor)

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43 Date: 05 July 2021

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52 Medicine, Witwatersrand University. To the Dr Kenneth Kaunda and the
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57 weekends, guiding my steps through the research process with dedication and
58 passion despite the hard times.

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71 Dedication

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

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93 List of tables

	Page
Table 1: Sociodemographic and clinical characteristics of participants	6
Table 2: Summary Female Sexual Function and Personal Sexual Distress	8
Table 3: Association between sociodemographic risk factors sexual functioning	9
Table 4: Association of anthropometric measures, sociodemographic and clinical factors with Low FSFI, PSD and FSD	10
Table 5: Logistic Regression: contribution of studied factors to low FSFI, PSD and FSD	11

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108 **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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122 Table of content

123

	Page
Declaration	ii
Acknowledgement	iii
Dedication	iv
List of tables	v
Nomenclature	vi
Table of contents	vii
Title	ix
Abstract	ix
Introduction	1
Methods	3
Study design and setting	3
Study population and sampling strategy	3
Data collection tool and method	4
Statistical Analysis	5
Ethical consideration	6
Results	6
Discussion	12
Study limitations	15
Conclusion	15
References	16
Article requirements	
Competing interests	26
Authors' contributions	26

Funding information	26
Data availability statement	26
Disclaimer	26
Appendices	27
Appendix I: Questionnaire	27
Appendix II: Information sheet and Consent form	34
Appendix III: Ethical clearance certificate	37
Appendix IV: Permissions	38
Appendix V: Turnitin	40
Appendix VI: Proofreading certificates 1 and 2	43
Appendix VII: Research Proposal	46
Appendix VIII: Application for title change	75

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

136

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

140 **Abstract**

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

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

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

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

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

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

157

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

162

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

164 Introduction

165

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

175

176 Chen et al.¹¹ referred to SD as difficulties that occur during the sexual response cycle that
177 prevent a person from experiencing satisfaction from sexual activity. This study favours the
178 diagnostic approach of Latif¹² and Bassan¹³, in which the diagnosis of sexual dysfunction
179 disorder (SDD) requires the presence of low Female Sexual Function Index (FSFI) score
180 secondary to a recurrent or persistent problem with sexual desire, sexual arousal, sexual
181 orgasm and/or pain associated with personal sexual distress (PSD) which may rise from the
182 patient and/or her intimate partner.

183

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

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

197

198 Data available on the prevalence of female sexual dysfunction (FSD) is highly variable. A
199 Brazilian cross-sectional study found a prevalence of SD of 67% among women aged from 40
200 to 65 years, using FSFI with globally accepted cut- off score of $\leq 26,55$.²² In parallel, a cohort
201 study in Chile, involving healthy women attending the Southern Metropolitan Health Service,
202 aged from 40 to 64, found a prevalence of SD in 51.3% of the 423/534 (79.2 %) sexually active
203 participants.²³ Furthermore, a multicentre Latin American study including healthy women
204 aged 40 to 59 found a SD prevalence varying from 21% to 98.5%.²⁴ While in Turkey, three
205 Family Health Centres estimated the prevalence of SD at 59.7 % for women between 35 and
206 65.²⁵

207

208 In a South African study in the rural Limpopo province, Ramakuela et al²⁶ found that 50% of
209 menopausal women experienced SD symptoms. This proportion increased with age and more
210 than 50% of the sample experienced changes in sexual desire and tended to avoid intercourse.
211 Ramakuela et al²⁷ also found in a qualitative study that menopausal women, besides
212 experiencing pain during intercourse due to vaginal atrophy and dryness, observed culture
213 and myths that made them avoid sexual intimacy, because they believed it was detrimental
214 and fatal to them as they have stopped menstruating. As a result, sexual intimacy was
215 considered wrong and/or forbidden.

216

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

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

226

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

232

233 **Methods**

234

235 **Study design and setting**

236

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

245

246 **Study population and sampling strategy**

247

248 A total of 3135 female patients aged 40 - 65 attended the two clinics over a twelve-month
249 period, according to the subdistrict's statistic as at 28 February 2016.³⁰ One thousand nine
250 hundred eighty-three patients attended Tsweleng 2 Community Health Centre (CHC) while
251 1152 attended Segametsi clinic with a proportion of 63% and 37% respectively. The sample
252 size was calculated as 222 women with 5% error margin, and a 95% confidence interval. The
253 sample was increased to 333 to improve the power to detect the difference between sexual
254 dysfunction and normal sexual function by 50%. Convenience sampling was used by including
255 clinics where the researcher served as doctor. His familiarity with the clinics' staff and
256 operational routine eased the research's process. The distribution of the sample was 210 for
257 the Tsweleng 2 CHC and 123 for the Segametsi Clinic based on a proportion of the average
258 number of patients frequenting these clinics.

259

260 **Data collection tool and method**

261

262 The research tool encompassed two parts. The first covered the sociodemographic and
263 clinical health variables based on the potential risk factors that affect middle-aged female
264 sexual function such as age, menstrual, marital and employment status, level of education
265 and body mass index (BMI). The latter was collected from the patient's files as well as
266 comorbidity such as hypertension (HTN), diabetes mellitus (DM) and HIV status which were
267 identified in research as factors influencing SD^{31,32} The second part dealt with the measuring
268 of the key components of female sexual function, using the Female Sexual Function Index- 19
269 (FSFI- 19) which is known to have an excellent internal reliability (Chronbach's Alpha > 0.9 for
270 all sub-scales) and a good test re-test reliability.³³ It contains 19 questions related to the six
271 domains of female sexual function (desire, arousal, lubrication, orgasm, satisfaction, and pain
272 during intercourse). A score of ≤ 26.55 was interpreted as low FSFI while the score above
273 26.55 was considered as high/normal FSFI.^{34,35} The globally used sexual dysfunction
274 assessment tool considered women with low FSFI score as having sexual dysfunction and
275 those having a combination of sexual dysfunction with sexual distress as having sexual
276 dysfunction disorder.³⁵

277

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

285

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

299

300 **Statistical Analysis**

301

302 Data collected from participants were captured on Microsoft Excel and the statistical analyses
303 were conducted with SPSS version 25. A Chi-square test, correlation and logistic regression
304 were used appropriately to measure association between variables. A *p*-value of less than
305 0.05 was statistically significant.

306

307 **Ethical consideration**

308

309 Ethical clearance was granted by the Human Research Ethic Committee (Medical) of the
310 university of the Witwatersrand, Johannesburg (M170201), on the 24 February 2017.

