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MASS MEDIA EXPOSURE AND ITS INFLUENCE ON PELVIC INFLAMMATORY DISEASE PREVENTION BEHAVIOUR AMONG WOMEN OF CHILD BEARING AGE IN THREE SOUTHEASTERN NIGERIAN STATES

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Mass media exposure and its influence on Pelvic Inflammatory Disease Prevention Behaviour among women of child bearing age in three southeastern Nigerian states

Abstract

Objective: This study investigated the influence of available media information on Pelvic Inflammatory Disease awareness, knowledge, perception and preventive practices regarding the condition among women of reproductive age in South-Eastern Nigeria.

Methods: A descriptive survey was used to elicit data from selected respondents. The study involved 574 women of child bearing age in three selected states (Anambra, Abia and Enugu) in the region.

Results: awareness of PID information was inadequate regardless of the sources of information (i.e., traditional and or the new media). Crucial predictor factors of exposure to PID information and PID preventive practices are demographically linked. For instance being young, uneducated and single was associated with lesser likelihood of being aware of PID information. Similar predictors impacted on preventive practices regarding PID. Findings showed that there was a strong, positive correlation between the two variables (r=.95, n=574, p<.05), with high levels of knowledge of the importance of health information on PID associated with high level of adoption of preventive practices of PID. Finally, cost of data subscription, the low capacity of information appliance to access information, the role of anxiety in health information and epileptic power supply that impedes the powering of information appliances accounted for the women's inability to access health information about PID.

Conclusions: It is the conclusion of the study that awareness of health communication interventions in Southeast Nigeria is very low and requires deliberate efforts to raise awareness and encourage women of child bearing age to take responsibility. Crucial predictor factors of exposure to PID information and PID preventive practices are demographically linked.

Keywords: Pelvic Inflammatory Disease, sexually transmitted diseases, interventions, women of child bearing age, Influence.

Introduction

Pelvic inflammatory disease (PID) refers to a clinical syndrome of the female reproductive tract (Paavonen *et al.*, 2008). The disease, which is most often related to a sexually transmitted infections (STIs) affect the uterus, fallopian tubes and ovaries. Sexually active women in their child bearing years and women between the ages of 15 and 25 years have higher susceptibility to the disease. Although there is no actual global data explaining the incidence and prevalence of PID (Medspace, 2019; Price *et al.*, 2016), national statistics from different countries point to the pervasiveness of the disease. For example, in the U.S, the National and Nutrition Examination Survey 2013-2014, reported that the prevalence of a self-reported lifetime PID diagnosis was 4.4% (i.e., 2.5 million prevalent cases) among sexually active women in their child bearing years (i.e., women 18-44 years) (Kreisel, 2017). In Australia (Victoria, New South Wales and Queensland), the rate of admission for patients who were diagnosed with PID in 2014 was 63.3 per 100 000 women (Goller *et al.*, 2018). In the United Kingdom, PID accounted for 2% of the annual visits to general practitioners (Evans *et al.*, 2008). The prevalence of acute PID was reported to be 5.2%, 16.5% and 17.2% in rural regions of South India, Bombay and Calcutta respectively (Bhatia & Cleland, 1995). In sub-Saharan Africa, PID contributes between 17% and 40% of gynecological admissions (Ross & Ison, 2006).

There are indications that when left untreated, PID could result in several complications which might include ectopic pregnancy, infertility, chronic pelvic pain and tubo-ovarian abscess. General preventive measures include practicing safe sex and abstinence. Other educational efforts have also focused on teaching patients to always get tested along with their partners and recommending that women do not douche. The potentials of these measures to address STIs including PID have been highlighted in literature. Recent findings have indicated that media campaigns, advocacies and other educational efforts can affect STIs related behaviour positively as various evidences have suggested that higher exposure to these campaigns is related to better behaviour change (Friedman *et al.*, 2016). More important is the role that individuals play in collecting and analyzing information about such STIs as PID. Media effects studies on knowledge, attitude and behaviours about STIs as well evidence on STI information sourcing abound (Gabarron & Wynn, 2016; Gilliam *et al.*, 2014; Nobles *et al.*, 2019). However, studies focusing specifically on the impact of media and other sources on knowledge, perception and behaviour about PID and what women think and do when they are accessing PID information are scanty. It is our belief that by investigating these variables, stakeholders in the fields of sexual health and communication studies might begin understand how to enrich PID information sources for women. Furthermore, the outcomes of this inquiry might provide evidence based framework that could improve young women's behaviours as far as PID is concerned. As result, this study investigated the impact of media and other sources on knowledge, perception and behaviour about PID and what women think and do when they are accessing information about PID.

