Influence of Covid-19 Social Restriction Measures on Sexual Behaviours and Reproductive HealthOutcomes of Young Adults in Rivers State, Nigeria

Original Research Article

Abstract

Introduction: The COVID-19 social restriction measures, a strategy to curb the spread of the COVID-19 virus influenced people's general well-being worldwide especially their sexual health.The study examined the influence of Covid-19 social restriction measures on sexual behaviours and reproductive healthoutcomes of young adults in Rivers State, Nigeria

Methods: This study is a descriptive online-based cross-sectional design conducted among young adults aged 18-25 years. A structured questionnaire was designed using Google form and the link shared online for completion via Facebook and WhatsApp group platforms with a request to forward the link to their peers. The data was subjected to descriptive analysis using SPSS version 22.

Results: More than half 65% of the respondents were female, and 68.7% were between the ages of 21-25 years. The majority 76.3% of the respondents had sexual experience. There was a decrease in satisfaction with sex life (from 65.9% to 47.9%) and decline in condom non-usage (from 39.8% to 45%) before and during the COVID-19 social restriction measuresrespectively. There was an increase in sexual activities (from 11.9% to 19.4% 2-3 times a week), increase in masturbation (from 12.1% to 31.7%) and in pornography (from 45% to 59.2%) before and during the COVID-19 social restriction measures respectively. About 47.4%were pregnant or impregnated someone and 19.2% of the young adults reported being infected with STI or HIVduring the COVID-19 social restriction measures. The young adults experienced difficulties accessing contraceptives and STI management services.

Conclusion: The COVID-19 social restriction measures impacted sexual behaviours, reproductive health outcomes,and the availability, accessibility and utilization sexual and reproductive services by young adult

Key words: COVID-19, Social restriction measures, Sexual behaviours, Reproductive Health Outcomes, Young adults

Introduction

"Coronavirus disease 2019 (COVID-19) is defined as illness caused by a novel coronavirus known as severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2; formerly called 2019-nCoV), which was first identified amid an outbreak of respiratory illness cases in Wuhan City, Hubei Province, China" (Wu, et al., 2020)."Between April, 18-28, 2020, the death rate increased up to 485,423 across 215 countries due to COVID-19 (WHO, 2020). As a result the World Health Organization (WHO), regional and local health bodies adopted measures to stop the further spread of the disease, and tasked the public and the leadership of various countries to enforce the measures necessary to limit the spread of the virus such as social distancing, regular hand washing, lockdown and closing of borders" (WHO, 2020)."Across the globe, countries have implemented a number of control measures to comprehensively prepare for and respond to COVID-19"(Wu, et al., 2020). "WHO developed a global COVID-19 response strategy to control the pandemic with the ultimate aim of maintaining a low-level in transmission" (WHO, 2020). "The goal was to suppress transmission and provide care for all patients, with the intensity of implementation using control measures to achieve social measures at individual and community levels" (WHO, 2020).

"Social distancing measures were implemented globally in order to slow the spread of the disease during the Covid-19 pandemic"(Harris et al., 2020). "Social distancing or physical distancing is a set of non-pharmaceutical interventions or measures taken to prevent the spread of a contagious disease by maintaining a physical distance between people and reducing the number of times

people come into close contact with each other" (Harris et al., 2020; Johnson, et al., 2020). "It involves keeping a distance of six feet or two meters from others and avoiding gathering together in large groups" (Sagar et al., 2020; CDC, 2020). "These social restriction and self-isolation measures prompted the widespread closure of primary, secondary, and post-secondary schools in more than 120 countries. As of 23 March 2020, more than 1.2 billion learners were out of school due to school closures in response to COVID-19"(UNESCO, 2020). "A third of the world population were under some kind of lockdown enforced by their government which means their movement was being restricted actively" (Ren, 2020; Wu, et al., 2020). "In Nigeria, over 250 million people were ask to stay at home, 1.3 billion in India, 760 million in China, more than 200 million in the USA, 300 million in Europe and UK were under lockdown, several counties in Latin America and Asia were also under severe lockdown due to the Covid-19 pandemic" (WHO, 2020).

"A shift was observed worldwide regarding social interactive behaviours as a result of Corona virus-19 outbreak since the start of 2020" (WHO, 2020). "COVID-19 radically changed social relations in the World, because of the restrictions imposed by the various States resulting in the feeling of fear of the contagion" (WHO, 2020). "In Nigeria, lockdown measures where enforced first in Abuja, Lagos and Ogun State, then subsequently to other states" (Odutola, 2020). "There was lockdown of schools, markets, work place, and restriction of human and vehicular movements across other states" (Akwagyiram, 2020). "In Rivers State, social restriction measures were enforced in March, 2020", (Ahmed, et al., 2020, March 22).