311 Permission was obtained from the subdistrict and District to conduct research at the two clinic
312 sites. Questionnaires were completed anonymously, and raw data were password protected

313

314 **Results**

315

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

323

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

327 **Table 1:** Sociodemographic and clinical characteristics of participants

Nr	Variable	Values
1	Ages (years)	
	Means \pm SD	50.55 \pm 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 \geq 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 \pm SD	29.99 \pm 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	
	χ²	P value	χ²	P value	χ²	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

362

363 The logistic regression analysis is presented in Table 5. Age, menopause status and
364 comorbidity (DM and HTN) significantly and positively contributed to low FSFI score. In other
365 words, for each year increased in the middle-age bracket, the odds of low FSFI increased by
366 approximately by 1,1 times. Being menopausal increased the odds of low FSFI by
367 approximately by 1.7 times. Moreover, having the comorbidities (DM and HTN) increased the
368 odds of having low FSFI by approximately 4.2 times. The level of education and employment
369 decreased the odds of having low FSFI, except for the primary level education. Having
370 secondary or tertiary level of education reduced the odds of low FSFI by approximately 75%
371 and almost 80% respectively. Being employed demonstrated a reduction of approximately
372 60% in the risk of low FSFI.

373

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

378

379 **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 menstruati on ≥ 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

380

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

383

384 Discussion

385

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

389

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

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

400

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

409

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

416

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

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

428

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

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

440

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

445

446 Cohen and Cohen⁶⁵ already suggested in 1985 that Family Physicians invite patients to discuss
447 their sexuality, provide information and discuss strategies to enhance intimacy. This is
448 however still a problem. Hence, this paper is again an opportunity for us to reiterate the call
449 to Family Physicians as members of the district clinical specialist team (DCST) and team
450 leaders for the PHC re-engineering process to fully play their role in meeting the unique needs
451 of individual middle-aged women regarding sexual function.^{66,67} They need to create
452 awareness in the health care system, the health district and province, stakeholders and to

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

459 **Study limitations**

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

466

467 **Conclusion**

468

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

478

479

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754 doi:10.1370/afm.1651

755

756 **Article requirements**

757 **Competing interests:** None to declare

758 **Authors' contributions:** M.A.G.M. conceived and presented the idea to E.W. and later to D.P.,
759 M.A.G.M. and E.W. developed the protocol. D.P. supervised data collection, computation,
760 analytical methods and the finding of the work. M.A.G.M. and P.D. discussed the results and
761 both contributed to the final manuscript.

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763 authorship and/or publication of this article.

764 **Data availability statement:** Data supporting the finding of this paper can be made available
765 to any demander upon a reasonable request.

766 **Disclaimer:** The views and opinions expressed in this article are those of the authors and do
767 not necessarily reflect the official policy or position of any affiliated agency of the authors

768 **Appendices**

769 **Appendix I: Questionnaire**

770

771 **Date:**

772 **Clinic:**

773 **Patient code:**

Final score:

774 **Instruction to be read to the patient:**

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

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

781 **9.2.1. Socio-demographic and health status**

782

783 **Serial number:**

Age (years):

784 **Menopause status, are your menstruations:**

785 **Regular** **Irregular or stopped ≥ 3 months but $< 12/12$** **Post (no menses \geq**
786 **12/12)**

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

788 **Education level: Primary** **Secondary** **Tertiary**

789 **Employment status: Employed** **Unemployed**

790 **Weight:** (Kg) **Height:** m **BMI (kg/m²):**

791

792 **Ethnicity:** Black African coloured white Indian other

793

794 **Co-morbidity:** Hypertension Diabetes HIV Other

795 **(s)**.....

796 **9.2.2. Female sexual function index- 19 (FSFI- 19)**

797 **Domaine 1**

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

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

801 5 = Almost always or always

802 4 = Most times (more than half the time)

803 3 = Sometimes (about half the time)

804 2 = A few times (less than half the time)

805 1 = Almost never or never

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

808 5 = Very high

809 4 = High

810 3 = Moderate

811 2 = Low

812 1 = Very low or none at all

813

814 **Domain 2**

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

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

820 5 = Almost always or always

821 4 = Most times (more than half the time)

822 3 = Sometimes (about half the time)

823 2 = A few times (less than half the time)

824 1 = Almost never or never

825 0 = No sexual activity

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

828 5 = Very high

829 4 = High

830 3 = Moderate

831 2 = Low

832 1 = Very low or none at all

833 0 = No sexual activity

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

836 5 = Very high confidence

837 4 = High confidence

838 3 = Moderate confidence

839 2 = Low confidence

840 1 = Very low or no confidence

841 0 = No sexual activity

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

- 844 5 = Almost always or always
- 845 4 = Most times (more than half the time)
- 846 3 = Sometimes (about half the time)
- 847 2 = A few times (less than half the time)
- 848 1 = Almost never or never
- 849 0 = No sexual activity

850 **Domaine 3: Lubrication**

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

- 853 5 = Almost always or always
- 854 4 = Most times (more than half the time)
- 855 3 = Sometimes (about half the time)
- 856 2 = A few times (less than half the time)
- 857 1 = Almost never or never
- 858 0 = No sexual activity

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

- 861 5 = Not difficult
- 862 4 = Slightly difficult
- 863 3 = Difficult 2
- 864 = Very difficult 1
- 865 = Extremely difficult or impossible
- 866 0 = No sexual activity

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

- 869 5 = Almost always or always
- 870 4 = Most times (more than half the time)

871 3 = Sometimes (about half the time)

872 2 = A few times (less than half the time)

873 1 = Almost never or never

874 0 = No sexual activity

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

877 5 = Not difficult

878 4 = Slightly difficult

879 3 = Difficult

880 2 = Very difficult

881 1 = Extremely difficult or impossible

882 0 = No sexual activity

883 **Domaine 4: Orgasm**

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

886 5 = Almost always or always

887 4 = Most times (more than half the time)

888 3 = Sometimes (about half the time)

889 2 = A few times (less than half the time)

890 1 = Almost never or never

891 0 = No sexual activity

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

894 5 = Not difficult

895 4 = Slightly difficult

896 3 = Difficult

897 2 = Very difficult

898 1 = Extremely difficult or impossible

899 0 = No sexual activity

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

902 5 = Very satisfied

903 4 = Moderately satisfied

904 3 = About equally satisfied and dissatisfied

905 2 = Moderately dissatisfied

906 1 = Very dissatisfied

907 0 = No sexual activity

908 **Domaine 5: Satisfaction**

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

911 5 = Very satisfied

912 4 = Moderately satisfied

913 3 = About equally satisfied and dissatisfied

914 2 = Moderately dissatisfied

915 1 = Very dissatisfied

916 0 = No sexual activity

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

919 5 = Very satisfied

920 4 = Moderately satisfied

921 3 = About equally satisfied and dissatisfied

922 2 = Moderately dissatisfied

923 1 = Very dissatisfied

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

- 925 5 = Very satisfied
- 926 4 = Moderately satisfied
- 927 3 = About equally satisfied and dissatisfied
- 928 2 = Moderately dissatisfied
- 929 1 = Very dissatisfied