Context

It is estimated that PID affects millions of women yearly all over the world and it is witnessing an uptick in Nigeria especially among young women (Obokoh, 2019). In Port-Harcourt, Rivers state Nigeria, the rate of PID was put at 11.0% (Kennedy *et al.*, 2012). In Osogbo, a south-western Nigerian state, the prevalence of PID was 70.0% (Olowe *et al.*, 2012). Also, in Nguru, North-eastern Nigeria, the rate of PID was put at 62.8% (Okon *et al.*, 2008). Findings from a study conducted by Eze *et al.* (2018) have confirmed the existence of PID among women of child bearing age in Onitsha north; particularly in Anambra state, eastern Nigeria, with high prevalence of 60 %. Even though there is paucity of data on PID in Nigeria, available literature on the prevalence of PID across Nigerian states and regions implies that the obvious evidence my not capture the actual reality pertaining the problem in the country.

Therefore, in preventing PID, it is important that women are equipped with the knowledge and the necessary skill-sets as well as interventions and advocacy (Howells & Okwudili, 2018). In addition,

prevention of complications from PID solely depends on early detection and treatment (Howells & Okwudili, 2018). As a result, taking advantage of the array of information about STIs which are prevalent in the media (both traditional – film shows, TV, radio, bill boards, etc and social media), in the hospitals, health education sessions, information education and communication (IEC) materials, from friends (peer counseling) among several other sources could have enormous public health implications on prevention efforts.

This study is particularly focused on the PID issues among women in the southeastern part of Nigeria. So far, there are several mass media campaigns aimed at preventing STIs in this region. The use of T.V, radio, Internet, print media and other advocacy programmes to disseminate information about STIs including PID have particularly been noted. For instance, there are a number local radio stations across the region (e.g., Flo FM in Abia state, Solid FM in Enugu state, etc.) known to be raising awareness and educating the public about PID and other STIs. Also in 2018, a health education and promotion initiative for STI prevention was held in southeast Nigeria. The exercise which engaged more than 70,000 women was organized by the Assemblies of God's Mission. One of the main sexual issues discussed was on PID prevention (K. Obioha, personal communication, July 20, 2020). There are indications that more of these campaigns have at one time or the other targeted women of this geographical extraction. Despite these efforts, evidence on women's preventive practices as well as their access to information about PID in the region is scanty. Equally, little is known about the perceived challenges to accessing health information on PID as well as how access to such information might impact on their preventive behaviours.

In the case of PID, there is no evidence to suggest that health communication interventions exclusively focus on the disease in Nigeria. Exiting health communication programmes are generally targeted towards STIs and related conditions like HIV/AIDS, HPV, gonorrhea, Chlamydia, PID, etc. It is therefore important to understand what women know about PID from the array of STIs information available to them. It also crucial to understand their sources of information about PID as well as how the information they get, shape their perception and behaviour about PID. To achieve this research goal, the study investigated the association between the available STIs information, particularly that of PID and women's knowledge, perception and behaviour about PID in South-Eastern Nigeria.

Literature Review

Knowledge and Awareness of health messages about PID and other STIs

There are suggestions that awareness of health information concerning PID is low. This is most likely due to the exclusive frequent media attention given to STIs and related conditions like HIV/AIDS, etc. Nonetheless, studies assessing the knowledge and awareness of women about STIs within various contexts exist. Hossain *et al.* (2014) determined the link between different socio-economic and demographic variables and knowledge and awareness about STDs among women in Bangladesh. Findings showed a significant association between geographic division (Dhaka: OR = 1.669, 95% CI = 0.89-2.10, Khulna: OR = 2.234, 95% CI = 1.2-3.2); places of residence (Rural: OR = 0.363, 95% CI = 0.20-1.08), respondent's age (20-29 years: OR = 1.331; 95% CI = 0.98-2.31); education (Primary: OR = 2.366, 95% CI = 1.98-3.1, secondary: OR = 10.089, 95% CI = 8.98-12.77, higher: OR = 20.241, 95% CI = 18.33-22.65); listening to radio (OR = 1.189, 95% CI = 1.29-3.12) and watching TV (OR = 2.498, 95% CI = 2.22-4.09) with knowledge and awareness among women in Bangladesh about STDs. Rajina *et al.* (2017) assessed the knowledge regarding PID among women admitted in Government Hospital at Kumbakonam. The authors revealed that knowledge of PID was inadequate. Findings also showed that the mass media and the health professionals were sources of information for PID among women. Pacheco (2012) also investigated knowledge, diagnosing and reporting of PID among 486 physicians in a Hawaiian hospital. Result revealed that PID was not being reported because women were not aware of the disease. Awareness of Chlamydia was also found to be low among women in clinics across Aberdeen and

