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Highlights

- Vendors and Consumers Status
- Undergraduate Students of COOU
- Risk Factor of Intestinal Parasitic
- Clinicopathologic Profile of Gastric

Discovering Thoughts, Inventing Future

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Prevalence of Candidiasis amongst Undergraduate Students of COOU, Uli, Nigeria

By Umeaku, Chinyelu Nkiru; Ukoha, Chinwe Clarice; Ebe,Tochukwu Ezechi; Ozo, Chinwe Njideka; Egbuna, Helen Ifeoma; Ibekwe, Maureen Ifeynwa; Chukwuno, Esther Oluchukwu & Okeke, Ugochukwu Chibueze

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Abstract- Most urinary tract infections are due to Candida species, C. albicans being most prevalent. Laboratory research study was used to examine the prevalence of candidiasis amongst undergraduate students of Chukwuemeka Odumegwu Ojukwu University, Uli. A total of 100 students were investigated. Clean catch midstream urine samples were used for the analysis. Standard microbiological procedures were utilized. A structured questionnaire was issued to each student to obtain their socio-demographic data. Our study found Candida albicans in 14(14%) of the urine samples. Significant candidiasis was strongly associated with being female as higher percentage of the isolates were from female students. Of the 14(14.0%) positive urine samples, 4(28.6%) were from symptomatic students, whereas 10(71.4%) were asymptomatic.

Keywords: *candida albicans, candidiasis, urine samples, students.*

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Prevalence of Candidiasis amongst Undergraduate Students of COOU, Uli, Nigeria

Umeaku, Chinyelu Nkiru [α]; Ukoha, Chinwe Clarice [σ]; Ebe,Tochukwu Ezechi [ρ]; Ozo, Chinwe Njideka [ω]; Egbuna, Helen Ifeoma [¥]; Ibekwe, Maureen Ifeynwa [§]; Chukwuno, Esther Oluchukwu [χ] & Okeke, Ugochukwu Chibueze [ν]

Abstract- Most urinary tract infections are due to *Candida* species, *C. albicans* being most prevalent. Laboratory research study was used to examine the prevalence of candidiasis amongst undergraduate students of Chukwuemeka Odumegwu Ojukwu University, Uli. A total of 100 students were investigated. Clean catch midstream urine samples were used for the analysis. Standard microbiological procedures were utilized. A structured questionnaire was issued to each student to obtain their socio-demographic data. Our study found *Candida albicans* in 14(14%) of the urine samples. Significant candidiasis was strongly associated with being female as higher percentage of the isolates were from female students. Of the 14(14.0%) positive urine samples, 4(28.6%) were from symptomatic students, whereas 10(71.4%) were asymptomatic. Although candida vulvovaginitis occurs commonly, the reasons for its occurrence and recurrence are often unclear. Several potential risk factors have been described, including the recent use of antibiotics and oral contraceptives, uncontrolled diabetes, increased estrogen levels, impaired immune system, gastrointestinal colonization by the organism, and specific immunological defects. However, the data supporting each of these factors are conflicting, and to date, none are predictive of the infection. This study evaluates the potential risk factors of *C. albicans* and discusses the implications for clinical practice. We, therefore, recommend that further studies be carried out to determine the definite risk factors of candidiasis.

Keywords: candida albicans, candidiasis, urine samples, students.

I. Introduction

Vulvovaginal candidiasis (VVC) is a fungal or yeast infection. It is found in the lower genital tract, the vulva, and the vagina of females (Sobel, 2007). When this disease is caused by *Candida* species, it is known as candidiasis or moniliasis. VVC can be recurrent or relapsing (Nyirjesy and Sobel, 2003). This occurs when a female experiences four or more episodes of VVC per year. Asymptomatic infections occur in about 5% of healthy women (Reset *et al.,* 2000).

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VVC remains a common problem worldwide, affecting all strata of the society. The absence of rapid, simple, and inexpensive diagnostic tests continues to result in both over diagnosis and under diagnosis of VVC. *Candida albicans*, non-albican species, and immune suppression have led to the development of recurrent diseases, some of which do not respond to conventional antifungal drugs (Nwadiohae*t al.,* 2013).

According to McClelland *et al*. (2009), *Candida* spp. are part of the lower genital tract flora in 20%–50% of healthy women. In line with the studies of Singh (2003), *C. albicans* is the most frequent colonizer and is incriminated in most cases of VVC. Over the last ten years, research evidence has demonstrated an increase in the frequency of cases caused by other species of *Candida*. *C. glabrata* is also a leading cause of VVC (Ray *et al*., 2007).

About 75% of women will experience at least one episode of VVC during their lifetime. 70 – 75% of healthy adult women have had at least one episode of VVC during their reproductive life, and half of the college women will by the age of 25 years have had one case of VVC diagnosed by a physician (Sobel, 2007). VVC is not a sexually transmitted disease, because it also affects children and women who abstain themselves from sexual relationships. However, it can be transmitted sexually (de Leon *et al.,* 2002). Diagnosis of VVC should not be based solely on patient history and a genital examination because of its low specificity of symptoms and signs. In addition, other causes like leukorrhea and pruritus vulvae mimic VVC (Geiger and Foxman, 2006). Therefore, to have a definitive diagnosis of VVC, cultural isolation and identification of *Candida* spp. are crucial.

Previous findings have provided data on the prevalence of VVC. It is interesting to note that most previous studies focused on immune compromised subjects, especially pregnant women, diabetics, subjects on broad-spectrum antibiotic therapy, women on oral contraception with high estrogen content, and HIV-positive subjects, with few studies on otherwise immunocompetent women. Interrelationships between *Lactobacillus acidophilus* and other endogenous flora, estrogen, glycogen, vaginal pH, and metabolic by-products of these micro biomes determine a healthy vagina. *L. acidophilus* produces hydrogen peroxide

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(as a by-product of metabolism), which is toxic to pathogens and keeps the healthy vaginal pH acidic. Alterations of the vaginal micro flora by invading pathogens or biochemical changes in the environment results in vaginitis (Odds, 2008).

Changes in the vaginal environment, *Candida* population, and their adherence to vaginal epithelial cells enhance the germination of daughter yeast cells (Sobel, 2007). These changes and attendant multiplication of *Candida* cells may transform asymptomatic colonization into symptomatic infection. VVC, like many vulva diseases, has the potential to cause psychological distress and negatively impact patient's quality of life.

a) Aim of the Study

Our study aims to assess the level of urethritis due to *Candida albicans* amongst undergraduate students of Chukwuemeka Odumegu Ojukwu University, Uli.

b) Specific Objectives

- Determination of the prevalence of candidiasis amongst undergraduate students
- Correlation of the prevalence rates with age, sex, and other risk factors
- Evaluating the effects of predisposing factors on both symptomatic and asymptomatic persons.

c) Significance of the Study

Fungal infections of the urinary tract especially, those caused by *Candida albicans* are becoming increasingly common. Urethritis due to *Candida* is mostly misdiagnosed or undiagnosed, as most studies concentrate on the bacterial urinary tract infections. Studies on the epidemiology of fungal urinary tract infections are limited in apparently healthy individuals since most studies were carried out in the hospital settings amongst hospitalized patients.

There are few studies that provide good databases for guiding public health practitioners on the diagnostic criteria and therapeutic pathways.

d) Limitation of the Study

The study population was undergraduate students. This made the research participants selective. Collection of urine samples from students was burdensome due to the misconceptions and fear of societal ills. Some students refused to fill the questionnaires.