930 **Domaine 6: Pain**

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

- 933 5 = Almost never or never
- 934 4 = A few times (less than half the time)
- 935 3 = Sometimes (about half the time) 2 =
- 936 Most times (more than half the time)
- 937 1 = Almost always or always
- 938 0 = Did not attempt intercourse

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

- 941 5 = Almost never or never
- 942 4 = A few times (less than half the time)
- 943 3 = Sometimes (about half the time)
- 944 2 = Most times (more than half the time)
- 945 1 = Almost always or always 0 = Did not attempt intercourse

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

- 948 5 = Very low or none at all
- 949 4 = Low
- 950 3 = Moderate
- 951 2 = High

952 1 = Very high

953 0 = Did not attempt intercourse

954 **Thank you for your time**

955

956 **FSFI domain scoring and full scale score (Annexure 2.4)**

				Minimum	Maximum
Domain	Item number	Score Range	Factor	Score	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

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

959

960 **Appendix II: INFORMATION SHEET AND CONSENT FORM**

961

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

964

965 Dear Madam

966

967 **Introduction:**

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

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

975

976 **Invitation to participate:**

977 You are invited to participate in this research study because you are aged between
978 40 and 65 years and attending a public primary health care facility.

979

980 **What is involved in the study?**

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

987

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

990

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

995

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

999

1000 **Confidentiality:** The nature of the questions are sensitive and private as they relate
1001 to your personal life. Efforts will be made to keep personal information confidential. No
1002 name or identifiers to disclose the participants' identities to a third party will be used.

1003 Questionnaire will be given a serial number/code and the completed ones will be kept
1004 in the lockable drawer in the operational manager's office. Its keys will be kept by the
1005 principal researcher and his assistant at each clinic. Raw data without participant
1006 names will be captured by the principal investigator in a protected Excel sheet for
1007 analysis and interpretation. The researcher assistant will sign a confidentiality
1008 agreement with principal researcher to keep secret the participant information.
1009 However, for quality assurance purpose, the researcher supervisor or institutions such
1010 as Human Research Ethics Committee (HREC) and university of Witwatersrand may
1011 have access to the raw data.

1012 The outcome of this study will be published as the sub district situation and not as
1013 individual participant information.

1014

1015 **Contact details of principal researcher and principal researcher's supervisor –**
1016 **for further information / reporting of study related preoccupation, feel free to contact**
1017 **from 08:00 to 16:00, Monday to Friday:**

- 1018 • Dr Mbonda (Principal researcher) on 072 735 11 72 or ggmbonda@gmail.com
- 1019 • Deidre Pretorius (Principal researcher's supervisor) on 0825553597 or
1020 DeidrePretorius@wits.ac.za

1021

1022 **Contact details of HREC administrator and chair – for reporting of complaints /**
1023 **problems related to ethic.**

- 1024 • Professor P. Cleaton-Jones (Chairman) on 011 717 2301 or [Peter.Cleaton-](mailto:Peter.Cleaton-Jones1@wits.ac.za)
1025 [Jones1@wits.ac.za](mailto:Peter.Cleaton-Jones1@wits.ac.za)
- 1026 • Mr Rhulani Mkasi (Administrative Officer) on 011 717 1234 or
1027 rhulani.mkansi@wits.ac.za

1028

1029

1030

1031

1032

1033

1034

1035

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: Dr Moto Ahemeke Guyguy Mbonda
(Principal Investigator)
DEPARTMENT: Family Medicine
Maquassi-Hills Sub-District, North West Province

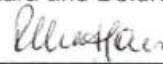
PROJECT TITLE: Sexual Function among Middle Aged Women at
Two Primary Health Care Facilities in Dr Kenneth
Kaunda, South Africa

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 reviewed 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

Enq: Nthabiseng Mapogo
Tel: 018 391 4504
NMapogo@nwppg.gov.za
www.nwhealth.gov.za



RESEARCH, MONITORING AND EVALUATION DIRECTORATE

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

Physical Address (Work/ Institution): 28th, Kruger street, Wolmaransstad.
National department of health; Manguassikhi
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

Dr. MASON DAT



Healthy Living for All



health

Department of
Health
North West Province
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Old Mutual Building
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Email: osesinyi@nwpg.gov.za
www.nwhealth.gov.za

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: gmbonda@gmail.com
Cell. 072 73 5 11 72

From: Ockie Sesinyi
Acting Deputy Director
Maquassi Hills Sub District

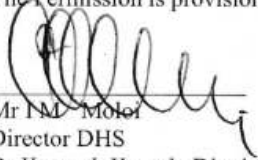
Re: REQUEST FOR APPROVAL TO CONDUCT RESEARCH STUDY.

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 granted 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 M M Molo
Director DHS
Dr Kenneth Kaunda District

11/11/2020
DATE

1042

1043 **Appendix V: Turn it in report**

782456:Mbonda_782456_turnitin .docx

by Moto Mbonda

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

Submission ID: 1454935071

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1046

1047 **Appendix VI: Proofreading certificates**

1048

1049

Proofreading certificate 1

1050

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

November 12th, 2020

8
9

ENGLISH PROOF-READING/EDITING

10
11

To Whom It May Concern

12
13
14
15
16
17
18
19

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.

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24

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.

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F.E. Meyer

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

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Footnote: Proof reader's/Editor's covering page		
<i>Edited journal article</i>	<i>2020/11/12</i>	<i>PRET/03</i>

1051



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 letter 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,

A handwritten signature in black ink, appearing to read 'R. Olinger', written over a light blue horizontal line.

