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Prevalence of *Helicobacter pylori* in Pregnant women attending a Tertiary Health Facility in Port Harcourt, Nigeria

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ABSTRACT: This study was carried out to detect anti-*Helicobacter pylori* antibodies in pregnant women in Port Harcourt, Nigeria. Blood samples were collected from 100 pregnant women and processed using standard laboratory procedures. One Step Anti- HP Rapid test kit was used stepwise to detect *H. pylori* antibodies in the blood samples. Commercial ELISA by Dia Pro (Italy) was also used to assay the presence of *H. pylori* IgG and IgM antibodies among these subjects. Results showed that the overall prevalence of *H. pylori* was 20.0% for pregnant women. The age ranges of the participants were from 20-67 years. Among these pregnant women, a higher prevalence of *H. pylori* was observed among the age group 20-29 years (28.0%), married (20.2%), secondary education (41.2%), artisans (50.0%), no religion (22.2%), monogamous family type (21.4%), second trimesters (30.0%), multiparous pregnant women (3-4 pregnancies, 33.3%), no history of abortion (22.7%), history of STDs (28.6%) and HIV seropositive status (42.9%). Of all the variables tested, only educational status (P = 0.04) and gestational periods (P = 0.03) were significantly associated (P < 0.05) with *H. pylori* infection. This study has shown that the prevalence of *H. pylori* infection is high among pregnant women in Port Harcourt, Nigeria. Among socio-demographic variables studied, only family type and HIV seropositive status were strongly associated with an increased risk of *H. pylori* infection. The study has shown that *H. pylori* infection is common and constitutes a significant public health challenge in Port Harcourt, Nigeria. Further studies among pregnant women in the state are highly advocated.
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1. Introduction

Helicobacter pylori is an intestinal gram-negative, helical, microaerophilic bacterium (Obleaga et al., 2016). *Helicobacter pylori* (HP), a gram-negative micro-aerophilic rod-spiral flagellated bacterium that can produce an abundance of urease, has been linked to several upper gastrointestinal conditions that manifest as dyspepsia (Suerbaum & Michetti, 2002; Oluwasola et al., 2002; Jemilohun et al., 2010). Although the duodenum also contains it, the stomach mucosa is its natural habitat (Adeniyi et al., 2012). The organism, which has two to six flagella and is classified as a class one carcinogen, has chronically infected more than half of the world's population (Dube et al., 2009). Infection with *Helicobacter pylori* is believed to affect 50.0% of the world's population. The World Health Organization (WHO) has classified the organism as a group I carcinogen, making it a pathogen of concern (Obleaga et al., 2016; Mladenova, 2021). Gastric mucosa-associated lymphoid tissue (MALT) lymphoma, gastric adenocarcinoma, gastritis, and peptic ulcer disease (PUD) have all been linked to *Helicobacter pylori* (Sabbagh et al., 2019). With an estimated 87.7% prevalence rate, *H. pylori* are very common in Nigeria (Smith et al., 2022a). Only a small percentage of infected people eventually acquire PUD or gastric cancers; the majority of infected people (>80%) have asymptomatic chronic gastritis (Smith et al., 2019a).

The necessity for an effective initial diagnosis, therapy, or monitoring of the eradication process is appropriate given the high incidence of *H. pylori* in Nigeria (Smith et al., 2019a, 2022a; Bordin et al., 2021). Numerous diagnostic techniques for *H. pylori* can be broadly divided into invasive and non-invasive tests (Malfertheiner et al., 2007; Jemilohun et al., 2010). Endoscopic biopsy samples are used in invasive tests for a polymerase chain reaction, rapid urease test (RUT), histopathology, and culture. The sensitivity and specificity of these tests are substantially above 90%. (Graham & Sung, 2006). There is no need for endoscopy with non-invasive examinations. Urea breath test (UBT), immunoglobulin G and M serology, stool antigen test, saliva antibody test, and urinary antibody test

are some of these (Malfertheiner et al., 2007; Jemilohun et al., 2010), except for Immunoglobulin G (IgG) serology, non-invasive diagnostics are not frequently accessible in Nigeria.