The COVID-19 pandemic highly affected people's general well-being worldwide (Cao et al.,2020; Wang et al., 2020) especially their sexual health. "Sexual health is an important aspect of general wellbeing, with important consequences on the population's daily lives" (Ford et al.,

2019). “Sexual behaviour is the manner in which humans experience and express their sexuality, ranging from activities done alone such as masturbation, to acts with another person such as oral sex, sexual intercourse, none penetrative sex” (WHO, 2006). Yuksel and Ozgor (2020) proposed that “during the COVID-19 pandemic people may spend more time at home and may lead to increased frequency of sexual behaviours with their partners especially among the young adults”. “Young Adults age is a critical age in which people need to undergo sexual development” (Tura et al., 2020). “Recent data indicated that 1.2 billion people in the world are young adults aged 10-19 years” (WHO, 2019). “Young adults are slightly at an increased level of vulnerability for different health conditions including sexually transmitted diseases when compared to the adult population” (Nicholson, 2016). “Risky sexual behaviour is characterized by different hazardous behaviours such as premarital sex, multiple sexual partners and unprotected sex. Such hazardous sexual behaviours are reported to end up with unpleasant reproductivehealth outcomes like HIV/AIDS, unwanted pregnancies, and unsafe abortions” (Alamrew et al., 2018).

While it is well known that distress can impair sexuality (Montesi et al., 2013), the outcomes of COVID-19 effects on the population’s sexual life during the lockdown is yet unknown. “It is established that young adults involved in unsafe sexual behaviours are prone to deleterious health outcomes” (WHO, 2006). “Researchers have showed that young adults involved in harmful sexual behaviours had some health outcomes such as unintended pregnancy (7.2%), STI’s/HIV (4.8%), social impact (such as school drop-out (3.2%), low socio-economic status (18.3%) and psychological consequences (such as depression (2.3%), anxiety (3.0%)” (Kibret, 2003; Ola et. al, 2009; CDC. 2019). “In particular, it is not clear whether sexual behaviours among young adults have changed during the lockdown” (Arafat et al., 2020). “Studies have been conducted and had shown that distress can impair sexuality”(Montesi et al., 2013). Studies

had been conducted on the psychological (Ahmed, et al., 2020) and socio-economic (Marie Stopes International, 2020) impact of COVID-19 social restriction measures. However there is paucity of data on the influence of Covid-19 social restriction measures on sexual behaviours of young adults in Rivers State. Understanding the effects of these social restrictions is a vital step towards effective services, support, and strategies to improve young adults' access and utilization of sexual and reproductive health services.The study was conducted to examine the influence of COVID-19 social restriction measures on sexual behaviours andreproductive healthoutcomes among young adultsin Rivers State. The outcome of this study will inform public health researchers, policy and the government on strategies to curbharmful sexual activities of young adults especially during a pandemic.

Materials and methods

Study Area

Port Harcourt is the capital of Rivers State and the third largest city in southern Nigeria. It is a diverse city located in the Niger Delta region (within latitude 4049′27″N 702′1″E) and is economically significant as the center of Nigeria's oil industry. It is bounded by Oyibo to the east, Eleme, Degema and Port Harcourt city to the south, Ikwerre and Etche to the north and Emohua LGA to the west, with its original occupants being the Ikwerre but housing people of diverse cultures. According to National Bureau of Statistics (2016) the projected population of the young adults between 15-24 years was 2,629,412 being 36% of the entire population. It is one of the major centres of economic activities in Nigeria as well as a major city in Niger Delta.

Study Design and population

This study is a descriptive cross-sectional design conducted among young adults. The study population were young people aged 18-25 years as defined by the Society of Adolescent Health and Medicine. Both male and female young adults residing in Rivers state during the pandemic were eligible to participate in the study. Young people who did not have a phone and internet source was excluded because the study was online based.

Sample Size Determination

A sample size was determined using fisher's formula as shown below: $n = z^2 p q/d^2$

Where; n = sample size, z = confidence level 95% $(1.96)^2$, p (proportion) = 36% = 0.5 [The figure of 50% suggesting that the prevalence is largely unknown was employed because, there was a paucity of empirical studies on sexual orientation in Nigeria and there are great disparities in global figures depending on the region being investigated],.

q = 1-p = 0.5, d^2 = confidence interval = 5% = 0.05^2 = 0.0025

$$n = \frac{(1.96)^2 \times 36\% \times 0.5}{(0.05)^2}$$

$$n = \frac{3.8416 \times 0.5 \times 0.5}{0.0025}$$

$$n = \frac{0.9604}{0.0025}$$

n = 384

Adding 10% non-response rate, which is 36, the sample size becomes; n = 422

Therefore, the sample size = 422.

Data collection procedures

A structured questionnaire was designed using Google form and distributed online for completion to expedite data collection. Young adults were randomly selected to take part in the study using Facebook and WhatsApp among other social media platforms. The questionnaire

link was sent to individuals through Facebook and WhatsApp,with a request to forward the information within their peers. The procedure involved agreeing to an online consent form. All data were confidential and stored in a password-protected electronic format.