Leeds in the UK (McMillan *et al.*, 1999). In addition, improved knowledge of Chlamydia was found in women above the age 25 years, in those cohabiting, in those having professional/management jobs and in those attending family planning clinic (McMillan *et al.,* 1999). So far, these studies highlighted have emphasized the significance of young women's characteristics (i.e., age, educational levels, geographical areas, information sources, etc) in understanding their knowledge and awareness of STIs. However, although many of the available studies are focused on knowledge of STIs in general with, there are limited researches exclusively investigating the knowledge of PID among women. In addition, indigenous empirical knowledge on young women's awareness of health messages targeting PID is scanty. As a result we hypothesized that:

H_0: Age, state of residence, education, marital status and the number of children of women will not predict their awareness of health messages targeting PID in southeast Nigeria

H_1: Age, state of residence, education, marital status and the number of children of women will predict their awareness of health messages targeting PID in southeast Nigeria.

In addition, the following research question was posed:

1. What is the source of health information about PID in southeast Nigeria?

Perception and Behaviour about PID and other STIs health information

The media has been lauded for shaping public perception of STIs. Other sources of health information such as health professionals, peer educators, etc. equally play specific roles in defining how people see STIs. For example, the level of exposure to health information or knowledge about a particular STI could determine the level of their vulnerability to the disease. Blackstock *et al.* (2015) found that participants in their study expressed the perception that members of their community were at a very high risk of contracting HIV/STI. Blackstock *et al.* (2015) also reported that access to health information about HIV/STI impacted on risk perception of the diseases. Sychareun et al. (2013) equally discovered that while knowledge and sources of STIs were low and few respectively, majority of the respondents who are sexually active had negative perception of STIs. More specifically, more than half (57.6%) believed that they have no risk of contracting STIs. The study also found that such variables as gender and level of knowledge about STIs information were associated with risk perception of getting STIs.

Behaviour towards PID and other STIs information are often presented within the framework of prevention and treatment practices or other personal and collective efforts. Studies have highlighted how individuals react to STIs information based on a number of factors. As an example, in an examination of the perception, attitude and practice of Jamaican women towards pelvic examination issues, Bourne *et al.* (2010) found that older women were more likely to have done pelvic examination compared to their younger counterparts. Equally, age, number of pregnancies that resulted in miscarriages, number of pregnancies that resulted in induced abortion, age of first sexual intercourse and socio-economic variables influenced pelvic examination practices. Ness *et al.'s* (2004) analysis of PID Evaluation and Clinical Health cohort suggested that persistent condom use lowered the risk of recurrent PID, chronic pelvic pain and infertility. Oluwole *et al.*'s (2020) assessment of knowledge, attitude and prevention practices of STIs among young unmarried persons in a local government in Lagos state, Nigeria, revealed that even though respondents were aware and developed good perception of STIs, their preventive practices of STIs were grossly inadequate. Majority of the information they got about STIs were obtained from Internet, teachers and schools and electronic media. Owing to the literature reviewed so far, it is evident that despite the availability of health information about STIs in various communication sources, perception and adoption of preventive practices could either be improved or discouraged. This is why it is imperative to underlie what individual' characteristics and or other factors influence how respondents perceive and act upon

STIs information that is available in various communication sources within their environment. As a result, the following hypotheses and question were raised:

H_0: Perception of health messages targeting PID in southeast Nigeria will not differ across age, state of residence, education, marital status and the number of children of women.

H_1: Perception of health messages targeting PID in southeast Nigeria will differ across age, state of residence, education, marital status and the number of children of women.

H_0: Knowledge of the importance information targeting PID is not significantly related to preventive practices of PID among women in southeast Nigeria.

H_1: Knowledge of the importance of information targeting PID is significantly related to preventive practices of PID among women in southeast Nigeria.

2. What are the perceived challenges to accessing health information on PID among women in southeast Nigeria?

Theoretical Framework

We applied the health belief model (HBM) to articulate this study. The major premise of this model is that the promotion of health behaviours is based on individual's perception of the gains and benefits of health messages targeting a particular condition. The model also suggests that if messages are able to portray health conditions as severe and impactful on the vulnerability level of target audience, such messages would likely be effective (Onuora, *et al.,* 2020). The model which was developed by Hochbaum, Rosenstock and others in the 1950s continues to standout as one of the most grounded theories in the study of health behavior (Onuora, *et al.,* 2020). There are four fundamental principles of this model: perceived susceptibility/vulnerability (i.e., belief about getting a disease or condition), perceived severity (i.e., belief about the seriousness of the disease or condition), perceived benefits (i.e., belief about the potential positive aspect of a health behaviour), perceived barriers (i.e., belief about the likely negative aspect of a health behaviour), cues to action (i.e., factors needed to trigger decision making process to adopt a recommended action) and self-efficacy (i.e., an individual's belief of adopting the needed behaviour to execute the outcome). There are several empirical studies using HBM to articulate behaviour change communication with regards to STIs (e.g., Neuberger, L., & Pabian, 2019; Onuora, *et al.,* 2020; Scarinci, *et al.,* 2012). These studies have ascertained the efficacy of HBM in sexual health promotion efforts.