II. Materials and Methods

a) Study Population

One hundred students of Chukwuemeka Odumegwu Ojukwu University, Uli were randomly selected for this research. Only undergraduate students in regular programs were used. Consent was obtained from the participants.

b) Sampling Procedures

i. *Administration of questionnaires*

We obtained baseline socio demographic data using well-structured questionnaires and ensured confidentiality amongst the respondents.

ii. *Collection of urine samples*

We gave well-labeled sterile wide-mouthed screw-capped plastic containers with the same unique numbers as written on the questionnaires to the respondents. Each student was instructed on how to collect clean-catch midstream urine sample. 10 ml was obtained from each student.

iii. *Media used*

Sabouraud dextrose agar (SDA) and cornmeal agar (CMA) were used.

c) Culture and Identification of Candida albicans

Sterile cornmeal agar plates were inoculated with the urine specimens and incubated at 25°C for 72 hours. Each plate was read daily, recording the colony size, color and shapes. The isolates were subsequently streaked on sterile Sabouraud dextrose agar plates and incubated at 30°C for 4days. The pure cultures were Gram-stained and observed microscopically using x100 oil immersion objective (WHO, 2003).

i. *Germ tube test*

The pure cultures were suspended in test tubes containing 0.5ml human serum. These were incubated at 35°Cfor 2 hours. A drop of the yeast-serum suspension was placed on a microscope slide and overlaid with a coverslip. This was examined microscopically for the presence of Germ tubes (Winn *et al.,* 2006).

III. Results

We present the socio-demographic characteristics of the study subjects in Table 1. Of the 100 students examined, 80(80.0%) were female and 20(20.0%) were male. Only 8 of the sampled students were married, none was pregnant. Of the sampled students 11(11.0%) knew about urinary tract infection, but only 7(7.0%) had history of urinary tract infection (previously suffered from it). 17% were symptomatic whereas the remaining 83% were asymptomatic. More so, 17(77.2%) students had used antibiotics either by prescription or self-medication, 5(22.7%) said they have not used it.

14 had *Candida* positive cultures making the prevalence of vulvovaginal candidiasis 14.0%. *Candida* positive cultures were observed mostly among ages 21-30 years [11(11.0%)]. The majority of students in this age group were in their third to final year and are sexually active. The prevalence of infection between the age groups was statistically not significant ($P > 0.05$). Therefore, there is no significant difference between the age groups.

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Table 1: Socio-demographic characteristics (n=100)

Gender	No. of students	Prevalence(%)
Female	80	80.0
Male	20	20.0
Marital Status		
Single	92	92.0
Married	8	8.0
Knowledge of Urinary Tract Infection		
Yes	11	11.0
No	89	89.0
History of Urinary Tract Infection		
Yes	7	7.0
No	93	93.0
History of Antibiotics Use (for UTI or Other Infections)		
Yes	51	51.0
No	49	49.0

Table 2: Age distribution of candidiasis among undergraduate students of COOU, Uli

Age (years)	No. Examined	No. Positive	Prevalence(%)
15-20	7	3	3.0
21-25	54	6	6.0
26-30	37	5	5.0
Above 30	2	0	0.0
Total	100	14	14.0

Out of the 100 urine samples cultured, 14 showed Candida growth, and the 14 were from female students. The prevalence of infection between the sexes was statistically not significant (P> 0.05). Therefore, there is no significant difference between sexes.

Table 3: Distribution of *Candida* growth in urine culture according to sex of the students

Urine culture		No (%) of results		
		Male	Female	Total
Positive	0(00.0)	14(17.5)	14(14.0)	
Negative		20(100.0)	66(82.5)	86(86.0)
Total		**20(100.0)**	**80(100.0)**	**100(100.0)**

Table 4: Distribution of *Candida* positive cultures across

Clinical presentation	No. examined	No. positive	Prevalence
Symptomatic	17(17.0%)	4(28.6)	23.5(66.2%)
Asymptomatic	83(83.0%)	10(71.4)	12.0(33.8%)
Total	**100(100.0%)**	**14(100.0%)**	**35.5(100.0%)**

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IV. Discussion

Our study found the prevalence of vaginal candidiasis amongst undergraduate students of Chukwuemeka Odumegwu Ojukwu University, Uli, Nigeria to be 14%. Our result is lower than that reported by Aringe*t al.*(2012). In their study the prevalence of candidiasis was 16.5%, 21.31%, and 19 % respectively.

The relatively low prevalence we observed may be attributed to adequate knowledge, good personal hygiene, and normal levels of estrogens and corticoids amongst undergraduate students. Our result is however, in agreement with the studies of Fernández *et al.* (2004).

We observed candidiasis in students between ages 20 – 30 [17 (8.5%)]. Students below the age of20 had least infection prevalence. These findings do not align with the studies of Alo *et al.* (2012) who reported a higher prevalence of *C. albicans* (33.33%) within the age bracket of 36 – 40 years. In their study, age group between 20 and 25 years had the lowest prevalence (20.42%). This outcome agreed with the studies of Akortha *et al.* (2009), and Willacy and Jackson (2011), who reported peak vaginal infections between ages 20 and 40 years. Women within ages 26–30 represent the peak of childbearing in Nigerian societies, this group is also the sexually active one.

There was no statistically significant relationship between the prevalence of VVC with age ($P>0.05$) or clinical symptoms of ill health ($P>0.05$). This may be due to recurrent infections that might have contributed to the resistance of the vagina to candidiasis. Subjects with vulvovaginal discomfort had a higher percentage of *Candida*-positive cultures (29.1%) than those with no vulvovaginal discomfort (11.9%). This report is in agreement with the findings of Jombo *et al*. (2010). It is reasonable to believe that young women with genital discomfort consult health care centers more often than women without such symptoms (Jombo *et al.,* 2010).

All subjects with positive *Candida* culture results had already been on antibacterial therapy prior to their hospital visit – 28 (100%). This finding is in conformity with the fact that prolonged antibacterial use usually affects vaginal bacteria micro flora population and biochemical activity (mainly *L. acidophilus*), which thus increases vaginal pH as a result of reduced CO_2 production. This feature, alongside other factors (such as hormonal factors), encourages *Candida* overgrowth, consequently leading to vulvovaginitis (Bauters *et al*., 2002).

Although the widespread use of antibiotics has been suggested as one of the major factors contributing to the rising incidence of VVC, (Foxman *et al.,*2008)some case-control studies (Geiger *et al.,*2006) found no evidence of an association between antibiotic agents and symptomatic VCC, whereas others reached the opposite conclusion (Spinillo *et al*.,2009).

V. Conclusion

There is a need to create awareness of the involvement of *Candida* spp. in genital discomfort, especially vaginal candidiasis, amongst undergraduate students with or without notable signs and symptoms. It is worthwhile to consider culture test as adjunctive in combination with clinical symptoms in the definitive diagnosis of VVC. More work is required to build on findings generated from this study.

VI. Recommendations

We recommend the following:

- The presence of candidiasis among apparently healthy individuals should not be neglected.
- Follow-up studies on the appropriate management of asymptomatic candidiasis should be conducted periodically.
- Role of antibiotic usage should be reviewed to delineate the cause of antibiotic resistance in recurrent VVC.
- Factors that promote candidiasis among students should be addressed promptly through extensive public health enlightenment programs.

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Vendors and Consumers Status and Microbial Analysis of Open Restaurant Foods in Patuakhali District University

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Abstract- Open restaurant food vendor and consumer status as well as hygienic condition of different types of food at Dumki, Patuakhali upazila, and Kuakata union of Patuakhali district were determined. Ninety shops with 180 open restaurant food samples were collected. Among the food vendors, 97.78% were male. Maximum (68%) of them were between 21-40 years of age. The majority (54%) of them were primary educated. Half of the vending shops located on the sidewalk and one third on the footpath. The majority (81%) of the respondent had their daily net profit up to TK. 500. About 64% of vendors did not cover their food while selling; 47.78% used unclean towels and 27.78 % used plate followed by paper & polythene (49.45%) as a serving media. Everyone used tube-well water as drinking water. The few had a business permit or food-selling permit. Maximum (83.33%) consumers were male, and the highest consumers (76.667%) were aged between 21-40 years. The majority (57.77%) of consumers always consume foods on roadside. 60% of the consumers suffered from diseases. Only 4.44% of consumer had enough knowledge about nutrition and 8.89% in hygiene.