Study Instrument, Data Analysis and Management

The study questions were adapted by the quantitative International Sexual Health and Reproductive Health study (I-SHARE, 2021) initiated by Academic Network for Sexual and Reproductive Health and Rights Policy (ANSER, 2021).The questionnaire were validated by giving a copy of the research objectives, questions, and hypothesis alongside the questionnaire to experts in Public Health and my supervisor for face and content validity. Their suggestions and corrections were affected to produce the final copy of the questionnaire.The reliability of the instrument was ascertained by a pre-test method, after which the instrument was subjected to a reliability test using the Pearson product moment correlation to ascertain the reliability coefficient. A reliability coefficient of 0.70 was obtained indicating the instrument is reliable for use. The data was analysed using SPSS version 22. The data was subjected descriptive analysis (Mean, Standard Deviation and Frequency).

Results

Table 1 shows that the socio-demographic characteristics of the young adults in Rivers State Nigeria. More than half 276(65.0%) of the respondents were female, and 290(68.7%) of the respondents were between the ages of 21-25 years. Slightly above half 249(56.9%) of the respondents reside in towns, the majority 373(88.4%) are unemployed, and most,362 (85.8%) are Christians.About a half 244 (57.8%) were living together with a partner both legally and not legally married.

Table1: Socio-demographic characteristics of young adults in Rivers state Nigeria

Variables	Frequency (n=422)	Percentage (%)
Sex		
Male	146	35.0
Female	276	65.0
Age		
18-21	132	31.3
22-25	290	68.7
Residence		
Capital	132	37.4
Town	240	56.9
Village	24	5.7
Employment Status		
Unemployed	373	88.4
Self-employed	37	8.8
Employed	12	2.8
Religion		
Christian	362	85.8
Muslim	16	3.8
Traditional	44	10.4
Relationship status		
Single and never had a partner	8	1.9
Single but had a partner previously	26	6.1
In a relationship but not living together	71	16.8
Not legally married but living with a partner	154	36.5
Legally married and living with my partner	90	21.3
Legally married and not living together	73	17.3

Influence of COVID 19 Social Restriction Measures on Sexual Behaviours of Young Adults in Rivers state Nigeria

The majority (76.3%) of the respondents had sexual experience. More than half (62.1%)of the respondents had a steady partner before the COVID-19 social restriction measures while (64.0%) had steady partner during the months of COVID-19 social restriction measures.More than half of the respondents (65.9%) were very satisfiedwith their sex life before and while less than half (47.9%) of the respondents were very satisfied during the COVID-19 social restriction measures.

About 73.9% and 72.5% of the young adults have never experienced sexual problems such as getting an erection, or loss of sexual interest, arousal, and orgasm, sexual satisfaction before and during the COVID-19 social restriction measures. More than half (67.8%) of the younger adults hugged, kissed, held hands with or cuddled with their steady partner 4 or more times a week before the COVID-19 social restriction measures and there was a slight increase to 70.1% during the COVID-19 social restriction measures.

More than half (59.2%) and (50.7%) of the respondents often engaged in sexual activities 4 or more time a week with their partner months before and during the COVID-19 social restriction measures. About 39.8% of the respondent always used condom when having sex with their partner before the COVID-19 social restriction measures however a decline in condom use (45.0%) was found among the respondents during the COVID-19 social restriction measures.Shown in Table 2

Table 2: Influence of COVID 19 Social Restriction Measures on Sexual Behaviours of Young Adults in Rivers state Nigeria

Variables	(N = 422)	(%)
Have you ever had a sexual experience		
Yes I have	322	76.3
No I haven't	100	23.7
Did you have a steady partner before the COVID-19 social restriction measures		
Yes I did	262	62.1
No I didn't	60	14.2
Not applicable	100	23.7
Did you have a steady partner during the months of COVID-19 social restriction measures		
Yes I did	270	64.0
No I didn't	52	12.3
Not applicable	100	23.7
How satisfied were you with your sex life before the COVID-19 social restriction measures		
Very satisfied	278	65.9
Somewhat satisfied	34	8.0
Not very satisfied	8	1.9
Not at all satisfied	2	0.5
Not applicable	100	23.7
How satisfied were you with your sex life during the COVID-19 social restriction measures		
Very satisfied	202	47.9
Somewhat satisfied	113	26.7
Not very satisfied	5	1.2
Not at all satisfied	2	0.5
Not applicable	100	23.7
How often have you or your partner experienced sexual problems (problems getting an erection, or loss of sexual interest, arousal, orgasm, sexual satisfaction) before the COVID-19 social restriction measures		
Never	312	73.9
Once	2	0.5
Sometimes	6	1.4
Often	2	0.5
Not applicable	100	23.7