When situated within the context of the present study, these fundamental principles could help to inform how women that are sexually active address questions or statements after they encounter health information about PID from various communication sources. For example, "Do I have a very high chance of contracting PID?" is a question that is related to perceived vulnerability of getting PID. Also, the perception about the severity of PID may be summed as: "My fertility would be endangered if I contract PID". "Can I prevent PID by abstaining from sex or adopting condom use?" describes the benefits of adopting a PID prevention action. A statement on the potential negative aspect of PID preventive practice would read: "distance and transportation problems deter me from going to the hospital to run PID diagnosis". Statements such as: "Hearing about PID in the news makes me think about adopting PID preventive practices" and "I will go to the hospital and get tested for PID despite the problems of distance and transportation" are examples of individuals' cues to action and self efficacy construct respectively. As Onuora, *et al.* (2020) have argued that an important element of HBM, which must be under focus is that people must be exposed to information that enables them to interpret, form opinions and approve behaviours that align or in disagreement with the content of the health messages. Consequently, the HBM is adopted to help understand what women know about PID from the line up of information sources of

PID. The HBM was also employed in the study to underscore how the information women have access to, shape their perception and impact their behaviour about PID.

Method

Sample

The study was conducted in three out of the five south-eastern states of Nigeria and was approved by the Research Ethics Committee of the University of Nigeria Nsukka, Enugu, Nigeria. Verbal and written consent were obtained from each respondent after having been fully briefed on the study objectives, risks, benefits, and steps taken to ensure confidentiality. A total of 574 young women of child bearing age provided data for the study. The respondents were aged 20 and 51 years with those in the age brackets of 20 – 30 years (64.3%) and 31 – 40 years (26.5%) constituting the highest categories. Some 7.8% and 1.4% of the respondents belonged to the 41-50 and 51 years age category respectively. While more than half of the respondents (55.7%) were single, another 41.8% were married. Few of the respondents were however, divorced (0.7%), widowed (1.4%), and separated (0.3%). Although very few respondents (0.7) had more than 7 children, respondents who had between 1-3 and 4-6 represented 27.4% and 11.5% of the sample respectively. Respondents with no children constitute a majority (60.5%). Information about the educational levels of respondents suggest that majority of the women (82.0%) have tertiary education. While some 16.7% had secondary education, 0.7% had primary education. Very few respondents (0.5%) did not have any education.

Procedure

A descriptive survey was used to elicit information from selected respondents. The study involved 574 women of child bearing age in three selected states (Anambra [25.1%], Abia [36.8%] and Enugu [38.2%]) in South-eastern region of Nigeria. The high prevalence of STIs common among young women in the southeastern part of the country justified the choice of the study area. The study adopted a multistage sampling approach. At the first stage, we used a simple random sampling technique to select three states from the five states in the region. Afterwards, a purposive sampling was employed to select two urban centers in each of the states selected In Anambra, Onitsha (mix of urban and rural residents) and Akwa (the capital city) were selected. In Enugu, Nsukka (mix of urban and rural residents) and Enugu (the capital city) were selected. Finally, Umuahia (capital city) and Abiriba (mix of urban and rural residents) were selected in Abia. Streets and residential areas were selected using a simple random sampling technique in each of the centers chosen. Households were further selected by using a mixture of a systematic and simple random sampling method. Subsequently, each of the households that were selected served as the sample for the study. We also ensured that households that could not meet the inclusion criteria were replaced. These criteria include: (1) being sexually active within three months before the time of data collection (2) having access to general information from various media sources within the past three month before interview (3) showing willingness to participate and (4) reporting as a resident of any of the southeastern state.

Copies of the questionnaire were administered with the help of nine research assistants (RAs) who were recruited from three university communities in the region. A one week intensive training was undertaken to familiarize and equip the RAs with the necessary skill-set to assist in data collection. An institutional board approval was sought and given for the study.

Materials and Measures

The research questions and hypotheses developed for this study informed the items designed in the questionnaire distributed during the study. The overview comprised of two segments: (a) demographic characteristics and other key questions in that informed the study. The test re-test method was used to test reliability of the questionnaire. Twenty (20) copies were administered in two of the study areas and then re-administered after an interval of about two weeks (12 days).