Keywords: *open restaurant; vendor; microbial analysis; salmonella; E. coli.*

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Vendors and Consumers Status and Microbial Analysis of Open Restaurant Foods in Patuakhali District

Sujan Kanti Mali [α], Md. Rabiul Haque [σ], Liton Chandra Sen [ρ], Sourav Debnath [ω] & Md. Hasan Rashid [¥]

Abstract- Open restaurant food vendor and consumer status as well as hygienic condition of different types of food at Dumki, Patuakhali upazila, and Kuakata union of Patuakhali district were determined. Ninety shops with 180 open restaurant food samples were collected. Among the food vendors, 97.78% were male. Maximum (68%) of them were between 21-40 years of age. The majority (54%) of them were primary educated. Half of the vending shops located on the sidewalk and one third on the footpath. The majority (81%) of the respondent had their daily net profit up to TK. 500. About 64% of vendors did not cover their food while selling; 47.78% used unclean towels and 27.78 % used plate followed by paper & polythene (49.45%) as a serving media. Everyone used tube-well water as drinking water. The few had a business permit or food-selling permit. Maximum (83.33%) consumers were male, and the highest consumers (76.667%) were aged between 21-40 years. The majority (57.77%) of consumers always consume foods on roadside. 60% of the consumers suffered from diseases. Only 4.44% of consumer had enough knowledge about nutrition and 8.89% in hygiene. About all food items contained E. coli. and salmonella. Water and salad was fully contaminated by this microorganism.

Keywords: open restaurant; vendor; microbial analysis; salmonella; E. coli.

I. Introduction

Open restaurant food vending and consuming is a popular type of informal self-employment in the Patuakhali district, providing the vendors with a means to sustain their livelihoods. Vendors sell a great variety of products from different kinds of vending units. A study in Uganda (Ayalew, M. S., 2008) showed that most vendors earned more than the minimum civil service wage and many earned more than the minimum wage. In developing countries, drinks, meals, and snacks sold by street food vendors widely consumed by millions of people (FAO, 1988). In Bangladesh, the quality and quantity of food supplies by vendor systems are not so inadequate but unhygienic for health. The street foods provide an affordable source of nutrients to many sectors of the population (Ohiokpehai, 2003). Within this context, street foods as informal food supply system, opportunities for resource- poor groups in urban and peri-urban environments, not only as a means of employment but also as an effective way of providing low-cost nutrition to the people (Codjia, 2000).

The present study also showed a daily income of vendors to be up to TK. 1746.50 with a net profit up to TK. 283.00./day. Though this figure is not that encouraging, however, when the credibility in terms of safety of street foods will increase, it will contribute to better earnings of the vendors. They tied to retailers, cooking units, and other food system actors. Specific consumer groups with street food eating habits found to exist. Among various types of informal sector activities, food vending is distinctive in the sense that it provides a need for the urban inhabitants and involves issues of hygiene and food safety. A large number of dwellers from different spheres of life such as students, tourists, rickshaw drivers, cart pullers, and other such workers rely on open restaurant food vendors for their daily meals. Urban food vending provides employment and income for many people. However, street foods are frequently associated with many food and water born disease like, diarrhea, hepatitis, typhoid, etc diseases due to their handlings and use of dirty water. The open restaurant foods vendors are not aware of all about health hygienic and microbial aspects of food and drinking water. Especially the coastal belt of Bangladesh is naturally rich in soil and water-borne pathogens.

II. Materials and Methodology

a) Sample selection and sample size

90 open restaurants and 90 consumers included in the present survey were therefore, a purposive sample chosen primarily to represent some of the key characteristics associated with them.

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b) Interview schedule design

The interview schedule developed for collecting socioeconomic information, health aspects of food, and environmental aspects of food after developing the Interview schedule it was pre-tested among five sellers, and five consumers and necessary correction done for the final Interview schedules. Those Interview schedule field tested, modified, and standardized.

c) Equipment and general procedure for microbial examination

i. All glass equipment, e.g., Petri dish, Pipette, Test tube, Beaker & other glass wares were washed, rinsed, dried, and treated a hot air oven for sterilization. Sterilization is done by dry heat at 170˚c for 1 hour.

ii. All the media prepared for microbial growth sterilized by steam pressure using 121˚c at 15 lb/ square inch pressure for 5 minute.

d) Preparations of food samples

Homogenate food samples prepared by taking 10gm of both superficial & inner layers of samples and weighed on a sterile weighing paper using sterile scalpels or forceps, and washing with alcohol before & each batch of samples and between samples washed with hot water and sterilized with alcohol. These meshed samples inserted aseptically into sterile cotton plugged conical flask containing 0.9% sterile sodium chloride solution by using sterile forceps.

e) Bacteriological analysis

Three different types of media were recommended for the growth of Salmonella and E. coli. The colonies developed on the plates and counted after incubation for 24-48 hours at 37˚c and pH of the media adjusted to 7.2 prior to sterilization. Inoculated plates incubated at 37˚c for 24 -48 hours to facilitate viable bacterial growth.

f) Total aerobic plate count

Duplicate pour plates of four successive decimal dilutions prepared. The plates incubated at 37°C for 24-48 hours, and duplicate plates counted and calculated. Average counts expressed as colony-forming units per gram or ml of sample.

g) Coliform count

The coliform count of the food and water samples determined using membrane filter technique. The plates incubated at 35°C for 24 hours.

h) Data management and analysis

The quality of the data entry process commenced as the questionnaires collected from the surveyed areas after the process of cleaning the mistakes. Data entry process managed to apply double-data entry errors. All questionnaires edited and the data were cleaned, and entered into a computer. The data were analyzed by SPSS 20.0 package. Results expressed as frequencies and percentages.

III. Results

a) Results of open restaurant food vendor

i. *Socio-economic and demographic profile of open restaurant food vendors*

Most of the vendors were male (97.78%). About 68% of them were age between 21-40 years (mean about 31 years) while, 23.33% were age between 41-60 years. About 73.33% of vendors were married, 43.33% of them had a family size of 5 or less, and the rest 56.67% had a family size higher than 5. About 54% of vendors who had primary education followed by nearly 10%, 5.56%, and 5.56% vendors had SSC, HSC, and Degree education respectively, and 24.44% of vendors were illiterate. Only 3.33% of vendors in Patuakhali had Degree education while, 20% of them were illiterate in Dumki comprising the lowest percentage among the three survey areas.

ii. *Ownership and reason for doing food vending business*

The survey, it was revealed that 74.45% vendors owned and half of the vendors (51.11%) had the opinion that due to the low investment, and skill required they had come into the open restaurant food vending business (Figures 1).