The utility of serological testing in a hyper-endemic area like Nigeria is restricted because of their low discriminatory ability between previous and present infection. High sensitivity and molecular specificity procedures are other *H. pylori* diagnostic methods (Smith et al., 2022b). Several healthcare facilities and settings in Nigeria have used the aforementioned diagnostic techniques to identify *H. pylori* (Smith et al., 2022a). For epidemiological investigations on *H. pylori* infection, serology in the diagnosis of *H. pylori* is helpful, although being viewed as inferior to the monoclonal Stool Antigen Test (SAT) and urea breath test (UBT) (Smith et al., 2022a). Since it cannot distinguish between current and previous infections, it cannot be applied to subsequent research like antimicrobial susceptibility testing (Abadi, 2018; Makristathis et al., 2019). Serology has been used in several investigations in Nigeria to identify *H. pylori* infection in both humans and animals (Smith et al., 2022a).

The most common aetiology of chronic gastritis and peptic ulcers in the general population is infected with *Helicobacter pylori*. According to some studies, interactions between the immune/inflammatory response, gastric physiology, and host repair mechanisms significantly determine the disease outcome following *H. pylori* infection, suggesting that the host's immune competence may be a critical factor in *H. pylori* infection. Gastric erosion and ulcers were discovered in 43.6% and 15.4% of Nigerian patients in the study by Palamides et al. (2020), as opposed to 4.0% and 9.3% of South African patients, respectively. Also, 2.6% of Nigerian patients in the same study were found to have stomach cancer brought on by *H. pylori* infection (Smith et al., 2022b). Beyond the high frequency of *H. pylori* infection and its related clinical effects, the pathogen's ability to be effectively treated and eradicated in Nigeria is gravely endangered by its high levels of growing antibiotic resistance (Jolaiya et al., 2020; Smith et al., 2022a). To the best of our knowledge, there is not much research comparing *H. pylori* among pregnant women, particularly in Nigeria. This investigation was started to determine whether pregnant women in Port Harcourt, Rivers State, Nigeria, have *H. pylori* antibodies.

MATERIALS AND METHODS

2.1 Study Area

The study was conducted with pregnant women at the University of Port Harcourt Teaching Hospital (UPTH), Port Harcourt, Rivers State, South-South of Nigeria. The hospital serves as a referral centre for a substantial part of the South-South region of Nigeria. The study was conducted from February 2019 to November 2019 in Port Harcourt, Rivers State, Nigeria and was limited to pregnant women in the University of Port Harcourt Teaching Hospital (UPTH). The hospital serves as a referral centre for a substantial part of the South-South region of Nigeria. The occurrence of *Helicobacter pylori* among pregnant women was investigated using ELISA and one step rapid strip test. The influence of the patient's age, marital status, occupation and educational status, among others, on the prevalence of *Helicobacter pylori* was also considered.

2.2 Study Population

Blood samples were collected from 100 pregnant women patronizing the University of Port Harcourt Teaching Hospital (UPTH) antenatal clinic located at Port Harcourt, Rivers State, Nigeria. Blood samples were collected randomly from patients and carried to the Virus Research Unit, Department of Microbiology, University of Port Harcourt, Nigeria, for serological analysis.

2.3 Serological Analysis of anti-*Helicobacter pylori*

Rapid screen cassette and commercially available ELISA kit for anti-*Helicobacter pylori* manufactured by Dia Pro, Italy. The test was performed according to the instruction of the kit's manufacturers. A parallel test was carried out for the Helicobacter pylori antibody using One Step ANTI-FTP.

2.4. Data Analysis

Data were analyzed using the Statistical Package for Social Sciences (SPSS) version 11.5. The seroprevalence for *H. pylori* was expressed as a percentage for the entire study group.

3. RESULTS

3.1 Overall Prevalence of *Helicobacter pylori*

Twenty per cent (20.0%) of the pregnant women were positive for *Helicobacter pylori*, while 80.0% were seronegative (Table 1).

3.2 Prevalence of *Helicobacter pylori* with the socio-demographic characteristics of the Pregnant women

Among the pregnant women tested for *Helicobacter pylori*, 20.0% tested positive. Of all the variables tested, only educational status ($P = 0.04$) and gestational periods ($P = 0.03$) were significantly associated ($P < 0.05$) with *H. pylori* infection (Table 1).

3.3 Age-Specific Prevalence of *Helicobacter pylori* in Pregnant women

Among the cohorts of pregnant women, a higher prevalence of *Helicobacter pylori* occurred in the age group 20-29 years (28.0%) compared to ages 30-39 years with 18.8% prevalence rate of *Helicobacter pylori* and other age groups with zero prevalence rates of

Helicobacter pylori as shown in Table 1. Statistically, age (p = 0.28) was not significantly associated with the prevalence of *H. pylori* in pregnant women (Table 1).