How often have you or your partner experienced sexual problems (problems getting an erection, or loss of sexual interest, arousal, orgasm, sexual satisfaction) during the COVID-19 social restriction measures	306	72.5
Never	6	1.4
Once	2	0.5
Sometimes	8	1.9
Often	100	23.7
Not applicable		
How many times have you …Hugged, kissed, held hands with or cuddled with your steady partner before the COVID-19 social restriction measures		
Monthly/less	1	0.2
2-4 times a month	5	1.2
2-3 times a week	30	7.1
4 or more times a week	286	67.8
Not applicable	100	23.7
How has this changed during the COVID-19 social restriction measures		
No change	270	64.0
Much less change than before	27	6.4
A bit less change than before	10	2.4
About the same	12	2.8
A bit more than before	1	0.2
A lot more than before	2	0.5
Not applicable	100	23.7
How often have you engaged in sexual activities with your partner months before the COVID-19 social restriction measures (By sexual activities we mean oral, vaginal, and intercourse or touching)		
Never	100	23.7
Monthly/less	2	0.5
2-4 times a month	20	4.7
2-3 times a week	50	11.9
4 or more times a week	250	59.2
How often have you engaged in sexual activities with your partner during the COVID-19 social restriction measures (By sexual activities we mean oral, vaginal, and intercourse or touching)		
Never	100	23.7
Monthly/less	1	0.2
2-4 times a month	25	5.9
2-3 times a week	82	19.4

4 or more times a week	214	50.7
How often did you used condom when having sex with your partner before COVID-19 social restriction measures		
Never	189	44.8
Rarely	3	0.7
Sometimes	132	31.3
Most of the time	18	4.3
Always	168	39.8
Not applicable	100	23.7
How has this changed during the COVID-19 social restriction measures		
Decreased a lot	190	45.0
Decreased a bit	118	28.0
Stayed the same	14	3.3
Increased a bit	-	-
Increased a lot	-	-
Not applicable	100	23.7

Influence of COVID 19 Social Restriction Measures on Masturbation and Pornography of Young Adults in Rivers state Nigeria

Table 3 shows that 12.1% of younger adult's masturbated 4 or more times a week before the Covid-19 social restriction measures and it increased to31.7% during the COVID-19 social restriction measures. About 45.0% of the respondents watched sexually explicit videos (pornography) 2 – 3 times before the COVID-19 social restriction measures while during the COVID-19 social restriction measures it increased to about 59.2%. Furthermore, 16.6% of the respondents' performed/watched sexual acts 4 or more time before a webcam before the COVID-19 social restriction measures and increased to 20.8% during the COVID-19 social restriction measures.

Table 3: Influence of COVID-19 Social Restriction Measures on Masturbation and Pornography use among Young Adults in Rivers State

Variables	Frequency (n =422)	Percentage (%)
How often have you masturbated yourself before COVID-19 social restriction measures		
Never	100	23.7
Monthly or less	28	6.6
2-4 times a month	74	17.5
2-3 times a week	69	16.4
4 or more times a week	51	12.1
Not Applicable	100	23.7
How often did you masturbate yourself during the COVID-19 social restriction measures		
Decreased a lot	87	20.6
Decreased a bit	32	7.6
Stayed the same	69	16.4
Increased a bit	92	21.8
Increased a lot	42	9.9
Not Applicable	100	23.7
How often do you watch sexually explicit videos (pornography) before the COVID-19 social restriction measures		
Never	100	23.7
Monthly or less	19	4.5
2-4 times a month	23	5.5
2-3 times a week	190	45.0
4 or more times a week	90	21.3
How often do you watch sexually explicit videos (pornography) during the COVID-19 social restriction measures		
Decreased a lot	10	2.4
Decreased a bit	13	3.1
Stayed the same	49	11.6
Increased a bit	120	28.4
Increased a lot	130	30.8
Not Applicable	100	23.7
How often do you perform/watch sexual acts before a webcam before the COVID-19 social restriction measures		
Never	289	68.5
Monthly or less	7	1.7
2-4 times a month	36	8.5
2-3 times a week	20	4.7
4 or more times a week	70	16.6
How often do you perform/watch sexual acts before a webcam during the COVID-19 social restriction measures		
Decreased a lot	20	4.7
Decreased a bit	19	4.5
Stayed the same	46	10.9

Increased a bit	38	9.0
Increased a lot	50	11.8

Influence of COVID 19 Social Restriction Measures on Reproductive Health Outcomes of Young Adults in Rivers state Nigeria

The result shows that 200 (47.4%) of young adult were pregnant or impregnated someone during the COVID-19 social restriction measures. Among those that were pregnant during the covid-19 social restriction, 7% recently had a baby. About a quarter 100 (23.7%) were in need to abortion services and 55 (13%) utilized medical abortion (taking pills e.g. misoprostol) while the COVID-19 social restriction measures hindered some 30 (7%) young adults from obtaining abortion services. About 70 (16.6%) of the respondents used self-medication service for their abortion before the covid-19 social restriction measures while there was a reduction, about 8 (1.6%) reported self-medicating during the Covid-19 social restriction measures. About 34 (8.1%) experienced some sort delay in obtaining abortion care during the COVID-19 social restriction measures.