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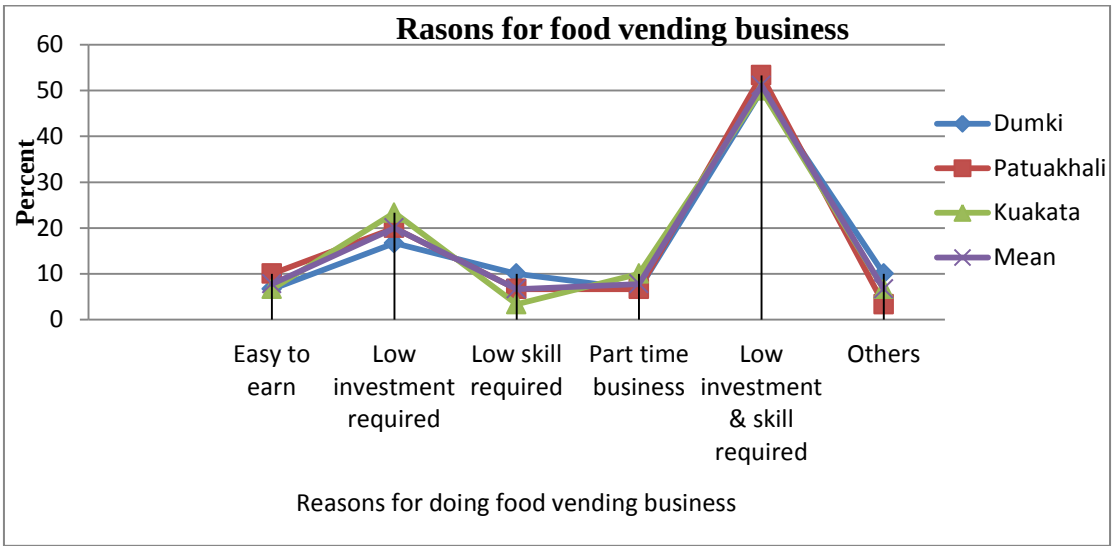


Figure 1: Reasons for food vending business of the open restaurant food vendor

iii. *Nature of shop and the vending business*

An open restaurant business requires medium investment. Most of the vendors own the business and reportedly work for 13-18 hours, running their open restaurant food vending as the principal business. Some members are engaged in open restaurant food vending business as their principal business though they have other income sources. Some vendors are solely engaged in open restaurant food vending as they do not have any other business. A small number of vendors engaged in part- time food vending. Nearly 82.22% of the food vendors reported it was their principal business while only 17.78% of them accepted open restaurant food vending as a part-time.

iv. *Length and period of business of street food vending*

The majority of the open restaurant food vendors had been doing business from 4 to 10 years in respective of the areas surveyed with the mean is 38.887%. In Kuakata, no open restaurant food vendors had been starting business up to one year.

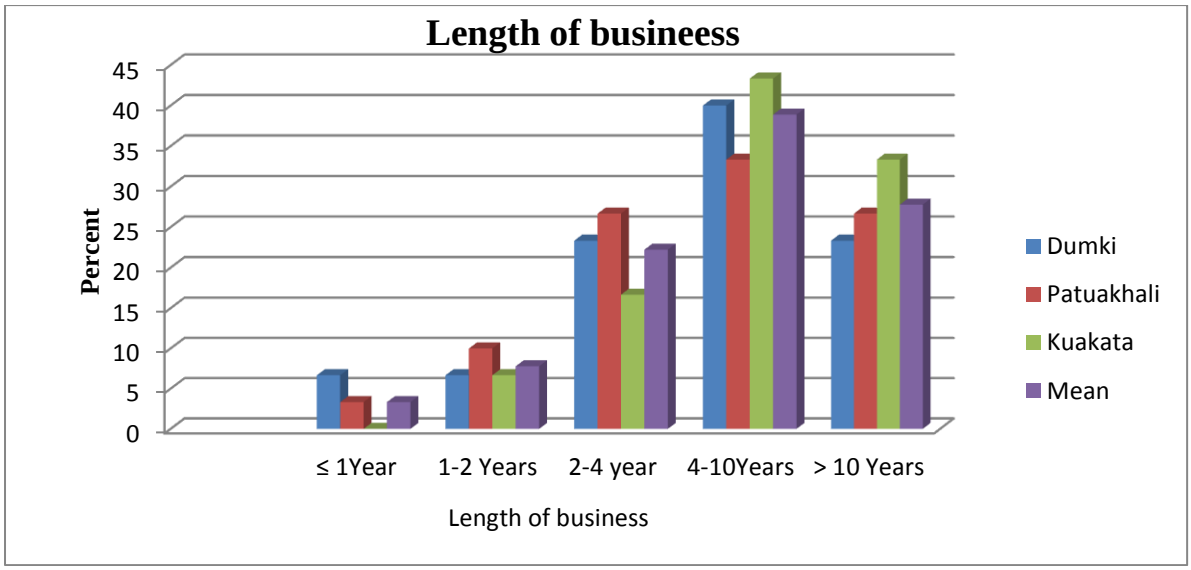


Figure 2: Length of business of the open restaurant food vendor

v. *Location and proximity of vending shops*

During the survey, it was revealed that 43.33 of the vending shops located on the sidewalk and 33% on the footpath in three survey areas and the rest in all other possible areas (near aisles of the bazaar, school, restaurant and office vicinity. 46.67 % of food vending shops in Dumki and 40% in the Patuakhali area and nearly 30% vending business in the Kuakata area

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located near the side of drain, sewerage, toilet and dustbins.

vi. *Nature of business and daily capital/net profit*

The vendors were unsatisfied about their investment, daily income, and net profit of the food vending business. Forty-one percent of vendors invested up to TK. 100000 in their business. Nearly 40% of vendors' daily sales range between TK. 1001-2000 and 81% make a net profit of more than TK. 500 daily. It observed that the average investment was higher in the Kuakata area amount in TK 97383 and less in Dumki amount in TK 78000. Patuakhali area placed in between the other two with TK 97333. However, more than 50% of vendors reported that net profit met 100% of their family expenditure.

Table 1: Daily capital/sale profile of the open restaurant food vendor

Upazila Name	Minimum (TK)	Maximum (TK)	Mean (TK)	Standard Deviation
Investment of the open restaurant food vendors				
Dumki	20000	300000	78000	± 39315.57
Patuakhali	20000	250000	97333	± 49320.274
Kuakata	1500	320000	97383	± 57894.95
Daily income of the open restaurant food vendors				
Dumki	1000	6000	3780	± 1954.023
Patuakhali	1000	7000	4,395	± 2064.84
Kuakata	1500	8000	5400	± 1975.15
Daily net income of the open restaurant food vendors				
Dumki	400	2400	1,357	± 485.43
Patuakhali	450	2500	1140	± 560.54
Kuakata	500	3000	1,653	± 691.34
Shop rent of the open restaurant food vendors				
Dumki	1200	3000	2005.556	± 485.64
Patuakhali	1000	3500	2278.261	± 674.17
Kuakata	1200	5000	2133.33	± 866.79

vii. *Working schedule of the vendors*

During the survey, it was revealed that (86.667%) worked all time. Food vending in residential areas was comparatively higher (90%). Seventy-five percent of the vendors worked for 13-18 hours in a day. The maximum sale was at noon and lowest was at morning. Winter was the season of maximum sale and while minimum during the summer. It was difficult to maintain the vending during the summer and rainy season, and consumers did not go outside. Winter season was more comfortable for both vendors and consumers. The majority (57.22%) of the vendors continued their business from morning to midnight. 77.23% of vendors washed their hand before preparing foods. However, 60% food handlers did not clear their hands before serving food which support the report of' Bangkok where over 60% of street food vendors washed preparation equipments and eating utensils once it day (FAO, 1994).

viii. *Licenses/permits*

About 67% of the vendors replied when they asked whether they had to pay shop rent for doing their vending businesses. The rest 33% of vendors had own shop. All vendors agreed that they did not pay money to the Police, market committee, and others. Over 100% of the street food vendors felt they should have a license for their business but, 74.44% had. The few, who said they had the licenses, had a business permit or food-selling permit. The food vendors told whether they had any training on food safety and food serving or not. Cent percent of the vendors had no training either on food safety or on food serving irrespective of the survey areas.

ix. *Food safety profile*

In street food vending, the raw material source was important as their contamination from this point could persist through preparation, processing, and cooking. Quality of the raw materials were important to the safety of vended food because of the biological, chemical and physical hazards that might be introduced to the vending operations and which may persist through preparation and processing.

a. *Water, environment, sanitation and personal hygiene*

Cent percent reported that the source of drinking water for consumers was stored water that was collected from the nearby tube well. The water always stored in plastic drums without lids, thus making it more susceptible to contamination. Most of the male labor brings water, and 67.777% bring 3 or less.