Awareness of PID was measured by one item. The item was worded “Since you have been watching the TV, listening the radio, speaking to friends, etc, have you been exposed to any health

message about Pelvic Inflammatory Disease" Response options was between "Yes" and "No". Knowledge of the importance of health information about PID was measured by a 10 item 5 point Likert scale, ranging from "Strongly Agree" to "Strongly Disagree". This was designed to know how much value or potentials women see in promotional health information. For instance, one of the items was worded like this: "It is the use of communication strategies to inform and influence choices people make about their sexual health". A reliable Chronbach's alpha of .76 was obtained. Communication sources of PID messages were identified when respondents provided answers to this question: "Through which medium did you get to know about health messages on Pelvic Inflammatory Disease?" options given ranged from radio to friends and family. This was treated as a nominal variable. Furthermore, perception of health information about PID was measured by a 12 item 5 point Likert scale, ranging from "Strongly Agree" to "Strongly Disagree". As an example, some of the items were worded like this: "Health messages on PID are useful tips to prevent pelvic pains" "Health information about PID prevention is not necessary because it is a supernatural ailment". A reliable Chronbach's alpha of .90 was obtained. Again, behavioural change pattern (i.e., preventive practices) to health information about PID was measured by a 11 item, 5 point Likert scale, ranging from "Strongly Agree" to "Strongly Disagree". An example of one of the items read: "Since I knew about the dangers of having unprotected sex as it relate to PID, I insist on using condoms during sex". We obtained a reliable Cronbach's alpha (α) score of .72 for the scale. Finally, challenges to accessing health information about PID was measured by a 13 item, 5 point Likert scale, ranging from "Strongly Agree" to "Strongly Disagree". For instance, "I rarely understand some technical terms/medical jargons in the PID messages" was one of the items in the scale. A reliable Cronbach's alpha (α) score of .80 was obtained.

Analysis

Data were analysed using SPSS version 23.0. A one way analysis of variance (ANOVA) was conducted to compare the perception and preventive practices of health messages targeting PID across respondents' age, education, marital status and the number of children of women. A multiple binary logistic regression analysis was used to test for possible influences of socio-demographics of women on awareness of health messages focusing on PID. A correlation analysis was equally used to ascertain the relationship between knowledge of health information about PID and preventive practices of PID among women in the sample.

Result

Exposure to PID health messages and sources of health messages about PID

Finding indicates that slightly over half of the women in the sample (52.3%) had not been exposed to health information touching on the subject of PID. The remaining 47.7% had been exposed to health information about PID. This outcome is suggestive of the fact that knowledge of PID information is low among respondents. As to the sources of information about PID, Findings revealed that the radio (30.7%) constitute the most common source of information about the condition. Other sources of information related to PID identified by respondents were Newspapers (18.8%), health workers (12.2%), TV (9.2%), Magazines (8.9%), family and friends (7.7%), social media (7.5%) and billboards/tracts and pamphlets or PID campaigns and educational efforts (5.1%).

H_1: Age, state of residence, education, marital status and the number of children of women will predict their awareness of health messages targeting PID in southeast Nigeria.

Table 1. Binary logistic regression analysis for possible influences of Age, state of residence, education, marital status and the number of children of women on their awareness of health messages targeting PID in southeast Nigeria

			95% C.I.	
		OR	Lower	Upper
Age	20-30 years			
Reference:		1		
	31-40 years	1.201*	1.144	2.933
	41-52 years	2.197**	1.244	2.906
State of residence	Anambra	1		
Reference:	Abia	2.596**	1.571	4.291
	Enugu	3.916**	2.513	6.103
Highest Level of Education	No Formal Education	1		
Reference:	Primary	0.711	1.112	2.312
	Secondary	3.821**	1.844	4.132
	Tertiary	4.128**	1.892	3.141
Marital status	Separated	1		
Reference:	Married	2.052*	1.178	2.547
	Divorced	0.757	0.041	3.935
	Widowed	0.275	0.007	8.592
	Single	0.468	1.322	4.211
Number of Children	1-3	1		
Reference:	4-6	0.722	0.383	1.363
	7 and above	0.612	0.282	1.325
	None	1.351*	1.134	3.651

* P < .01. ** P $\leq$ .001.