3.4 Marital Status- Specific Prevalence of *Helicobacter pylori* in Pregnant women

H*elicobacter pylori* were more prevalent among married pregnant women (20.2%) than singles (0.0%). Statistically, marital status (p = 0.62) was not significantly associated with the prevalence of *H. pylori* in pregnant women (Table 1).

3.5 Educational Background-Specific Prevalence of *Helicobacter pylori*

A higher prevalence of *Helicobacter pylori* was observed among pregnant women with secondary education (41.2%) compared to those with tertiary education (16.3%) and primary/no formal education with zero prevalence rates, as shown in Table 1. However, the level of education (p = 0.04) had a significant relationship with the prevalence of *Helicobacter pylori* in pregnant women (Table 1).

3.6 Occupation-Specific Prevalence of *Helicobacter pylori* in Pregnant women

Among the cohorts of pregnant women, a higher prevalence of *Helicobacter pylori* was found among artisans (50.0%) compared to other occupational groups with various prevalence rates. This was followed by students (44.4%), traders (25.7%), business executives (14.3%), civil servants (9.1%), and unemployed (8.3%). Statistically, there was no significant relationship between occupation (p = 0.08) and the prevalence of *Helicobacter pylori* in pregnant women (Table 1).

3.7 Religion-Specific Prevalence of *Helicobacter pylori* in Pregnant women

A higher prevalence of *Helicobacter pylori* was observed among pregnant women with no religion (22.2%) than those who were Christian (19.8%) and Muslim (0.0%), as highlighted in Table 1. However, no significant association was found between religion (p = 0.86) and the prevalence of *Helicobacter pylori* in pregnant women (Table 1).

3.8 Family Types-Specific Prevalence of *Helicobacter pylori* in Pregnant women

A higher prevalence of *Helicobacter pylori* was observed among pregnant women with the monogamous family type (21.4%) than those with the polygamous family type (12.5%), as shown in Table 1. However, no significant association was found between the family type (p = 0.41) and the prevalence of *Helicobacter pylori* in pregnant women (Table 1).

3.9 Gestational Period-Specific Prevalence of *Helicobacter pylori* in Pregnant women

A higher prevalence of *Helicobacter pylori* occurred in pregnant women in their second trimesters (30.0%) than in their third trimesters (12.5%) and first trimesters with zero prevalence rates, as shown in Table 1. A significant association was found between the gestation period (p = 0.03) and the prevalence of *Helicobacter pylori* occurring in pregnant women (Table 1).

3.10 Parity-Specific Prevalence of *Helicobacter pylori* in Pregnant women

A higher prevalence of *Helicobacter pylori* was found in multiparous pregnant women (3-4 pregnancies) with a prevalence rate of 33.3% than those with 1-2 parity (18.2%) and nulliparous (15.8%), as shown in Table 1. It shows that *Helicobacter pylori*'s prevalence increases with several pregnancies. No significant association existed between the parity (p = 0.28) and the prevalence of *Helicobacter pylori* in pregnant women (Table 1).

3.11 Abortion History-Specific Prevalence of *Helicobacter pylori* in Pregnant women

A higher prevalence of *Helicobacter pylori* was found in pregnant women with no history of abortion (22.7%) than those with such a history (14.7%), as shown in Table 1. No significant association was found between the history of abortion (p = 0.34) and the prevalence of *Helicobacter pylori* in pregnant women (Table 1).

3.12 History of STDs-Specific Prevalence of *Helicobacter pylori* in Pregnant women

A higher prevalence of *Helicobacter pylori* infection was found in pregnant women with a history of STDs (28.6%) than those without no (19.4%), as shown in Table 1. No significant association was found between the history of STDs (p = 0.56) and the prevalence of *Helicobacter pylori* in pregnant women (Table 1).