During the Covid-19 social restriction measures, 81(19.2%) of the young adults reported being infected with STI or HIV. About 132 (31.3%) of the respondents wanted to test for HIV or STI and 74 (17.5%) were hindered by Covid-19 social restriction measures, majorly 38 (9%) due to lack of transport system. In addition, 98 (23.2%) of the respondents used pharmacy services to obtain a test for HIV or another sexually transmitted infection before the covid-19 social restriction measures however there was a decline, about 48 (11.4%) of the respondents reported using pharmacy services to obtain a test for HIV or another sexually transmitted infection during the Covid-19 social restriction measures.Thirteen (3.1%) of the young adults reported testing positive to HIV while a half 211 (50%) prefer not to disclose their status. As shown in Table 4

Table 4: Influence of COVID 19 Social Restriction Measures on Reproductive Health Outcomes of Young Adults in Rivers state Nigeria

Variables	(N = 422)	(%)
Where you ever pregnant or impregnated someone during the COVID-19 social restriction measures		
Yes I was/did	200	47.4
No I wasn't/didn't	122	28.9
Not applicable	100	23.7
How many times have you been pregnant in your life		
Once	182	43.1
Two-five times	44	10.4
Not applicable	196	46.4
What best describes your current situation		
Currently pregnant or probably pregnant	130	30.8
Currently trying to be pregnant	49	11.6
Recently had a baby (during the COVID-19 social distancing measures)	30	7.1
Not currently pregnant and don't wish to be pregnant in the future	13	3.1
Not currently pregnant and wish to be pregnant in the future	50	11.8
Cannot have children (fertility issue/medical issue)	4	0.9
Not applicable	146	35.0
During the COVID-19 social restriction measures have you been in need of a termination of pregnancy (abortion)		
Yes, I was	100	23.7
No, I wasn't	126	28.9
Not applicable	196	46.4
Did you have an abortion during the COVID-19 social restriction measures		
No I didn't	156	37.0
Yes a medical abortion (taking pills e.g. misoprostol)	55	13.0
Yes a surgical abortion	5	1.2
Yes with other method	10	2.4
Not applicable	196	46.4
Has the COVID-19 social restriction measures hindered you from seeking abortion		
Yes, it did	30	7.1
No, it didn't	70	16.6
Not applicable	322	76.3
What services would you use to obtain an abortion before the		

COVID-19 social restriction measures		
Never had an abortion before the COVID-19/not applicable	200	47.4
Family physician/general practitioner	38	9.0
Hospital or health center doctor/nurse	50	11.8
Online services	12	2.8
Telephone services	7	1.6
Self-medication	70	16.6
Abortion clinic	30	7.1
Through a civil society organization for abortion	5	1.2
Other services	10	2.4
What services did you use to obtain an abortion during the COVID-19 social restriction measures		
Didn't have an abortion during the COVID-19/not applicable	352	83.4
Family physician/general practitioner	2	0.5
Hospital or health center doctor/nurse	5	1.2
Online services	3	0.7
Telephone services	2	0.5
Over the counter services (pharmacy)	43	10.2
Traditional healer	3	0.7
Self-medication	8	1.6
Abortion clinic	2	0.5
Through a civil society organization for abortion	2	0.5
Did you experience any delays in obtaining abortion care during the COVID-19 social restriction measures		
No	36	8.5
Yes a few days	10	2.4
Yes 1-2 weeks	11	2.6
Yes 3-4 weeks	13	3.1
Not applicable	352	83.4
During the COVID-19 social restriction measures did you get infected with STI or HIV		
Yes I was infected	81	19.2
No I wasn'tinfected	241	57.1
Not applicable	100	23.7
During the COVID-19 social restriction measures have you wanted a test for HIV or another sexually transmitted infection (STI)		
Yes I wanted	132	31.3
No I never wanted	190	45.0
Not applicable	100	23.7
Has the COVID-19 situation stopped or hindered you from accessing a test for HIV or another sexually transmitted		

infectionYes I did	74	17.5
No I didn't	248	58.8
Not applicable	100	23.7
How did the COVID-19 social restriction measures stop or hinder you from accessing a test for HIV or another sexually transmitted infection		
No transport available	38	9.0
Pharmacy closed	12	2.8
I couldn't afford it	6	1.4
Health centre/clinic not accessible at this time	6	1.4
Not allowed to leave the house	8	1.9
Health workers not offering providing HIV STI testing services	4	0.9
Not applicable	348	82.5
What services did you use to obtain a test for HIV or another sexually transmitted infection before the COVID-19 social restriction measures		
Never needed a test before COVID-19/not applicable	230	54.5
Family physician/general practitioner	2	0.5
Hospital or health center	20	4.7
Online services	2	0.5
Telephone services	6	1.4
Over the counter services (pharmacy)	98	23.2
Traditional healer	11	2.6
Self-medication	53	12.6
What services did you use to obtain a test for HIV or another sexually transmitted infection during the COVID-19 social restriction measures		
Never needed a test during COVID-19/not applicable	319	75.3
Family physician/general practitioner	2	0.5
Hospital or health center	17	4.0
Online services	4	0.9
Telephone services	8	1.9
Over the counter services (pharmacy)	48	11.4
Traditional healer	2	0.5
Self-medication	23	5.5
Have you ever tested positive for HIV		
Yes I have	13	3.1
No I haven't	198	46.9
Prefer not to answer	211	50.0

Discussion

This study was conducted to investigate the influence of Covid-19 social restriction measures on sexual behavioursand reproductive health outcomes of young adults in Rivers State, Nigeria. Social restriction measures were part of the strategies by the World Health Organization to curtail the spread of the COVID-19 virus. These social restriction involved lockdown and closing of borders (WHO, 2020). In Rivers state Nigeria, the social restriction was within March to July 2020. During these periods, schools, social clubs, churches, markets, recreational centres and borders were shut down. There was lock down of individuals in their home with restricted movements.