To understand the influence of respondents' demographic characteristics, binary logistic regression was the statistical tool used. As described in Table 1, the odd of being exposed to health information about PID was the highest in older respondents (*OR* 2.19, 95% CI 1.244-2.91, *p*=.000) followed by young adults (*OR* 1.20, 95% CI 1.14-2.93, *p*=.000). Women resident in Enugu (*OR* 2.60, 95% CI 1.57-4.29, *p*=.000) and Abia (*OR* 3.92, 95% CI 1.57-4.29, *p*=.000) had a higher likelihood of being exposed to STI information about PID compared to those in the referent group (Anambra state). In addition, respondents who reported having secondary education (*OR* 3.82, 95% CI 1.84-4.13, *p*=.001) and tertiary education (*OR* 4.13, 95% CI 1.89-3.14, *p*=.000) had higher chances of being exposed to health information containing PID issues than those with primary or no education. Only respondents who were married (*OR* 2.05, 95% CI 1.18-2.55, *p*=.01) had a higher chance of coming into contact with health information about PID compared to other covariates. Respondents who reported not having any child (*OR* 1.35, 95% CI 1.13-3.65, *p*=.01) had a higher odd of being exposed to health information containing PID issues compared to other covariates.

H_1: Perception of health messages targeting PID in southeast Nigeria will differ across age, state of residence, education, marital status and the number of children of women.

A series of one-way between-groups analysis of variance was performed to ascertain whether the perception of health messages targeting PID in southeast Nigeria will differ across age, state of residence, educational levels, education, marital status, and the number of children the women had or did not have. First, findings showed that there was a statistically significant difference in the perception of health messages across the 3 states [*F*=(2, 568)=8.8, p=.000]. Even though results reached statistical significance, the actual difference between the means scores was small with an effect size of .003. Post-hoc comparison using the Tukey HSD test showed that the mean score for respondents in Anambra state (*M*=30.2, *SD*=12.55) was significantly different from those in Abia (*M*=36.25, *SD*=10.39) and Enugu

(*M*=37.87, *SD*=8.43). However, there was no significant difference in mean scores between respondents in Abia and Enugu states. Findings on the observed differences in the perception of health messages between age groups showed that result did not reach statistical significance [*F*=(3, 567)=0.90, *p*=.443]. However, a statistical significant difference was observed in the perception of health messages across marital status [*F*=(4, 570)=4.33, *p*=.002]. The actual difference between the mean scores was small (.003). Except for respondents who were single (*M*=29.53, *SD*=12.70), there was no significant difference between those who were married (*M*=39.50, *SD*=7.39), divorced (*M*=41.50, *SD*=5.06), widowed (*M*=41.00, *SD*=10.94) and separated (*M*=36.00, *SD*=7.07). Results also revealed that there was a significant difference in the perception of health messages across groups of respondents with different number of children [*F*=(3, 567)=6.55, *p*=.000]. The difference between the means scores was small with an effect size of .03. Post-hoc test showed that a significant difference was found between respondents who had no children (*M*=30.65, *SD*=10.47) and those with 1-3 children (*M*=40.01, *SD*=7.07). There was no mean difference in scores of women who have had from 4-6 (*M*=39.53, *SD*=8.85) and 7 and above (*M*=32.75, *SD*=7.63) children or 1-3 and 4-6 children. In addition, findings on the observed differences in the perception of health messages between educational categories showed that result did not reach statistical significance [*F*=(5, 565)=1.89, *p*=.094].

H_1: Knowledge of the importance of information targeting PID is significantly related to preventive practices of PID among women in southeast Nigeria.

Correlation analysis was conducted to address the hypothesis above. Preliminary analyses were performed to ensure no violation of the assumption of normality, linearity, and homoscedasticity. Findings showed that there was a strong, positive correlation between the two variables (*r*=.95, *n*=574, p<.05), with high levels of knowledge of the importance of health information on PID associated with high level of adoption of preventive practices of PID.

Perceived challenges to accessing health information on PID among women in southeast Nigeria

Findings indicating the perceived challenges to accessing health information about PID are presented in Figure 1. According to the result, cost of data subscription, the low capacity of information appliance to access information, the role of anxiety in health information and epileptic power supply that impedes the powering of information appliances accounted for their inability to access health information about PID. Respondents could not ascertain whether cost of health magazines and other products containing PID issues, and lack of external cues such as billboards showing PID information are obstacles to accessing PID information.