Table 1: Prevalence of *Helicobacter pylori* with the socio-demographic characteristics of the Pregnant women

Variables	Groups (years)	No Tested	No Positive (%)	Chi-Square Analysis
Age Groups	20-29	25	7(28.0)	P = 0.28
	30-39	69	13(18.8)	
	40-49	6	0(0.0)	
Marital Status	Married	99	20(20.2)	P = 0.62
	Single	1	0(0.0)	
Educational Status	None	1	0(0.0)	P = 0.04
	Primary	0	0(0.0)	
	Secondary	13	6(41.2)	
	Tertiary	86	14(16.3)	
Occupational Status	Student	9	4(44.4)	P = 0.08
	Unemployed	12	1(8.3)	
	Civil servants	33	3(9.1)	
	Trading	35	9(25.7)	
	Artisans	4	2(50.0)	
	Business Executive	7	1(14.3)	
Religion	Christianity	91	18(19.8)	P = 0.86
	Muslims	0	0(0.0)	
	None	9	2(22.2)	
Family Type	Monogamous	84	18(21.4)	P = 0.41
	Polygamous	16	2(12.5)	
Gestation Period	1st Trimester	9	0(0.0)	P = 0.03
	2nd Trimester	50	15(30.0)	
	3rd Trimester	41	5(12.2)	
Parity	0	38	6(15.8)	P = 0.28
	1-2	44	8(18.2)	
	3-4	18	6(33.3)	
History of Abortion	Yes	34	5(14.7)	P = 0.34
	No	66	15(22.7)	
History of STDs	Yes	7	2(28.6)	P = 0.56
	No	93	18(19.4)	
Total		**100**	**20(20.0)**	

4. DISCUSSION

Helicobacter pylori (*H. pylori*) has been well noted as a causative agent of many diseases in the gastrointestinal (GI) tract, notably gastritis, peptic ulcer disease, and gastric adenocarcinoma (Bello et al., 2018). The burden of *H. pylori* infection in Nigeria is high (87.7%), with the northern part of the country having a higher prevalence than other regions (Smith et al., 2022). Determining the burden and the risk factors for acquiring this infection may be crucial to containing it and its sequelae in Port Harcourt, Nigeria.

In the present study, of the 100 pregnant women examined, 20.0% tested positive for *Helicobacter pylori*. In corroboration, a comparable low (19.6%) prevalence of *H. pylori* infection occurred among Port Harcourt patients, according to Ayodele et al. (2018). In Uyo, Akwa Ibom State, *H. pylori* infection prevalence was low (29.7%) among internally displaced people aged 5 to 75, with female subjects between the ages of 5 and 14 having the most significant infection rates (Owowo et al., 2019). Enitan et al. (2018) investigations on Babcock University students in Ogun State, Nigeria, on the other hand, observed a comparable low prevalence rate of *H. pylori* infection (23.5%) and showed a link between infection and gender and age. However, the 20.0% reported in this study is higher than the 12.7% reported by Jemikalajah and Okogun (2014) in Warri, Nigeria, the 6.0% reported by Okosigha (2014) in Port Harcourt, Nigeria and 2.0% prevalence of HIV and *H. pylori* coinfection in Port Harcourt, Nigeria (Okonko & Barine, 2018).

The results indicated that infection in 20.0% of the study population. This is not in line with the values previously reported in Nigeria. The 20.0% reported in this study is lower than the high prevalence rates earlier reported in Nigeria and some developing countries (Lee et al., 2003). It is lower than the 38.0% reported in our earlier study in Port Harcourt, Nigeria (Ahaotu et al., 2023) and the 42.6% reported by Kooffreh-Ada et al. (2019) in Calabar, Cross River State, Nigeria. This finding disagrees with the 44.4% reported by Barine (2004) and Okonko et al. (2016) in Port Harcourt, Nigeria, the 81.7% reported by Bello et al. (2018) in Kano, Nigeria, and the 72.1% overall prevalence of *H.*

pylori infection reported by Chen et al. (2014). A study conducted at the Awka in Anambra, South-East Nigeria, a seroprevalence of 51.4% for *H. pylori* was reported (Chukwuma et al., 2020). Ibebuike et al. (2017) showed a significantly high (60.63%) and low (39.37%) prevalence of *H. pylori* infection in Aba, Abia State, South East, Nigeria. In Lagos, South-West Nigeria, Olufemi et al. (2015) found that *H. pylori* seroprevalence was high (68.7%). Nevertheless, Ajayi et al. (2021) observed a higher (80.0%) prevalence rate of *H. pylori* infection among patients in Lagos, South West, Nigeria.