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Table 2: Water management of the open restaurant food vendors in percentage (n=90)

Characteristics	Dumki	Patuakhali	Kuakata	Mean
water bringing person				
Male labor	93.33	90	93.33	92.22
Female labor	6.67	10	6.67	7.78
Water bringing times				
<= 3	66.67	73.33	63.33	67.78
> 3	33.33	26.67	36.67	32.22
Have own tube well				
Yes	6.67	10	66.67	27.78
No	93.33	90	33.33	72.22
Water disposal place				
Drain	10	13.33	6.67	10
Dustbin	6.67	6.67	3.33	5.56
Roadside	26.67	40	43.33	36.67
Others (Pond,River etc)	56.67	40	46.67	47.78

b. *Safe water using practices*

One of the striking findings found in the survey was that 100% of vendors did not take any measures for purification of drinking water, which implies a definite possibility of contamination. Drinking water did not boil irrespective of the location.

x. *Mode of display of food by open restaurant vendor*

The majority of the vendors displayed their foods in baskets/trays, bowl, and shelves in survey area while vendors used showcase in Patuakhali and Kuakata areas. The utensils they used made up of many different materials such as melamine, aluminum, stainless steel, and ceramics. Some vendors used only paper instead of a plate. Tissue paper used 68.89% of vendors.

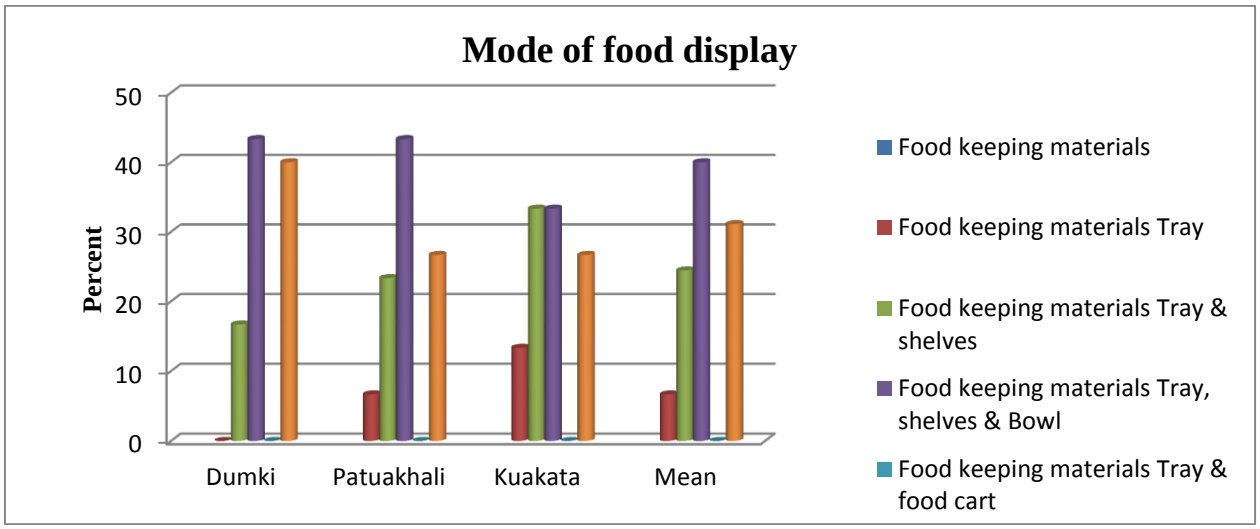


Figure 3: Mode of food display by the open restaurant food vendor

Table 3: Utensil of serving food of the open restaurant food vendors

Characteristics	Dumki	Patuakhali	Kuakata	Mean
Utensil During Serving food (%)				
Paper	0	0	0	0
plate	16.67	23.33	33.33	24.443
Cup & Glass	0	0	0	0
Plate & Polythene	83.33	76.67	66.67	75.557
Cup, Glass & Spoon	0	0	0	0

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xi. *Protective display of food*

About 64% of the vendors did not cover their food during selling. 56.67% cleaned the utensils in their shop but 13% on the roadside. Two thirds of food vendors used stored water for cleaning the utensil. The time between food making, and food selling more than 5 hours was 61.11%, and 38.89% was 5 or less. Ninety percent of open restaurant vendors used soybean oil and frequency of using oil was one used by 70% of the vendors.

xii. *Food servicing system of open restaurant food vendor*

Eighty-three percent of the vendors served food to the consumers with plate and polythene in Dumki area as against 66.67% vendors who used plate in Kuakata area. About 28.89% of the vendors disposed of their garbage in the pond, and (27.78%) threw them in the drain and roadside. Pond and river was the place of best choice (about 47.78%) and 36.667% on the roadside for disposal of used water. The use of public toilets or open places outside was the highest among the vendors. Some of the vendors used their own house as the second option. In all areas surveyed, almost all vendors washed their hands using soap water after toilet.

Table 4: Percent water and sanitation profile of the open restaurant food vendors (n=90)

Characteristics	Dumki	Patuakhali	Kuakata	Mean
Place of utensils clean				
Shop	60	53.33	56.67	56.67
Own house	16.67	6.67	6.67	10
Roadside	10	13.33	16.67	13.33
Others(Pond, River etc)	13.33	26.67	20	20
Type of water used to clean utensils				
Stored water	63.33	60	83.33	68.89
Tap water	0	3.33	0	0.11
River water	23.33	26.67	0	16.67
Others	13.33	10	16.67	13.33
Garbage disposal				
Dustbin	10	3.33	16.67	10
Drain	6.67	10	0	5.56
Road side	16.67	26.67	40	27.78
Pond	40	30	16.67	28.89
River	16.67	23.33	0	13.33
Others	10	6.67	26.67	14.45
Toilet uses				
Public toilet	53.33	53.33	33.33	46.67
Shop toilet	30	40	60	43.33
Own house	16.67	6.67	6.67	10
Neighbor house	0	0	0	0
Roadside	0	0	0	0
Others	0	0	0	0
Washing hands after using the toilet				
Yes	100	100	100	100
No	0	0	0	0
Sometimes	0	0	0	0
Washing hand before food preparation				
Always	76.67	80	70	75.56
Sometimes	16.67	20	30	22.22
Very few times	6.67	0	0	2.22
Never	0	0	0	0
Washing hands before food serving				
Always	43.33	53.33	40	45.55
Sometimes	56.67	46.67	60	54.45
Once a day	0	0	0	0
Never	0	0	0	0
Cleaning time of dirty plate				
Morning	6.67	10	3.33	6.67
Noon	0	0	0	0
After noon	0	0	0	0

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Night	6.67	16.67	20	14.44
Throughout the day	86.67	73.33	76.67	78.89
Morning to Mid night	0	0	0	0

xiii. *Source of food sold by the vendors*

A majority of the vendors prepared their food at home and brought to the streets for marketing. A single vendor was engaged in selling more than one food item. Almost 55.557%t of food vendor cooked/prepared foods in advance in their hotel kitchen while 28.89% vendors bought their foods for vending from open front place etc. 11.11% of vendors brought cooked food from home, 5.556% of vendors prepared food from other places remain for ready to eat.