Renate Olinger

Editor & Proofreader

1054 **Appendix VII: Research Proposal**

1055

1056 Sexual function among middle-aged women at two Primary Health Care facilities
1057 in Dr Kenneth Kaunda, South Africa

1058

1059 By Dr Moto Ahemeke Guyguy Mbonda

1060 Student number 782456

1061 Supervisor: Dr Edrone Rwakaikara

1062

1063

1064 Witwatersrand

1065 Research proposal to the faculty of Health Sciences

1066

1067

1068 A requirement for the degree of Master in Family Medicine

1069 Johannesburg, 2016

Table of content	Page
1 INTRODUCTION	39
2 LITERATURE	40
3 AIMS AND OBJECTIVES	44
4 METHODS	44
4.1 Study design	44
4.2 Study site	44
4.3 Study population	45
4.4 Sampling and sample size	45
4.5 Selection and recruitment of subjects	46
4.6 Measuring tool: Female Sexual Function Index- 19	46
4.7 Pilot study	47
4.8 Study limitation	47
5 DATA COLLECTION, CAPTURE AND ANALYSIS	47
6 SOURCE OF BIAS	50
7 ETHICAL CONSIDERATION	50
8 PROJECT MANAGEMENT	51
9 ADDENDUM	52
9.1 Appendix 1: consent form/Patient information sheet	52
9.2 Appendix 2: Questionnaires	54
9.2 Appendix 2: Questionnaires	63
9.3 Appendix 3: Term and definition	65
10 REFERENCES	65

1073 **1. Introduction**

1074

1075 Women's sexual health is influenced by many factors during their middle age. Although
1076 change in the levels of sexual hormones is the most prominent contributor in the
1077 development of the sexual dysfunction during this life stage, other contributing factors may
1078 play a role towards its development. Amongst these are: age, menopausal, Body Mass Index
1079 (BMI), communicable and non- communicable chronic disease as well as their medications.¹

1080 Globally studies have shown that female sexual life does not stop with menopause. Although
1081 the latter impacts negatively on certain aspects of the female sexual functioning, women at
1082 this period still consider sex as important this life period.^{2 3 4}

1083 Sexual dysfunction has recently been defined, following the Diagnostic and Statistical Manual
1084 of Mental Disorders, Fifth Edition (DSM-V) as a recurrent or persistent sexual problems with
1085 desire, arousal, orgasm and/or pain that causes distress to the patient or her relationship.⁵
1086 Hence, the diagnosis of sexual dysfunction requires both clinical symptoms and associated
1087 distress.⁵

1088 The last two decades, female sexual functioning, as a vital component of middle aged
1089 women's lives, has received an increasing attention in the literature.⁶

1090 The researcher's encounters with these patients in daily practice have revealed, that
1091 primarily, most women have never been counselled on menopause, its effect on the female
1092 reproductive system and sexuality. Secondly, Primary Health Care (PHC) providers are not
1093 well equipped to monitor and manage women's sexual life through the menopausal transition
1094 and beyond. Thirdly, most of female middle aged patient experienced tension in their
1095 relationship because they could not cope sexually as they had before. Fourthly, there is scant
1096 literature in Africa in general, particularly in South Africa, about factors related to middle aged
1097 women and sexuality in our environment.

1098 These observations motivated the researcher to determine the sexual function of women
1099 between the ages of 40-65 and ascertain the factors associated to their sexual dysfunction in
1100 Maquassi-Hills community.

1101 The outcome of this study can be useful in implementing a primary healthcare based
1102 awareness programme that will promote an easy transition from reproductive to non-
1103 reproductive stages, an understanding of sexual function changes from the menopause
1104 transition and beyond, a minimisation of sexual distress and relationship tensions with an
1105 expectation of great benefit for chronic disease control.

1106 **2. Literature review**

1107 More women are living longer. The South African Medical Research Council (SAMRC) reported
1108 that female life expectancy at birth in South Africa increased to 65.1 in 2013.⁷ Studies
1109 around the world showed that almost 40 percent of women present sexual complains and
1110 20% among them with subjective distress. It has been found that women aged 45 -64 years
1111 present sexual dysfunction associated distress in USA.^{8 9} Similar proportion was found by
1112 Laumann et al in their study including women from 40 to 80 years of age.¹⁰ Thus
1113 understanding midlife female sexual function and dysfunction as well as factors affecting the
1114 quality of life become crucial for the primary health care providers. Several factors such as
1115 age, increased Body Mass Index, co- morbidity, level of education, low socio-economic status
1116 have been shown to influence sexuality during female mid-life.^{8 9 11}

1117

1118 **Age**

1119 To date there is still controversy in the literature about the effect of age on the female sexual
1120 function.^{8 12 13} Some studies found that female sexual function starts declining from the late
1121 twenties and early thirties and the decline remains fairly constant as the woman grows
1122 older.^{12 14 15 16} Bancroft et al. support the view that female sexual problems and associated
1123 personal distress increases as the age advance.¹² This was corroborated by Fugl- Meyer et al.
1124 who found that sexual desire and interest decreased as the age increased.¹⁷

1125 In contrast, Bretschneider and McCoy found that the prevalence of sexual problems tended
1126 to decrease at 80- 102 of age.¹⁸ Dyspareunia was found to decrease as the age increased.²

1127 Nevertheless, other studies found no associated between age and lack of libido and orgasm.¹⁹

1128 ²⁰

1129 **Menopause**

1130 Conflicting findings exist from the literature as regard the association of the menopausal
1131 status and the female sexual dysfunction. Dennersteirn et al. found a significant decline in
1132 sexual function throughout the menopausal transition. The female sexual function score has
1133 been found to fall dramatically during perimenopause compared to post menopause.
1134 Whereas significant decrease in libido ($p < 0.01$) and increase in dyspareunia ($p < 0,01$) were
1135 found post menopause.²¹ In contrast, other studies support the view that female sexual
1136 function changes that are observed during midlife are associated to the woman previous and
1137 current health status, social status and former sexual activity than menopause itself.^{22 23}

1138

1139 **BMI**

1140 Scientific evidence has shown that BMI affects female sexual function.

1141 Pontiroli et al. demonstrated that increased BMI was associated with a low Female Sexual
1142 Function Index.²⁴ This finding was corroborated by Pace et al. who found that a BMI of more
1143 than 30 in the early menopause was associated with an increase risk female sexual
1144 dysfunction, with an odds ratio of 1.22 for overweight versus 1.56 for obese women.²⁵

1145 Many studies on obesity and sexual function came to the same conclusion, namely that an
1146 increased BMI impairs female sexual function.^{26 27 28 29 30} However, some doubt has been
1147 raised by Kadioglu et al. regarding obesity as factors of female sexual dysfunction.³¹

1148 **HIV**

1149 HIV infection has been found to influence negatively female sexual function.

1150 Wilson et al. demonstrated that Female Sexual Function Index (FSFI) mean scores in HIV
1151 positive women (Mean = 13.8, SD = 12.7) were lower compare to those HIV negative (Mean
1152 = 18.0, SD = 13.2), indicating that HIV positive women had more sexual dysfunction.³² In
1153 addition, among HIV infected female, women with CD4 less than 200 had lower FSFI scores
1154 compared to those with CD4 of more than 200.³⁴