This prevalence reported in this study is different from *H. pylori* prevalence rates as reported in other Nigerian studies. According to Bello et al. (2018), *H. pylori* is a common childhood infection that affects 70.0% to 90.0% of the population in underdeveloped nations, while the prevalence is lower in industrialized nations, ranging from 30.0% to 40.0% (Saad & Chey, 2008). Also, 81.0% frequency was reported in a previous study from the same institution in 2009 by Bashir and Ali (2009). *H. pylori* prevalence was 77.1% in another study from Gombe (Mustapha et al., 2011), whilst Ndububa et al. (2001) in Ile-Ife showed prevalence rates of 73.0%. The prevalence rates in Nigeria are comparable to those seen in research from South Africa (Kidd et al., 1999) and Kenya (Kimang'a et al., 2010), which found 66.0% and 94.0%, respectively, respectively. Malu et al. (2000) in Jos found a prevalence of 87.0%, while Aboderin et al. (2007) reported 73.0% in the South-West. Studies from many African countries reported similar prevalence rates of 91.7% in Egypt (El Dine et al., 2008), 97.0% in Gambia (Secka et al., 2011), and 75.4% in Ghana (Baako & Darko, 2009). Similarly, in Asia, prevalence rates of 92.0% have been reported in Bangladesh (Ahmad et al., 1997), and 62.0% prevalence was found in Chinese (Shi et al., 2008). In a study conducted in Glasgow, UK, Woodward et al. (2000) reported a prevalence of 66.0%, noting that this prevalence was more typical in developing nations. They concluded that the high level of social deprivation in Glasgow at the time was the reason for the high prevalence of *H. pylori* in the study.

A nonstatistically associated (p=0.28) age-specific prevalence was reported. In contrast, Okosigha (2014) in Port Harcourt, Nigeria, reported an age-specific prevalence of *H. pylori* infection in their study but went on to say that children (ages 1–18) had a low prevalence rate of the infection compared to adults (ages 19–37). Our study found that the prevalence of *Helicobacter pylori* was higher in the age group of 20–29 years (28.0%) than in the age group of 30-39 years (18.8%) and that it was absent in all other age categories. This observation also conflicts with the findings of the report by Joav et al. (2004), which discovered a comparable circumstance. Compared to other age groups, 30-39-year-olds had the most significant rate of *H. pylori* infection, according to Zhu et al. (2014). Kooffreh-Ada et al. (2019) study revealed a high prevalence rate of *H. pylori* infection between the ages of 40 to 60 years in Calabar, Cross River State, Nigeria.

In general, married people had a greater prevalence of *Helicobacter pylori* than single participants. According to statistics, the prevalence of *H. pylori* was not significantly correlated (p=0.62) with marital status. Marital status and *H. pylori* infection were linked, according to Chen et al. (2014). According to Brenner et al. (1999), a person's time living with an infected spouse increased their likelihood of contracting *H. pylori* infection. According to Marshall (2006), a patient who married into a family with gastric ulcers later experienced duodenal ulceration. According to Chen et al. (2014), the marital transmission of *H. pylori* to a partner who does not have the disease may also be a way for it to spread later in life.

The participants' education level had significant relationship (p=0.04) with the prevalence of *Helicobacter pylori*. Among the cohorts of pregnant women, a higher prevalence of *Helicobacter pylori* was observed among women with secondary education (41.2%) compared to those with tertiary education (16.3%) and primary/no formal education with zero prevalence rates. The level of education of the pregnant women attending antenatal care had significant relationship with the prevalence of *Helicobacter pylori* in pregnant women. In the study by Smith et al. (2017), *H. pylori* infection was unrelated to education level. Similar findings were made in Denmark by Steffen et al. in 1996, who discovered that a decline in socioeconomic position increased the probability of chronic *H. pylori* infection. Low socioeconomic class individuals are more likely to have low levels of education, inadequate health education, and a greater propensity to reside in environments that increase the risk of faecal contamination of food and water (Bello et al., 2018). In order to reduce the impact of socioeconomic status on our findings, Abdollahi et al. (2014) attempted to match the cases and controls regarding gender, age, place of residence, and educational level status. They found no significant difference in the distribution of serum anti-*H. pylori* IgG between the two groups.