Table 5: Food selling time of open restaurant vendors

Characteristics	Dumki	Patuakhali	Kuakata	Mean
Food selling time (%)				
Only Morning	0	0	0	0
Only Noon	0	0	0	0
Only After noon	0	0	0	0
Only Night	0	0	0	0
Throughout the day	6.67	13.33	13.33	11.110
Morning to Mid night	93.33	86.67	86.67	88.890

xiv. *Personal hygiene of the open restaurant vendors*

All of them usually did not cover their head during vending, 47.78% used dirty towels. But nearly 80% of the vendors' cut their nails properly, and 61.11% wore neat and clean attire. None was found to use hand gloves. Ninety percent of open- restaurant vendors did not cover their heads during vending.

xv. *Supervision and monitoring of the open restaurant food vendors*

About 88.89% of open restaurant vendors said that shops supervised regularly, and 87.65% were mobile court. Supervision occurred yearly and fined several times

xvi. Open restaurant food ingredient

Most of the vendors (93.33%) said that street food ingredients were bought from Kacha markets and 34.443% store in the shop and kept the prepared food in open showcase told 33.333% of vendors.

xvii. *Knowledge regarding food nutrition of the consumer*

Knowledge regarding food nutrition was not satisfactory. Only 4.44% of consumers had well knowledge about nutrition and 8.89% in hygiene. Food safety, food serving and other was very dull. Food preparation and hotel management knew moderately 66.67%, and 55.557% of vendors. The food serving practice was very poor. Fifteen percent vendors did not know about food safety. Fifty-one percent moderately knew consumers perception.

Table 6: Percent knowledge regarding food nutrition of the open restaurant food vendors (n=90)

Characteristics	Location	Well	Not so well	Moderate	Bad	Very bad	None
Nutritional	Dumki	3.33	6.67	20	23.33	40	6.67
	Patuakhali	3.33	10	26.67	26.67	23.33	10
	Kuakata	6.67	10	26.67	20	26.67	10
	Mean	4.44	8.89	24.45	23.33	30	8.89
Hygiene	Dumki	0	20	30	36.67	13.33	0
	Patuakhali	0	10	36.67	30	23.33	0
	Kuakata	3.33	13.33	33.33	26.67	20	3.33
	Mean	1.11	14.44	33.33	31.11	18.89	1.11
Food preparation	Dumki	0	0	83.33	10	6.67	0
	Patuakhali	0	0	76.67	13.33	10	0
	Kuakata	0	3.33	66.67	16.67	13.33	0
	Mean	0	1.11	75.56	13.33	10	0
Food safety	Dumki	0	0	10	40	33.33	16.67
	Patuakhali	0	0	13.33	43.33	26.67	16.67
	Kuakata	3.33	6.67	20	33.33	23.33	13.33
	Mean	1.11	2.22	14.44	38.89	27.78	15.56

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Food serving	Dumki	0	16.67	33.33	33.33	16.67	0
	Patuakhali	0	13.33	40	30	16.67	0
	Kuakata	0	16.67	43.33	26.67	13.33	0
	Mean	0	15.56	38.89	30	15.56	0

xviii. *Consumer aspect of the open restaurant food vendors*

In the survey, it was observed that 100% vendor told tourists was the regular customer, and no student ate there. On the other hand in Dumki and Patuakhali Upazila there were no tourists. Most of the vendors said that Labor, Rickshaw puller and Driver was the regular customer. Seventy percent vendor's opinion was consumers ate these foods for easy access and safe time. Open restaurant food supply proper nutrient told 58.887% of vendors.

Table 7: Consumer aspect of the open restaurant food vendors

Regular Customer (%)						
Location	Student	Labor	Rickshaw puller	Driver	General people	Tourist
Dumki	50	93.33	76.67	73.33	53.33	0
Patuakhali	56.67	90	80	76.67	56.67	0
Kuakata	0	83.33	66.67	70	53.33	100
Mean	35.35	88.887	74.447	73.333	54.443	33.33
Why consumers buy these foods? (%)						
Location	Taste	Cheaper	Safe time	Easy access	Nutrient supply	Others
Dumki	33.33	16.67	83.33	86.67	60	0
Patuakhali	46.67	23.33	73.33	80	63.33	10
Kuakata	53.33	26.67	60	50	53.33	13.33
Mean	44.443	22.223	72.220	72.223	58.887	7.777

xix. *Types of vended food*

Most of the vendors sold food item such as rice, fish, meat, brainy, vegetables ect.

Table 8: Types of vended food of the open restaurant food vendors

Types of vended food								
Location	Rice	Fish	Egg curry	Chicken	Beef	Bread	Khichuri	Brainy
Dumki	100	96.67	100	66.67	50	53.33	56.67	40
Patuakhali	100	100	93.33	70	46.67	43.33	33.33	46.67
Kuakata	100	100	56.67	90	56.67	83.33	16.67	80
Mean	100.00	98.8	83.333	75.557	51.11	59.99	35.55	55.55

b) Results of consumers of Open Restaurant food

i. *Socio-demographic characteristics of the consumers*

Among the interviewed consumers maximum were male (83.33%) and age ranged between 10-60 years. It found that majority of them were married (55.577%), and 1.11% of divorced. A majority consumer had S.S.C/ H.S.C. education (34.66%) followed by Illiterate (10%), and higher educated (30%). Consumers were from different occupations. The majority of them were students (38.89%) followed by the business (32.223%), and employer (14.4%). Maximum (31.113%) consumer was with no income.

ii. *Nature of consuming area of the consumer*

Most of the consuming areas (57.78%) were station; middle classes were 36.667%, and slum 5.557%. In Dumki 70% of consumers consumed food in the station.

iii. *Personal hygiene of the consumers*

The survey report of the consumers observed that almost 68.89% found to use a clean dress. But 72% of the consumers cut their nails properly. None found to use hand gloves during survey conducted. Vaccinated consumers were 52.223% of the total consumers.

iv. Personal hygiene

The source of drinking water collected from the nearby tube well and stored in plastic drums without lids. Before food eating, 44.447% of consumers washed hand, and never washed hand at 21.11%. The majority percent (75.557%) of consumers said that vendors cleaned their dirty plates throughout the day; Most of the consumer (61.113%) told foods did not clean and 52.223% told foods were not cover properly. Cleaning table and food serving done the same person. Used water disposed at the roadside.

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v. *Mode of display of street food*

The majority of the vendors displayed their foods in baskets/trays, bowl, and shelves, while vendors used showcase. About 38.89% of consumers had no idea of food preservation and 46.667% told vendors preserved food normally. A majority of consumers consumed always in road side. Major portion of consumer's ate roadside foods as it was safe time and easy access, although only 61.11% of them received it as unhygienic food. The same report found in Peru where the sanitary conditions utensils and tables judged to be substandard in 76 to 89 % of the inspection (FAO, 1990).

vi. *Knowledge regarding food nutrition of the consumer*

Knowledge regarding foods nutrition of the consumers was not satisfactory. Only 22.223% of consumers had knowledge about nutrition and 18.89% in hygiene. Through media and school campaign, people could learn more told 34.447% and 58.887% said that media and the internet were the best way to learn more. Seventy- three percent consumers had idea about food borne pathogen and 74.443% told this pathogen sometimes caused diseases.

vii. *Food safety perception and behavior of the consumer*

It observed that 60% of the consumers suffered from diseases like diarrhea, stomach upset etc. To avoiding disease 62.223% consumers opinion ate less food.