The study revealed that the majority (76.3%) of young adults have had some sort of sexual experience. This was in line with a study conducted in Southern Nigeria that found that 73.6% of the young adults in tertiary institutions had sexual experience (Eze et al., 2018). Also similar to the results of a study by Magnusson et al. (2019) conducted on the early sexual debut and risky sex in young adults which showed that nearly 70% of the young adults have had sexual intercourse. Another study conducted among undergraduates in South-Eastern Nigeria found that 68.8% were sexually active; this was slightly lower than the current study findings (Brian et al., 2016). These statistics point to a high level of sexual activities among young adults and demonstrates the urgent necessity for health education on sexual and reproductive health.

The current study revealed that during the COVID-19 social restriction measures different dynamics in the young adults' sexual activities were revealed. There was a slight increase in young adults having a steady partner and cuddling. More than half (62.1%)of the young adults had a steady partner before the COVID-19 social restriction measures which slightly increased to (64.0%) during the months of COVID-19 social restriction measures.In the same vein, more than

half (67.8%) of the young adults hugged, kissed, held hands with or cuddled with their steady partner more frequently before the COVID-19 social restriction measures and there was a slight increase to 70.1% during the COVID-19 social restriction measures. This increase in steady partner may be caused movements restrictions during the pandemic, also some of the young adults may have been locked down with their sexual partners during the COVID-19 social restriction. This demonstrates the importance of health awareness on sexual health for general health and wellbeing during the COVID-19 pandemic or any other movement restrictions measures.

Although the young adults reported an increase in having a steady partner during the COVID-19 social restriction measures, there was a decline in sexual satisfaction from 65.9% to 47.9% before and during the COVID-19 social restriction measures respectively. This is similar with studies conducted in Turkey, Egypt, and Italy that found a decreasein sexual satisfaction during the lockdown (Kaya et al., 2021; Samir et. al., 2021; De Rose et al., 2021). This was also similar with findings by I-SHARE countries (Erausquin et al., 2021; Fischer et al., 2022).This decrease in sexual satisfaction during COVID-19 social restriction measures may be due to prolonged forced cohabitation among partners or lack of access to other sexual partners.This decrease in sexual satisfaction may cause a stress and strain on the young adults.

There was a slight decrease in sexual frequency among young adults from 59.2% to 50.7% before and during the COVID-19 social restriction measures respectively. This result is similar to the studies by Michele, et al., (2020) and Li et al., (2020) that recorded a decrease in sexual activities by the Italian women and China men and women respectively. In corroboration, Jacob, et al. (2020)carried out a study on challenges in the practice of sexual medicine in the time of Covid-19 in the United Kingdom andfound that many young people had decreased sexual desire

and frequency of sexual intercourse due to COVID-19. In contrast, a study conducted in Spain found an increase in the frequency of sexual intercourse during the COVID-19 pandemic compared to that of the pre-pandemic period (Ballester-Arnal et al., 2020).The similarities from the current and prior studies may be due to the fear of contagion, the stressful situation, and the change in daily life pattern recorded from that study.Nevertheless, since there were social restrictionssome of the young adults may have engaged in unprotected sexual intercourse leading to negative consequences.

With regards to sexual problems, this study found a slight increase (1.4%) in sexual problemssuch as getting an erection, or loss of sexual interest, arousal, and orgasm during the COVID-19 social restriction measures among young adults. This is similar with findings that found an increase in sexual problems in those in partnership (either oneself or of the partner) during the pandemic (Fischer et al., 2022).In agreement, a study conducted in China reported that 8.4% of the respondent had a deteriorated erectile function and 8.5% a decrease in ejaculation control (Fang et al., 2021). Also, other studies conducted in China and Turkey found a 25% decrease in sexual desires among the study population during the pandemic (Li et al., 2020; Baran et al., 2020). These sexual difficulties experienced during the COVID-19 pandemic may be due to the psychological menace that accompanied the pandemic.

When exploring condom uses among young adults, the current study revealed that before the COVID-19 social restriction measures 39.8% of the young adults always used condom when having sex with their partner however, a decline 45% in condom use was observed among during the COVID-19 social restriction measures.This finding corroborated with the result by Yuksel and Ozgor, (2020) that reported that during the Covid-19 related lockdown there was a decrease in the rate of contraceptive used by women. Also, Huang, et al. (2020) found that there were

interruptions in reproductive health services due to COVID-19, such as prenatal and postnatal examination, delivery and abortion services, contraception availability, and STI management. In addition, they found that even in a country with a sound drug supply system such as China, contraceptives in some areas were out of stock or in short supply during the pandemic. In the same vein, a study conducted byAdelekan, et al. (2021) revealed deficiencies in condom supplies; there was a decrease in the supply of family planning (condom) in the South – South region of Nigeria during the lockdown to 95.8%, and a further decrease after the lockdown to 92.5%. The decline in condom use by young people in these studies may due to lack of vehicular movement, lack of access due to the lockdown restriction measures impounded on the citizens or condom stock out at the health facilities during the lock down. The decline in condom use due to lack of access points to risky sexual behaviours which could lead to unpredicted health outcomes such as contracting STIs and becoming pregnant.