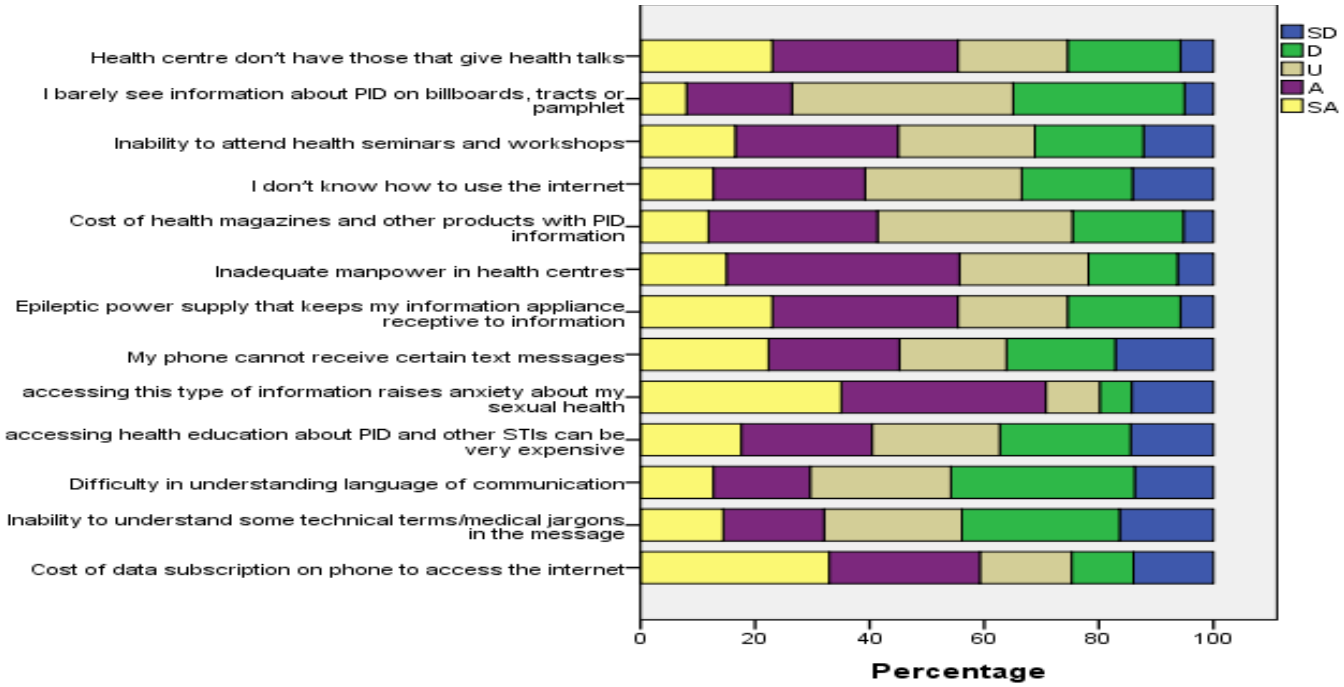

Figure 1. *perceived challenges to accessing health information on PID among women in southeast Nigeria*

Discussion

The study investigated the association between the available STIs information, particularly that of PID and women's knowledge, perception and behaviour about PID in South-Eastern Nigeria. The study finds that awareness of PID information was low among women. Previous studies (e.g., Kassie *et al.*, 2019; McMillan *et al.*, 1999; Pacheco, 2012; Rajina *et al.*, 2017) have reported similar outcome where knowledge of PID or related STIs were found to be inadequate. The radio was the commonest source of health information about PID in the study. This is not surprising since it (the radio) is appears to be a common avenue where many health promotion programmes are aired within the region under study. Our first hypothesis of the study that age, state of residence, education, marital status and the number of children of women will predict their awareness of health messages targeting PID was confirmed. Older respondents, those residing in Enugu and Abia, those with tertiary and secondary educational qualification, those who were married and those who reported having no child were more likely to be aware of health information about PID. This outcome is in agreement with related studies (e.g., Bolarinwa, 2019; Hossain *et al.*, 2014; Luba et al., 2019) suggesting that there is an association between socio-economic and socio-demographic variables and awareness of different STIs especially HIV/AIDS. For example, in their study of the knowledge, attitude and associated factors towards TB in Lesotho, Luba *et al*. (2019) found that being a farmer, a male, young, illiterate, and residing in rural areas increased the likelihood of not being aware of TB. In the case of our study, women who were younger, residing in Anambra, less educated (having less than a secondary education), unmarried and with children were less likely to get information about PID. These findings highlight the importance of focusing on demographic characteristics with deficiencies in accessing PID health information in the formulation of policy framework that aim to prevent PID and other STIs among women. For example, by targeting women who are younger and or uneducated, health communication and promotion efforts to prevent PID might become more effective in the area.