1155 **Diabetes**

1156 Studies have shown that diabetes affect negatively female sexual function but they gave
1157 inconsistent outcomes regarding the domain affected.^{11 33} A recent systematic review

1158 showed, although the mechanism remains unclear, that female diabetic patients irrespective
1159 of the diabetes type 1 or 2, presented more sexual dysfunction compare to controls.¹⁶ A
1160 similar observation was made by Shi et al. who found that type 2 diabetic Chinese women
1161 presented a low FSFI and high female sexual dysfunction compare to non-diabetic. With
1162 orgasm being the main sexual problem although other sexual domains were also affected.³⁴
1163 In addition, the regression study showed that age (regression coefficient 1,135 with P=0.000)
1164 and diabetes (3.480 with P=0.002) regression coefficient did not show any relationship as risk
1165 factors, while Body Mass index (regression coefficient 0.842 with P=0.031) particularly for
1166 obesity and diabetes showed interdependence as risk factor for the female sexual
1167 dysfunction.

1168 Erol et al came to the same conclusion that type 2 diabetic women had lower FSFI and high
1169 female sexual dysfunction in all the domain; but the most frequent sexual problem accounted
1170 was the lack of libido.³⁵

1171 **Hypertension**

1172 To date, the influence of hypertension or medication to treat hypertension on the
1173 menopausal sexual dysfunction remains controversial. Several studies found that
1174 hypertensive women reported more sexual dysfunction compare to women without
1175 hypertension.^{36, 37, 38} None of these studies found a significant difference in term of sexual
1176 dysfunction between hypertensive women not on treatment compare to those on treatment.

1177 Addis et al. did not find any association between anti-hypertensive treatment and sexual
1178 problem in post-menopausal patients.³⁹

1179 In contrast, some studies found that post-menopausal women treated with beta blocker to
1180 lower the blood pressure presented more sexual dysfunction compared with those treated
1181 with other hypertensive agents.⁴⁰

1182

1183 **Research question**

1184 What are the factors that are highly associated with sexual dysfunction in middle aged women
1185 (40-65) attending Segametsi and Tsweleng 2 clinics in Dr Kenneth Kaunda?

1186 **3. AIMS AND OBJECTIVES**

1187 **3.1. Aim:** To measure sexual function among women between 40- 65 years and explore
1188 factors that are associated with sexual dysfunction

1189 **3.2. Objectives**

- 1190 - To describe socio-demographic status of participants
- 1191 - To describe co-morbidity of participants
- 1192 - To determine sexual function index (FSFI) of participants
- 1193 - To determine factors (socio-demographic and co-morbidities) which are significantly
1194 associated with sexual function among participants

1195 **4. Methods**

1196 **4.1. Study design:** cross sectional study

1197 **4.2. Study site**

1198 The study will take place at Maquassi-Hills sub-district, which is one of the four district
1199 municipalities of Dr Kenneth Kaunda district in the North West Province in South Africa. The
1200 sub-district covers a land area of approximately 4643 Km² with an estimated mixed
1201 population of 77,794 the majority of whom are blacks comprising 88.7% the rest of the
1202 population is a mixture of white (8.2%), coloured (2.3%) and Asian (0,8%).⁴¹ The population
1203 is mainly rural and has an unemployment rate of 33.4%⁴¹

1204 The most commonly spoken languages are Setswana (71.7%), Afrikaans (10.6%), Sesotho
1205 (6.6%). Only 1.8% speak English as their first language.

1206 The sub-district has six Primary Health Care (PHC) facilities, two community health care
1207 centres (CHCs) and one district hospital. The researcher works at Tsweleng CHC and
1208 Segamtsi PHC. These will be the study sites. The two study sites are situated in black township
1209 area and most of the patients attending these facilities are blacks.

1210 **4.3. Study population**

1211 All women aged 40 to 65 years attending the selected clinics for various reasons.

1212 **4.4. Sampling and sample size**

1213 The sample size will be determined using Rao's online sample size calculator.⁴² Based on
1214 the updated data from the sub-district at the end of February 2016, a total of 3135 female
1215 patients aged from 40 to 65 years of age were examined over 12 months at the two selected

1216 facilities, with 1983 patients for Tsweleng 2 CHC and 1152 for Segametsi clinic with an
1217 average of 523 over two months (330 and 192 respectively).

1218 The minimum calculated sample size according to Raosoft (using 5% Margin of error, 95%
1219 confidence interval with a response distribution of 50%) is estimated at 222. In order to
1220 increase the power to detect differences between the two groups, sexual dysfunction and
1221 those with good function, the sample size will be increased to 333. Proportional sampling will
1222 be used to determine the number of women that will be studied in each clinic. The researcher
1223 will expect to get the following number of participants: 210 from Tsweleng 2 CHC and 123
1224 from Segametsi clinic.

1225 **4.4.1. Inclusion and exclusion criteria:**

1226 **4.4.1.1. Inclusion criteria:**

- 1227 • Women aged 40 to 65 years
- 1228 • With the capacity to give informed consent
- 1229 • having a partner

1230 **4.4.1.2. Exclusion criteria:**

- 1231 • Very ill patients needing immediate care

1232 **4.5. Selection and recruitment of subjects:**

1233 A non- random method will be used to select participants. All women aged 40 to 65 attending
1234 the clinic each day for any reason will be invited to participate in the study. As the women
1235 collect their files from the administrative clerk, potential participants will be referred to the
1236 doctor/professional nurse who will check the inclusion and exclusion criteria. Those satisfying
1237 to the criteria will be asked to sign an informed consent form after the study has been
1238 explained to them in the language of their choice. Those who agree will be enrolled to the
1239 study.

1240 Those who decline to participate will be assured that there will be no discrimination against
1241 them and their reason for attending the clinic will be given attention as for agreeing patients.
1242 Those who do not fulfil the criteria will be seen in the usual way by the doctor/sister. Those
1243 who will be found to have sexual problem after questionnaire administration and willing to
1244 get help will be referred appropriately for further management.