Across the globe, the coronavirus pandemic affected almost all aspects of daily life and to limit the spread of the virus social restriction measures were instituted this affected young adults as they stayed isolated or self-quarantined at homes increasing the incidence of masturbation and pornography.According to this study, 12.1% of younger adult's masturbated 4 or more times a week before the Covid-19 social restriction measures and it increased to31.7% during the COVID-19 social restriction measures. This is in line with a study that found that traditional masturbation and online sexual activities increased during the pandemic and higher in men and women (Ballester-Arnal et al., 2020). Another study done in China found that there was 30% increase in masturbation during the lockdown (Li et al., 2020). However, a study conducted in USA found a decrease in solo and partnered masturbation during the pandemic (Luetke et al., 2020).It is opined that some people used sex as a surviving mechanismfor coping with their

loneliness, depressive symptoms, and even fear of death (Lehmiller,2017;Weber, et al. 2018;Yoder, Virden and Amin, 2015). In a study, Baltazar et al. (2010) reported that people endorsed masturbation and pornography use to cope with negative events of life. The COVID-19pandemic is one of the events that influenced the dynamics in sexual behaviours of young adults. These sexual behaviours (masturbation and pornography use) practiced during the restrictions could continue even after the pandemic impacting their sexual and reproductive health in adulthood negatively.

In exploring the incidence of pornography, it was recorded that 45.0% of the young adults watched sexually explicit videos (pornography) 2 – 3 times before the COVID-19 social restriction measures while during the COVID-19 social restriction measures it increased to about 59.2%. This result is in line with (PornHub, 2020) results that noted a sharp increase in porn searches innations where coronavirus is widespread. One of the most popular porn website reported that their traffic steadilyincreased in March, 2020 as the pandemic has spread, which is in conformity with our findings. Studies in Italy and Turkey also found increase in watching pornography (Cocci et al., 2020; Karagöz et al., 2021). Interestingly, boredom is also considered a possible trigger ofhypersexual behavior by Kafka (2010). This notion is supportedby a psychology research demonstrating that leisureboredom is a significant predictor of masturbation and pornography use, suggesting that young adults consume porn more when theyare bored (Schenk, 2010). Rothman et al. (2015) define masturbation and the use of pornography as a tool to relieve boredom. Similarly, a recent systemic review evaluating the association betweenboredom and hypersexuality identified a link between boredom and increased online sexual activity (De Oliveira and Carvalho, 2020). Therationale behind this boredom effect may

be due to the men's novelty-seeking behaviors to reduce monotony andincrease arousal (Chaneyand Chang, 2015).

Furthermore, 16.6% of young adults' performed or watched sexual acts 4 or more time before a webcam before the COVID-19 social restriction measures and increased to 20.8% during the COVID-19 social restriction measures.A study conducted in Australia found an increase in the use of sex toys (Coombe et al., 2021). Interestingly, this was in line with some studies that investigated sexual function during restrictive social distancing and found how riskperception of COVID-19 was negatively associated with frequencies of sexual activities (Jacob, et al. 2020; Schiavi, et al., 2020; Li, et al., 2020). In particular, ahigher general anxiety during COVID-19 was showed to have a negative impact on sex life and frequencies of sexualintercourse, decreased satisfaction with sex life,performing/watching sexual acts before a webcam andfrequencies of sexual activity (Ko,2020).

The study also investigated the influence of Covid-19 social restriction measures on sexual and reproductive health outcomes among young adults. It was found that 47.0%of the young adult were pregnant or impregnated someone during the COVID-19 social restriction measures, among which 7% had a baby after the lockdown. This may be due to increased time spent together during the lockdown leading to anincrease in sexual activity, and more time to explore new sexual fantasies caused by prolonged cohabitation with partners. This finding is similar to study by Yuksel and Ozgor, (2020) that reported that Covid-19 related lockdown led to increased sexual desire, increased frequency of partner sexual activities, significant decreased in the rate of contraceptive used by women and unplanned pregnancies. These unwanted pregnancies may create a health, social and economic burden of the young adult.

About a quarter 23.7% of the young adults were in need of abortion services, however, a slightly reduced proportion 16.6% was able to terminate their pregnancies during the COVID-19 social restriction measures. While 13% utilized medical abortion (taking pills e.g. misoprostol), 2.4% of the young adults used risky other methods to terminate their pregnancies. About 16.6% of the young adults used self-medication services to terminate their pregnancies before the covid-19 social restriction measures; however there was a reduction only about 1.6% of the young adults reported self-medicating during the Covid-19 social restriction measures. Utilization of crude and risky methods in the termination of unintended pregnancies could lead to morbidity and mortality of the young adult.