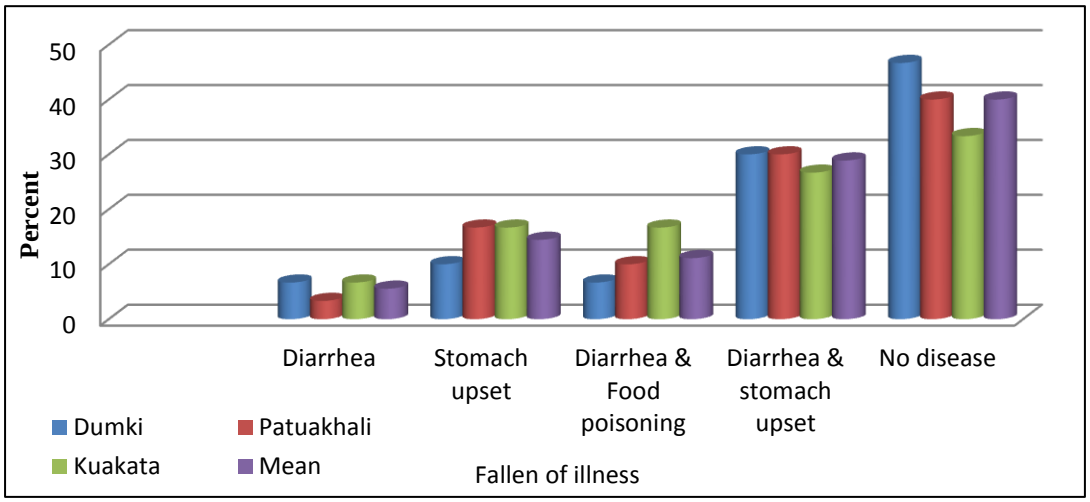


Figure 4: Types of disease afffect the consumer

viii. *Criteria for choosing vendor of the consumer*

Nearly 50% of consumers ate street food where the place was clean, and 83.333% shift where they found better option. Preferences of choosing a place 98.89% of consumers select cleanliness, 67.777% for freshness, 47.777% for time, and 30% for low price.

c) *Results of Microbial analysis*

E. coli. and salmonella count in open restaurant foods About all food items contained E. coli. and salmonella. Water and salad fully contaminated by this microorganism.

Table 9: E. coli. Test of open restaurant food (N=5)

E. coli. test of open restaurant food									
Charact eristics	Dumki	Patuak hali	Kua kata	Mean	Character istics	Dumki	Patuak hali	Kua kata	Mean
Food item: Rice (%)					Food item: Khichuri (%)				
-(ve)	60	60	40	53.33	- (ve)	80	80	80	80
No	40	40	60	46.67	No	20	20	20	20
Food item: Fish (%)					Food item: Biriani (%)				
-(ve)	80	60	80	73.33	- (ve)	40	40	60	46.67
No	20	40	20	26.67	No	60	60	40	53.33
Food item: Egg curry (%)					Food item: Vegetables (%)				

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- ve)	0	40	0	13.33
No	100	60	100	86.67
Food item: Meat (%)				
- ve)	60	60	60	60
No	40	40	40	40
Food item: Washing water (%)				
- ve)	100	100	80	93.33
No	0	0	20	6.67
Food item: Bread (%)				
- ve)	60	60	80	66.67
No	40	40	20	33.33

- (ve)	80	60	60	66.67
No	20	20	40	33.33
Food item: Drinking Water (%)				
- (ve)	60	40	60	53.33
No	40	60	40	46.67
Food item: Dal Charchori (%)				
- (ve)	100	100	100	100
No	0	0	0	0
Food item: Potato varta (%)				
- (ve)	80	80	80	80
No	20	20	20	20

Maximum (83%) of the sample bears gram-negative bacteria and Salmonella.

Table 10: Study of a positive sample of Salmonella

Name of food	Sample size	*E.coli.*(- ve)	Percent (%)	*Salmonella* (+ ve)	Percent (%)
Open Restaurant food sample	180	32	17.78	25	13.89

IV. Discussion

Maximum vendors (31%) were between 21-40 years of age, which supports the data of the Bangkok where the average age is 36 years (FAO, 1994). Maximum food vendors 95% were male. But it is extremely opposite to other countries and cities like Bangkok where the female is 69.3% and Honduras, Indonesia, and Nigeria where percentage increases to 90% and above (FAO, 1990).

In Bangladesh, about 25% of the men received help from their wives and 12% employed female helpers (Bhat & Waghray, 2000). In contrast, other countries (e.g. Nigeria, Ghana, Uganda, and the Kenya) including Botswana, the majority of vendors are women who balance the income-generating opportunities of street vending with traditional household and child care duties (Mwangi, 2002).

In Mexico City (Muòoz de Chavez et al, 2000) found that men and women divided their tasks and responsibilities. Women cooked the food to be sold later in the day, while the men were responsible for buying all that was necessary for preparation of the food. Women worked an early shift in the stall, until about noon, when the men took over and stayed late. Men were responsible for cleaning the stalls, while women washed the utensils and dishes at home.

About 72.22% food vendors aged between 21-40 years with a mean age of years. Bhat and Waghray (2000) reported that the average age of the vendors in Asian countries were 20-45 years. Studies conducted in most Latin American Countries showed a similar trend compared to the one in Asian countries. In Jamaica however the age of vendors ranged from 14 to 78 years, with a mean age of 35.5years and female vendors being older compared to their male counterparts (Bhat and Waghray, 2000)

A majority of the vendors displayed their foods in baskets/trays, bowl and shelves in survey area while vendors used showcase for display their food in Patuakhali and Kuakata areas.

The storage conditions were poor. The majority of the cases food stored at room temperature in plastic containers. The uncooked food products are left at ambient temperature for long periods.

Majority of the handler used stored water for cleaning utensils (68.89%) followed by followed by pond and river water (15%). Majority of handler used plate (27.78%) followed by paper & polythene (49.45%) as a serving media. Tube well water used 100% as drinking water. It found that many vendors simply re-used the water, especially for cleaning utensils equipments and dishes due to difficulties in obtaining clean portable water (FAO and PAHO, l985).

Hygiene during handling and cooking of street foods observed. It found that vendors did not wash fresh foods properly. Vendors did not wash their hands and utensils only once because they had not enough water. None of the cases, the vendors and the assistants did practice good personal hygiene; uniforms and aprons were not in use. Hanashiro et. al. (2005) examined microbiological quality of selected street foods from a restricted area of Sao Paulo city, Brazil and observed that personal hygiene of vendors during handling and cooking is very important as it causes serious health hazards to the consumers.

There was also hardly any inspection of the shops from the municipal or other appropriate

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authorities. This is similar to most developing countries which have no specific legislation or control systems for street food vending (Jayasuriya, 1994).

The most important finding of this study was the correlation between the socio- economic results regarding the hygiene practices of street vendors and the findings of the microbiological survey. The results of 5 other studies done among street food vendors in South Africa had similar conclusions (Mosupye FM et.al.2000).

This was a qualitative study of bacterial contamination for E. coli and Salmonella. Almost half (52.33%) of the samples contaminated where 17.67% positive for E. coli. and, 15% for salmonella in Open restaurant food. The positive case for Open restaurant food sample was 30 out of 180 sample (16.67%). The positive for Open restaurant foods sample was 35 out of 180 samples (19.44%) for salmonella.

V. Conclusion

Open restaurant foods have become a big part of the present-day urban scenario in many countries. The hygienic practices in question included food preparation, handling of utensils; a place for food preparation, personal hygiene, and methods of storing cooked food. Due to a lack of proper knowledge and guidance on food vending, vendors prepared it in explicitly unhygienic and unsanitary conditions. Improving the safety of food in any developing country is a great challenge. One of the major driving forces towards efforts to improve food vending is the contribution. As food vendors are doing their business without having a license, therefore, vendors are given clear legal status, so they can claim their entitlements to pursue their livelihoods. The vending foods contaminated with E. coli and Salmonella that causes a major health problem.