1245 **4.6. Measuring tool:**

1246 The measuring tool will consist of two parts. The first part will contain social demographic and
1247 health information. The second part will deal with sexual function level using two
1248 standardised tool namely: The **Female Sexual Function Index-19** (FSFI-19) questionnaire
1249 (annexe: 2.3) which is a more sensitive test and specific test in detecting sexual dysfunction
1250 status. Which is a more sensitive test and specific test in detecting female sexual dysfunction
1251 status. This contains 19 questions for six domains of female sexual function. Each domain has
1252 a particular number of items and a given particular factor. The total score varies from 2.0 to
1253 35.0, calculated according to domain score (Annexure 2.4) and a score of ≤ 26.55 will be
1254 interpreted as Female Sexual dysfunction (FSD) while the score of above 26.55 is considered
1255 as female good sexual function. The individual domains in the tool have a high test-retest
1256 reliability coefficients Pearson range: r of 0.79 to 0.86 with Cronbach Alpha ≥ 0.82 .⁴³

1257 **4.7. Pilot study**

1258 A pilot study will be conducted out of six patients aged 40-65 years of age randomly chosen
1259 to test: the patients' flow, the study assistant manner of caring out the participants, the
1260 clarity of questionnaire, the timing of the administration of the questionnaire, the score
1261 calculations and the filling of data in the record sheets.

1262 **4.8. Study limitation**

1263 Time and resources constraint will not allow the inclusion of significant number of clinics
1264 and patients in the sub-district. The results may not be representative of all women
1265 between 40-65 years of age attending the clinics.

1266 **5. DATA COLLECTION, CAPTURE AND ANALYSIS**

1267 **5.1. Data collection**

1268 Data collection will be done over two months. The researcher will work two days in Segametsi
1269 clinic and three days in Tsweleng 2 CHC. According to clinic statistics, between 2-4 patients
1270 will be eligible for the study each day and this will not have a marked effect on waiting time
1271 for patient care.

1272 Data will be collected by two trained, mature female assistants to improve response rate.
1273 There will be two assistants, one for each site. Enrolled participants will be referred to the
1274 trained matured female assistant to administer the study questionnaires once the former
1275 have been examined by the doctor/sister for their presenting problem. This will be done in a

1276 private consulting room. The trained mature sister will sign an engagement paper to keep
 1277 confidential the information they will have access to during the administration of the
 1278 questionnaires.

1279 The assistants will be trained on the main concept of the study, on how to approach
 1280 participants, complete the questionnaires and score patients using FSFI-19. They will be
 1281 instructed on how to administer the FSFI-19 first and calculate the total scores. After the
 1282 interview, all questionnaires will be collected by the researcher and stored in a safe place.
 1283 This will be done on a daily basis until the sample size required is obtained.

1284 **5.2. Data Capture and analysis**

1285 **5.2.1 Data capture**

1286 Data capture and cleaning will be done using EXCEL software by the researcher and
 1287 information kept confidential.

1288 **5.2.2. Data analysis**

1289 Data analysis will be done with the help of a statistician using STATA 9 software. Mean age
 1290 and standard deviation of the patients will be calculated. All the observed factors influencing
 1291 sexual function will be presented in the frequency table and Chi square will be used to test
 1292 for association between factors and the level of sexual functions.

1293 Logistic regression will be used to determine which factors are predictors of sexual
 1294 dysfunction and sexual function.

1295

1296

1297 **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

1298

1299 **6. Source of Bias**

1300 Using two assistants at two different sites may introduce bias in the manner in which the two
1301 ask questions. This point will be emphasized during the training to minimise the bias.

1302 **7. Ethical consideration**

1303 Before starting the study, ethical clearance will be obtained from the Human Research Ethic
1304 Committee (HREC), University of the Witwatersrand. Johannesburg. Permission will also be
1305 sought form the provincial and district research committee and facility managers.

1306 The study does not pose any risk or injury to the participants as no invasive procedures will
1307 be performed. However, the topic is highly sensitive and personal/private. Therefore, two
1308 mature, female assistants will be recruited and trained on how to approach participants, to
1309 administer questionnaire and do the scoring. They will sign a confidentiality agreement
1310 regarding the individual information that they will have access to during their face to face
1311 encounter with participants to avoid social stigmatisation. Questionnaires will be anonymous

1312 and information obtained from the participants will be kept confidential. No name or file
 1313 number will be put on the questionnaire. They will be serially numbered and only the
 1314 researchers will be able to identify the participants when verifying information. Written
 1315 informed consent will be obtained from the participants (annexure 1). Participants with
 1316 sexual problems and needing help will be referred to the doctor for the appropriate further
 1317 management.

1318

1319 **8. PROJECT MANAGEMENT**

1320 **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					

1321

1322 **8.2. Funding**

Item	Cost in Rand (R)	
1. Stationary (paper, printer ink)	1,500	1324
2. Language editing	2000	1325
3. Other (gift. Cold drink, lunch, etc	5000	
4. Statistician	1000	1326
5. Transport to clinic and other	4000	1327
Total	13000	

1328

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1491

1492

1493 **INFORMATION SHEET AND CONSENT FORM**

1494

1495 **Study title:** Sexual function among middle-aged women at two Primary Health Care facilities
1496 in Dr Kenneth Kaunda, South Africa

1497

1498 Dear Madam

1499

1500 **Introduction:**

1501 My name is sister XXX, I am an Assistant/Professional nurse helping Doctor Moto
1502 Ahemeke Guyguy Mbonda for data/information collection and completion of the
1503 questionnaire regarding his research. It concerns female sexual experience in
1504 women at your age who are attending this clinic. The topic is highly sensitive and
1505 private, that he asked me to help for the interview and data/information collection.

1506 The purpose of this research report is to determine which factors of women's life at
1507 your age are significantly associated with sexual problems/difficulties.

1508

1509 **Invitation to participate:**

1510 You are invited to participate in this research study because you are aged between
1511 40 and 65 years and attending a public primary health care facility.

1512

1513 **What is involved in the study?**

1514 Your participation will consist of answering a once-off questionnaire of about 30- 50
1515 minutes, on your socio-demographic profile and sexual life experience. If you agree
1516 to participate then I have to complete the questionnaire together with you to
1517 ascertain how good your sexual life experience is. Should it happen that we discover
1518 difficulties preventing you from enjoying full sexual life, we have then to help you if
1519 you desire so.

1520

1521 **Risks and benefits related to participation:** There is no expected direct physical,
1522 psychological and/or social risks or benefits during participation to the study.

1523

1524 **Participation is voluntary.** If for any reason, you do not wish to participate in this
1525 study or if at any stage you decide to withdraw from the questionnaire, you are free
1526 to do so since this is your right and I guarantee you that it will not affect your care as
1527 a patient. If you decide to withdraw, you may do so without providing any reason.

1528

1529 **Reimbursements** for “out of pocket” expenses. No reimbursement is expected from
1530 this study as it involves the administration of a once off questionnaire to a participant
1531 during her regular visit to the clinic.