Although there were no differences in the perception of health messages targeting PID across age and educational categories of respondents, the hypothesis stating that differences would be found in the

other categories was confirmed. Differences were observed in respondents' state of residence; marital status, and the number of children they had or did not have. For example, those who did not have children had the lowest perception scores. Also, respondents who were single had the lowest mean scores and were significantly different from other categories. This is therefore an indication that this group of respondents (i.e., those single) had misperceptions about PID information gotten from various sources. Related studies showing unmarried (i.e., single) individuals being at risk of STI abound (e.g., Rosmala-Nur *et al.,* 2020; Vyas, 2017). The outcome from the present study adds to this evidence by showing that there is an association between being unmarried and some of the misperceptions held about such STI as PID. One of the misperception for instance is the notion that information about PID is needless because the disease might be supernatural. Similar misconception was reported in a previous study (i.e., Nuwaha *et al.,* 1999). Such views have enormous implication for communication strategies for the prevention of PID in the study area. Therefore by correcting what women already believe through a robust health education framework emphasizing PID prevention and testing as well as directing attention to vulnerable groups (e.g., unmarried, those without a child), we might start to address these misperceptions.

The third hypothesis stating that knowledge of the importance of information targeting PID is significantly related to preventive practices of PID among women in southeast Nigeria is confirmed as our correlation analysis suggesting that high levels of knowledge of the importance of health information on PID was associated with high level of adoption of preventive practices against the disease. This outcome is not only related to previous studies on knowledge and preventive practices of STIs (e.g., Edith & Ovaioza, 2013; Kassie *et al.,* 2020; Makwe & Adenyuma, 2014; Oluwole *et al.,* 2020), but also extends knowledge on how specific preventive practices against PID might be associated with how much women know about the disease. This also points to the fact that efforts geared towards improving preventive practices against PID must also expand focus on increasing awareness and giving out facts about PID to women. We had noted in the introductory part of this study, efforts in the aspect of health communication intervention for PID and other STIs in the southeastern part of Nigeria. We are therefore of the view that these efforts should be redoubled so as to increase the likelihood of exposure to PID information. When more work is put into the process of creating awareness and improving the knowledge of women of reproductive age about PID, it is expected that their attitude and behaviour would be significantly improved. To achieve this, common health information sources (i.e., radio, etc.) must be leveraged consistently.

Finally, our findings highlight that the perceived challenges to accessing health information about PID include cost of data subscription, the low capacity of information appliance to access information (i.e., lack of a smart phone or technology to access information online), the role of anxiety in health information and epileptic power supply. These challenges which appear to be technologically related are mostly about the lack of access to the new media technologies. This is not surprising since the radio and the more traditional media channels were utilized for PID information by the study respondents. Also, these problems tend to serves as a reflection of some of the technological challenges to general information access in Nigeria. For example, in their study of nurses' perception of barriers to use of ICT in a Teaching Hospital in Nigeria, Irinoye et al. (2013) found that technology related problems (e.g., unreliable network connections, poor Internet access, poor system designs, etc.) impacted on information access. As a result, health communication interventions should consider improving the conditions for which these technologies must function. For example, we believe that by making data subscription costs more affordable for the low income class (i.e., majority of who are women), information about PID and other STIs might be easily accessed by many women in the southeast region.

The role of anxiety and fear in sourcing or taking advantages of the PID communication channels available was an important finding in the study. Studies like that of Baumgartner and Hartmann (2011) had highlighted the role of fear and anxiety in online information search in an online experiment. In our study, these variables could be experienced across other media channels as it may not be restricted to the online environment alone. This again shows how crucial anxiety could serve as influence on general PID information seeking in our sample. Health communication intervention efforts could redesign their health education and advocacy framework on PID prevention to include allying the fears of women of

reproductive ages in the region about the need to appreciate the benefits of early detection. Altogether, some of the findings of the present study have some theoretical implications. The outcomes indicating the perceived challenges to accessing information on PID are revalidation for some of the basic constructs of this theory. For example, the challenges of cost of data subscription (perceived benefits) were associated with PID information seeking. Also, availability of PID information on billboards, tracts, pamphlets, etc. (cues to action) also served as a perceived motivation for PID information seeking behaviour. These basic constructs therefore needs to be taken into consideration if the right information about PID must be developed.

Conclusion

It is the conclusion of the study that awareness of health communication interventions in Southeast Nigeria is very low and requires deliberate efforts to raise awareness and encourage women of child bearing age to take responsibility. Crucial predictor factors of exposure to PID information and PID preventive practices are demographically linked. The knowledge of how crucial PID information is also determines PID preventive practices among women of reproductive age in the study. PID as a public health issue needs strategic approach from all the concerned health stakeholders. Health communication interventions could serve as an effective approach sufficient enough to tackle the condition among reproductive women. Greater efforts should therefore be made to improve the quality of information and expand the methods of information on PID. While more of the traditional means of communicating PID information should be engaged, extending the frontiers of the new media is imperative. Because obstacles in the way of effective dissemination of PID information are obvious, it is important that these deficiencies are methodically addressed to improve the targeted women's access to PID information.

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