Hida *et al*. (1999) stated that *H. pylori* prevalence variation is proportional to the age, ethnicity and social and economic status of individual subjects screened. Among the cohorts of pregnant women, a higher prevalence of *Helicobacter pylori* was found among artisans (50.0%) compared to other occupational groups with various prevalence rates. This was followed by students (44.4%), traders (25.7%), business executives (14.3%), civil servants (9.1%), and unemployed (8.3%). According to statistics, there was no connection (p = 008) between employment and the frequency of *Helicobacter pylori* among expectant women. Bello et al. (2018) claim that multivariate logistic regression analysis in their study

demonstrated that being a member of a lower social class increases the probability of *H. pylori* infection. Similar claims that the frequency of *H. pylori* infection was higher in the lower social class than in the middle class and upper social class were made in research by Malaty and Grahamin (1994) in the USA. In the study by Smith et al. (2018), *H. pylori* infection was unrelated to occupation.

A higher prevalence of *Helicobacter pylori* was observed among pregnant women with no religion (22.2%) than those who were Christian (19.8%) and Muslim (0.0%). However, no significant association (p=0.86) was occurred between religion and the prevalence of *Helicobacter pylori* in pregnant women.

Infection with *H. pylori* is substantially correlated with crowding (Bello et al., 2018). However, no significant association (p=0.41) occurred between family types and *Helicobacter pylori* infection in this study. Pregnant women from monogamous families had higher rates of *Helicobacter pylori* than those from polygamous families. According to Bello et al. (2018), crowding is a statistically significant risk factor for *H. pylori* infection. According to a study by Torres et al. (1998), living conditions are a critical factor in how likely someone is to become infected with *H. pylori*. In the study by Smith et al. (2018), families with a history of ulcer/gastritis were considerably more likely to live in crowded housing.

Among these pregnant women, a higher prevalence of *Helicobacter pylori* occurred in pregnant women in their second trimesters (30.0%) than those in their third trimesters (12.5%) and first trimesters with zero prevalence rates. Significant association (p = 0.03) occurred between the gestation period and the prevalence of *Helicobacter pylori* occurring in pregnant women.

Among these pregnant women, a higher prevalence of *Helicobacter pylori* occurred in multiparous pregnant women (3-4 pregnancies) with a prevalence rate of 33.3% than those with 1-2 parity (18.2%) and nulliparous (15.8%). It shows that *Helicobacter pylori*'s prevalence increases with several pregnancies. However, no significant association (p = 0.28) exist between the parity and the prevalence of *H. pylori*.

Also, a higher prevalence of *Helicobacter pylori* occurred in pregnant women with no history of abortion (22.7%) than those with such a history (14.7%). However, no significant association (p = 0.34) occurred between the history of abortion and the prevalence of *Helicobacter pylori* in pregnant women.

A higher prevalence of *Helicobacter pylori* infection was found among participants with a history of STDs than those without. No significant association (p=0.56) was found between the history of STDs and the prevalence of *Helicobacter pylori* in pregnant women.

Socioeconomic level, home crowdedness, ethnicity, migration from high prevalence locations, and family member infection status are the risk and susceptibility variables for *H. pylori* infection (Atlas, 1995; Abdolvahab et al., 2006). Low socioeconomic status has been identified as a critical risk factor for acquiring *H. pylori* in studies (Tsai et al., 2005). Ajayi et al. (2021) observed that low standard of living, poor personal cleanliness, overcrowding, amount of education attained, lifestyle, and poverty might all contribute to the variance in the prevalence of *H. pylori* infection. According to Allaker et al. (2002), oral-oral or faecal-oral pathways account for most *H. pylori* transmission. Poor environmental cleanliness, overcrowding, and faecal pollution of water sources utilized for residential or agricultural irrigation of vegetables may have contributed to this.

Separate investigations by Etukudo et al. (2012) and Jemikajah and Okogun (2014) demonstrated that water obtained from wells and boreholes carries a higher risk of *H. pylori* infection than water obtained from pipes. Research by Bateson (1993) in Glasgow and Ogihara et al. (2000) in Jiangsu also showed that people who smoked cigarettes had a higher frequency of *H. pylori* than those who never smoked. So, it is crucial to comprehend the risk factors for developing *H. pylori* infection in Port Harcourt, Nigeria, to decrease the prevalence and, subsequently, the burden of the diseases brought on by this infection.

5. CONCLUSION

According to this study, there is a high prevalence of *H. pylori* infection in pregnant women in Port Harcourt, Nigeria. Only educational level and gestational periods were significantly linked with an increased risk of *H. pylori* infection among the socio-demographic factors examined. According to the study, *H. pylori* infection is a widespread public health issue among pregnant women in Port Harcourt, Nigeria. More research on the underlying mechanisms is required. Extensive health education is required to inform the public about infection risk factors and potential preventative actions.

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