1532

1533 **Confidentiality:** The nature of the questions are sensitive and private as they relate
1534 to your personal life. Efforts will be made to keep personal information confidential. No
1535 name or identifiers to disclose the participants’ identities to a third party will be used.
1536 Questionnaire will be given a serial number/code and the completed ones will be kept
1537 in the lockable drawer in the operational manager’s office. Its keys will be kept by the
1538 principal researcher and his assistant at each clinic. Raw data without participant
1539 names will be captured by the principal investigator in a protected Excel sheet for
1540 analysis and interpretation. The researcher assistant will sign a confidentiality
1541 agreement with principal researcher to keep secret the participant information.
1542 However, for quality assurance purpose, the researcher supervisor or institutions such
1543 as Human Research Ethics Committee (HREC) and university of Witwatersrand may
1544 have access to the raw data.

1545 The outcome of this study will be published as the sub district situation and not as
1546 individual participant information.

1547

1548 **Contact details of principal researcher and principal researcher’s supervisor –**
1549 **for further information / reporting of study related preoccupation, feel free to contact**
1550 **from 08:00 to 16:00, Monday to Friday:**

- 1551 • Dr Mbonda (Principal researcher) on 072 735 11 72 or ggmbonda@gmail.com
- 1552 • Deidre Pretorius (Principal researcher’s supervisor) on 0825553597 or
1553 DeidrePretorius@wits.ac.za

1554

1555 **Contact details of HREC administrator and chair – for reporting of complaints /**
1556 **problems related to ethic.**

- 1557 • Professor P. Cleaton-Jones (Chairman) on 011 717 2301 or [Peter.Cleaton-](mailto:Peter.Cleaton-Jones1@wits.ac.za)
1558 Jones1@wits.ac.za
- 1559 • Mr Rhulani Mkasi (Administrative Officer) on 011 717 1234 or
1560 rhulani.mkansi@wits.ac.za

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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: _____

1569

1570

1571

1572

Appendix 2: Questionnaire

1573 **Date:**

1574 **Clinic:**

1575 **Patient code:**

Final score:

1576 **Instruction to be read to the patient:**

1577 The questions I am going to ask you are about your sexual feelings and responses during the
1578 past four weeks to enable the researcher to find which aspect in the lives of women at your
1579 age are associated with good sexual experience and what is considered to be stressful in bad
1580 sexual experiences.

1581 At Segametsi clinic and Tsweleng 2 Community Health Care. Thus I am expecting you to
1582 answer as clearly as and honestly as possible.

1583 **9.2.1. Socio-demographic and health status**

1584

1585 **Serial number:**

Age (years):

1586 **Menopause status, are your menstruations:**

1587 **Regular** **Irregular or stopped ≥ 3 months but $< 12/12$** **Post (no menses \geq**
1588 **12/12)**

1589 **Marital status: Married** **Stable relationship** **Having a partner**

1590 **Education level: Primary** **Secondary** **Tertiary**

1591 **Employment status: Employed** **Unemployed**

1592 **Weight:** (Kg) **Height:** m **BMI (kg/m²):**

1593

1594 **Ethnicity: Black African** **coloured** **white** **Indian** **other**

1595

1596 **Co-morbidity: Hypertension** **Diabetes** **HIV** **Other**

1597 **(s).....**

1598 **9.2.2. Female sexual function index- 19 (FSFI- 19)**

1599 **Domaine 1**

1600 **Desire/interest:** feeling of willing to have sexual experience, thinking or fantasizing about
1601 having sex or feeling receptive to a partner's sexual initiation

1602 3. How often did you feel sexual interest/desire over the past 4 weeks?

- 1603 5 = Almost always or always
1604 4 = Most times (more than half the time)
1605 3 = Sometimes (about half the time)
1606 2 = A few times (less than half the time)
1607 1 = Almost never or never

1608 4. How would you rate your degree/level of sexual desire/interest over the last four
1609 weeks?

- 1610 5 = Very high
1611 4 = High
1612 3 = Moderate
1613 2 = Low
1614 1 = Very low or none at all

1615

1616 **Domain 2**

1617 Sexual arousal is a feeling that includes both physical and mental aspects of sexual
1618 excitement. It May include feelings of warmth or tingling in the genitals, lubrication
1619 (wetness), or muscle contractions.

1620 3. Over the past 4 weeks, how often did you feel sexually aroused (“turned on”) during
1621 sexual activity or intercourse?

- 1622 5 = Almost always or always
1623 4 = Most times (more than half the time)
1624 3 = Sometimes (about half the time)
1625 2 = A few times (less than half the time)
1626 1 = Almost never or never
1627 0 = No sexual activity

1628 4. Over the past 4 weeks, how would you rate your level of sexual arousal (“turn on”)
1629 during sexual activity or intercourse?

1630 5 = Very high

1631 4 = High

1632 3 = Moderate

1633 2 = Low

1634 1 = Very low or none at all

1635 0 = No sexual activity

1636 5. Over the past 4 weeks, how confident were you about becoming sexually aroused during
1637 sexual activity or intercourse?

1638 5 = Very high confidence

1639 4 = High confidence

1640 3 = Moderate confidence

1641 2 = Low confidence

1642 1 = Very low or no confidence

1643 0 = No sexual activity

1644 6. Over the past 4 weeks, how often have you been satisfied with your arousal (excitement)
1645 during sexual activity or intercourse?

1646 5 = Almost always or always

1647 4 = Most times (more than half the time)

1648 3 = Sometimes (about half the time)

1649 2 = A few times (less than half the time)

1650 1 = Almost never or never

1651 0 = No sexual activity

1652 **Domaine 3: Lubrication**

1653 7. Over the past 4 weeks, how often did you become lubricated (“wet”) during sexual
1654 activity or intercourse?

1655 5 = Almost always or always

1656 4 = Most times (more than half the time)

1657 3 = Sometimes (about half the time)

1658 2 = A few times (less than half the time)

1659 1 = Almost never or never

1660 0 = No sexual activity

1661 8. Over the past 4 weeks, how difficult was it to become lubricated (“wet”) during sexual
1662 activity or intercourse?

1663 5 = Not difficult

1664 4 = Slightly difficult

1665 3 = Difficult 2

1666 = Very difficult 1

1667 = Extremely difficult or impossible

1668 0 = No sexual activity

1669 9. Over the past 4 weeks, how often did you maintain your lubrication (“wetness”) until
1670 completion of sexual activity or intercourse?

1671 5 = Almost always or always

1672 4 = Most times (more than half the time)

1673 3 = Sometimes (about half the time)

1674 2 = A few times (less than half the time)

1675 1 = Almost never or never

1676 0 = No sexual activity

1677 10. Over the past 4 weeks, how difficult was it to maintain your lubrication (“wetness”) until
1678 completion of sexual activity or intercourse?