This present study also revealed that the COVID-19 social restriction measures hindered a few 7% of the young adults from obtaining abortion services. Among the 13% that obtained abortion services, 8.1% experienced some sort delay in obtaining abortion care during the COVID-19 social restriction measures. This result is similar to the study conducted by a Non-Governmental Organization in Nigeria Individual Personal Assistance Service (IPAS)which reported that an estimated number of 20,625 women were denied safe abortion services in the study sites with lockdowns, and an estimated number of 16,804 women were denied services in the comparison sites without lockdowns. Also, a higher proportion of women who anticipated having abortions were denied safe services in sites with lockdowns (64%) than in comparison sites without lockdowns (49%) (IPAS, 2021). The findings revealed the negative influences of the COVID-19 social restrictions on obtaining sexualand reproductive services among young adults.

Forlornly, it was revealed that during the Covid-19 social restriction measures, 19.2% of the young adults wereinfected with STI or HIV, about 31.3% of them wanted to test for HIV or STI and 17.5% were hindered by Covid-19 social restriction measures, majorly due to lack of

transport system. This result was similar to the study by Iain et al., (2020) noted that 30% of the respondents had reported difficulties accessing to test and/or treatment during lockdown, and 9% were unable to access sexual and reproductive services when needed. Also, 20% reported an STI diagnosis during lockdown, either following a sexual health service attendance or through home testing services. Lipsitch, et al.(2020) speculated that although young people's STI rates may decline because of reduced physical access to sexual partners, delays in getting screened and treated, or the inability to do so, will make the situation worse for those infected.This calls for alternative approaches to deliver SRH care during motility restrictions to curb the accompanying consequences.

In addition, 23.2% of the young adults used pharmacy services to obtain a test for HIV or another sexually transmitted infection before the covid-19 social restriction measures however there was a decline, only 11.4% of the young adults used pharmacy services during the Covid-19 social restriction measures.In accordance with this study, Huang, et al. (2020) found that there were interruptions in reproductive health services due to COVID-19 including STI management during the Covid-19 lockdown period. This buttresses the influence of COVID-19 social restriction measures in accessing STI management on young adults there by negatively impacting sexual and reproductive health outcomes.

Conclusion

In conclusion, the study revealed that a vast majority of young adults have hadsexual experience. During the COVID-19 social restriction measures there was an increase insexual activities, living with a steady partner, and sexual frequency of young adults as a result of the lockdown. In exploring condom usage among young adults, a decline in condom use during the COVID-19

social restriction measures was observed.There was an increase in unplanned pregnancies due to lack of access to contraceptive services, also lack of access to safe abortion services as some young adults used crude and risky methods. Also, a quarter of the young adults were infected with STI or HIV, some wanted testing for HIV or STI and was hindered by Covid-19 social restriction measures. This shows that the COVID-19 social restriction measures impacted on the availability, access and utilization sexual and reproductive service which includes contraceptive use, sexual transmitted infection testing and managements there by negatively influencing the sexual behaviours of young adults in Rivers State Nigeria.Unsafe sexual behaviour and the associated exposure to infection is one of the major causes of preventable mortality in low-income countries according to the World Health Organizations.This clearly revealed that the lockdown restriction measures impounded on the citizens negatively influenced the risky sexual behaviours and outcomes of young adults in Rivers state.

This study made a significant contribution to the body of knowledge by demonstrating the impact of COVID-19 social restriction measures on the sexual behaviours and reproductive health outcomes of young adults in Rivers state Nigeria. The report of this study could help promote a discussion on unmet needs for accessing sexual and reproductive health services and be addressed in case of further restrictions arising in the future. This result could help public health professional and policy makers plan interventions to curb risky sexual behaviours among adolescents and young adults.Despite the contribution to knowledge the study has its limitations, firstly, the questionnaire was distributed online and may be possible for random selection of participants. Secondly, the respondents may experience response fatiguein filling the questionnaire online and this may influence the result of the study.

We recommend an increase in regular, prompt, accurate and timely sex education among adolescents and young adults. Sex education has been proven to lead to positive health outcomes among young people. Also, this sexual education should be available and accessible to all young adults at all times emphasized in their schools, religious organizations, social gatherings and social media platforms. We also recommend that before any enforcement of any lockdown, appropriate measures should be put in place to address the sexual and reproductive health needs of young adults.

Ethical Approval and Consent

Ethical approval was issued by the University of Port Harcourt Ethics committee. Informed consent was obtained from each respondents as the participant were asked to check the box provided after reading the consent form before participating in the survey. The participants were acquainted with the purpose of the study and assured of confidentiality of the information provided. The participation in the survey was purely voluntary. This study would be beneficial to young adults improve their knowledge on healthy sexual relationship when the research is published. This study may have no risk on the participants apart from time spent on responding to the questions in the questionnaire.

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