1679 5 = Not difficult

1680 4 = Slightly difficult

1681 3 = Difficult

1682 2 = Very difficult

1683 1 = Extremely difficult or impossible

1684 0 = No sexual activity

1685 **Domaine 4: Orgasm**

1686 11. Over the past 4 weeks, when you had sexual stimulation or intercourse, how often did
1687 you reach orgasm (climax)?

1688 5 = Almost always or always

1689 4 = Most times (more than half the time)

1690 3 = Sometimes (about half the time)

1691 2 = A few times (less than half the time)

1692 1 = Almost never or never

1693 0 = No sexual activity

1694 12. Over the past 4 weeks, when you had sexual stimulation or intercourse, how difficult
1695 was it for you to reach orgasm (climax)?

1696 5 = Not difficult

1697 4 = Slightly difficult

1698 3 = Difficult

1699 2 = Very difficult

1700 1 = Extremely difficult or impossible

1701 0 = No sexual activity

1702 13. Over the past 4 weeks, how satisfied were you with your ability to reach orgasm
1703 (climax) during sexual activity or intercourse?

1704 5 = Very satisfied

1705 4 = Moderately satisfied

1706 3 = About equally satisfied and dissatisfied

1707 2 = Moderately dissatisfied

1708 1 = Very dissatisfied

1709 0 = No sexual activity

1710 **Domaine 5: Satisfaction**

1711 14. Over the past 4 weeks, how satisfied have you been with the amount of emotional
1712 closeness during sexual activity between you and your partner?

1713 5 = Very satisfied

1714 4 = Moderately satisfied

1715 3 = About equally satisfied and dissatisfied

1716 2 = Moderately dissatisfied

1717 1 = Very dissatisfied

1718 0 = No sexual activity

1719 15. Over the past 4 weeks, how satisfied have you been with your sexual relationship with
1720 your partner?

1721 5 = Very satisfied

1722 4 = Moderately satisfied

1723 3 = About equally satisfied and dissatisfied

1724 2 = Moderately dissatisfied

1725 1 = Very dissatisfied

1726 16. Over the past 4 weeks, how satisfied have you been with your overall sexual life?

1727 5 = Very satisfied

1728 4 = Moderately satisfied

1729 3 = About equally satisfied and dissatisfied

1730 2 = Moderately dissatisfied

1731 1 = Very dissatisfied

1732 **Domaine 6: Pain**

1733 17. Over the past 4 weeks, how often did you experience discomfort or pain during vaginal
1734 penetration?

1735 5 = Almost never or never

1736 4 = A few times (less than half the time)

- 1737 3 = Sometimes (about half the time) 2 =
- 1738 Most times (more than half the time)
- 1739 1 = Almost always or always
- 1740 0 = Did not attempt intercourse
- 1741 18. Over the past 4 weeks, how often did you experience discomfort or pain following
- 1742 vaginal penetration?
- 1743 5 = Almost never or never
- 1744 4 = A few times (less than half the time)
- 1745 3 = Sometimes (about half the time)
- 1746 2 = Most times (more than half the time)
- 1747 1 = Almost always or always 0 = Did not attempt intercourse
- 1748 19. Over the past 4 weeks, how would you rate your level (degree) of discomfort or pain
- 1749 during or following vaginal penetration?
- 1750 5 = Very low or none at all
- 1751 4 = Low
- 1752 3 = Moderate
- 1753 2 = High
- 1754 1 = Very high
- 1755 0 = Did not attempt intercourse
- 1756 **Thank you for your time**
- 1757
- 1758 **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					

1759 A score of ≤ 26.55 classifies the woman as FSD while a score of > 26.55 classifies a sexually
1760 functional

1761

1762

Appendix 3: Term definition

1763 In this research the following terms refer to the following meaning

1764 **9.3.1 Natural menopause** is the permanent cessation of menstrual periods, determined
1765 retrospectively after a woman has experienced 12 months of amenorrhea without any other
1766 obvious pathological or physiological cause. It is a reflection of complete, or nearly
1767 complete, ovarian follicular depletion, which result in hypoestrogenemia and increase blood
1768 concentration of follicle- stimulating hormone.^{44 45}

1769 **9.3.2 Menopausal status**

1770 Pre menopause: period in which the middle- aged women still have regular menstruation.⁴⁹

1771 Perimenopause: period in which the middle- aged women have menstruation irregularities
1772 and change in the usual bleeding pattern. (menopausal transition)⁴⁶

1773 Post-menopause: period in which the middle-aged women have no more menstruation for a
1774 period of at least 12 months.⁴⁷

1775 **9.3.3 Sexual function:** defined as the way the body reacts/responds to different stages of
1776 the sexual response cycle which includes sexual desire/libido, arousal, lubrication, orgasm,
1777 and resolution.⁴⁵

1778 Desire/libido: feeling of having sexual activity; it includes sexual thought, images or wishes.
1779 ⁴⁵

1780 Arousal/excitement: feeling of sexual pleasure accompanied by physiological changes such
1781 as: Vasocongestion and increase in respiratory rate, blood pressure as well as heart rate.⁴⁵

1782 Orgasm: is the peak of sexual pleasure which is accompanied with accompanied with the
1783 release of sexual tension, rhythmic contraction of the sense of general well- being and
1784 perianal muscles. ⁴⁵

1785 Resolution/satisfaction: it is the sense of general well-being and muscle relaxation following
1786 sexual acttivity.⁴⁵

1787 Pain: it is the experience of discomfort or pain during vaginal penetration. ⁴⁵

1788 **9.3.4. Sexual dysfunction** is a recurrent or persistent problem/difficulty affecting one or
1789 more stage(s) of the women sexual response cycle that results in causing distress or affects
1790 negatively the relationship with the partner.⁵

1791

1792 **Appendix VIII: Application for title change**

1793



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 _____

=====

Supervisor 1 – Name & Surname: Deirdre P. Petronis

Department: Family Medicine

Supervisor Telephone: 082 555 5597 Supervisor E-mail: Deirdre.P.Petronis@uhs-ucg.ga

Supervisor Signature:  Date: 10 June 2024

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

Shabir Moosa	<u></u>	2021.06.14	
(Name and Surname)	(Si)	15:21:06	14th June 2021
		+02'00'	(Date)

POSTGRADUATE STAFF:

_____	_____	_____
(Name and Surname)	(Signature)	(Date)

DECISION OF CHAIR OF THE PG AFFAIRS:

Comments:

Signature: _____ Date: _____