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Prevalence and Associated Risk Factor of Intestinal Parasitic Infection between Marginalized and Non- marginalized People in AL-Turbah City. Taiz Governorate, Yemen

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Abstract- The infection of individuals due to their behavior and extent of health education. In marginalized people often live in crowded conditions, limited sanitation, and personal hygiene is lack. they suffer a lack of health education and low income.

Aim: This study was carried out to determine the prevalence of intestinal parasites at marginalized people (Al-akhdam-The neglected group) and other people in different areas in Al - Turbah city, and the relationship between parasites infection and race, age, sex, Family size, educational level, water source and type of job.

Methods: The study was carried out from areas in Al-Turbah city, during March to December 2016.

Keywords: marginalized people, parasites, al -turbah city, yemen.

GJMR-C Classification: NLMC Code: WC 695



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Prevalence and Associated Risk Factor of Intestinal Parasitic Infection between Marginalized and Non- marginalized People in AL-Turbah City. Taiz Governorate, Yemen

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Abstract- The infection of individuals due to their behavior and extent of health education. In marginalized people often live in crowded conditions, limited sanitation, and personal hygiene is lack. they suffer a lack of health education and low income.

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Methods: The study was carried out from areas in Al-Turbah city, during March to December 2016.

Methodology: cross-sectional descriptive and comparative study a total of 322 cases were randomly collected, aged between 5 and 45 years were examined using examined by direct wet mount technique and formalin- ether concentration technique, the questionnaire data was used for determining the correlation between parasites infection and other factors such as race, age, sex, Family size, educational level, water source and type of job.

Statistical analysis: The data analyzed by SPSS program.

Results: The study found that 124 cases of parasites infection are positive for marginal people from a total of 153 and 89 cases are positive for non-marginal (other people)from a total of 169 specimens were collected from areas in Al-Turbah city. Also found from 124 +ve in marginal people 60 cases (78.9%) are mal and 64 cases (64%) female are positive while found from 89 cases in other people 44 cases (51.2%) are male and 45 cases (54.2%) are female. The results of the study indicate that there was highly significant associated between positive of parasites infection and marginal people (p=0, 01) and there significant differences between age (p=0.04), illiterate (p=0.05) and secondary school (p=0.05), while there was no significant associated between positive of parasites infection and other factors. Infected by parasites infection in this study there is a relation between parasites infection and marginalized people.

Keywords: marginalized people, parasites, al -turbah city, yemen.

I. Introduction

An intestinal parasitic infection (IPI) caused by intestinal helminthes and protozoan parasites are one of the most prevalent infections in humans residing in developing countries [1]. It is estimated that 3.5 billion people are affected, the majority being children [2]. The happening and prevalence of intestinal parasitic infections varies in countries due to environmental, social and geographical factors [3]. high prevalence of intestinal parasitic infections in human are positively correlated with poverty and poor personal hygiene, lack of safe water supply and contamination of the environment by human excreta and animal wastes [4]. Morbidity and mortality due to intestinal parasitic infections are usually more pronounced in children compared to adults due to their higher nutritional requirements and less mature immune systems [5]. Intestinal protozoan infections are endemic worldwide. In developed countries the prevalence of human intestinal parasitic protozoan infection is estimated to be between 1-7%, but it may be as high as 50% in developing countries. All age groups are equally affected during epidemics, but both subclinical infection and clinical disease are more common in children in endemic areas. Outbreaks occur regularly in childcare facilities. Immuno-compromised individuals are also more commonly affected than members of the general population [6].

II. Methods

The study conducted in the Faculty of Medical Sciences, Taiz University, Taiz city, Yemen. From March to December 2016, 322 fecal samples from 153 marginal people and 169 non-marginal people (other people) selected in Al- Turbah city, Taiz governorate,

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aged between 5 and 45 years were tasted. As a standard protocol, after reached the samples in the laboratory, the fecal specimens also processed by the formalin-ether concentration technique.

Were examined for detection the present of ova, larva, cyst, and trophozoites, using Wet mount method with both saline and iodine were prepared within 2 h of sample collection [7]. Stool samples were also processed by the formalin-ether concentration technique, Each wet-mount method and formalin-ether concentration technique were examined by team researchers independently and findings were cross-checked.

III. Statistical Analysis

Data was presented in form of tables by using SPSS, after those demographic data and other factors were collected in a standard questionnaire. Next, findings of positive intestinal parasites were analyzed data was presented in form of tables by using SPSS.

IV. Results

The study results illustrated in Table1 to Table9. The prevalence of intestinal parasites in marginalized were 81% while, in the other people were (52.7%). There was significant association between marginalized people and non-marginalized (OR= 3.84 times, P=0.01), and shows statistically significant among the illiterate (p=0.05, OR=OR=1.69), secondary school (p=0.05, OR=OR=0.55, while there was no significant association between positive of marginalized and non-marginalized people and others factors studied.

V. Discussion

Intestinal parasitic infections of humans are important threats to healthy living in developing countries [8]. These infections are usually associated with poor sanitary habits, lack of access to safe water and improper hygiene. The degree of each factor and prevalence of infections varies from one region to the non- marginalized [9].

In our result, table (1) shows that the marginalized was much higher infected by IPIs [124/153(81%] compared to non-marginalized people [89/169(52.7%)] and was statistically significant (p .value=0.01). These variations in prevalence of IPIs among two race might be due to the majority of marginalized do not care for education, poor sanitary disposal of sewage system, poverty of personal hygiene, also the randomly, crowdedness, and type of job play role in the transmission of parasites where the majorities of marginalized worker in the refuse collector and clean worker …ect.

Also, the results showed were three species of protozoa were found in the population studied, (*E. histolytica* was the most frequent intestinal protozoan infection in marginalized and non-marginal- -ized was (41.2% and 29.6%) respectively. followed by *E. Coli* 67(20.8%), were in marginalized and non-marginalize (29.4%), (13%) respectively, *G. Lamblia* 39(12.1%) were marginalized and non- marginalized people (11.1%), (0.6%) respectively. There high significant between *E. histolytica* and marginalized people. As in table (2). In contrast, other studies conducted in Yemen found that the most predominant parasite was *G. lamblia* [10].

The results in table (3) which showed the type of parasites infection, find the rate prevalence of H. nana10.5%, 0.6%, *A. lambricoides*3.6%, 3.6%, *S. mansoni* 4.6%, 0.65, *Teania. Spp*2.6%, 0.0%, *E. vermecularis* 0.7%, 0.6% in Marginalized, Non-marg. respectively. There are only significant among *H. nana and T.spp*. Parasites and marginal people. Our results agree with the results in Soudia Arabia, Who confirmed H. nana was dominant followed by A. lambricoides, S. mansoni and E. vermicularis [11]. In table (4) The majorities of the positive cases of IPI among 213/322 were single infections among race[50.6] with p=0.02 and OR=1.99 and was [91/124(59.5%) , 72/89(42.6%)] , in marginalized and non- marginalized at respectively, followed by double infection was [14.6] with p =0.01 ,followed by triple infection that was =0.9 with 0R=2.23.and p=0.5052and was [(1.3),1(0.6)] in the marginalized and non - marginalized at respectively. It is clear that double infection and triple infection because of the highly exposure to the infection sources such as contaminated food or water [12].

From the table (5) in our result shows there no significant between parasites infection and gender (p=0.46) the rate of infection was slightly higher in females than males the modes of transmission of the parasites, study population and the methods used probable attribute to this observed difference in detections of various parasites, a recent study in Cameroon found that the higher prevalence of human intestinal protozoan in females was attributed to the fact that women usually eat unwashed fruits and vegetables or un boiled salads which may be contaminated with protozoan cysts [13], also other study showed Female participants the highest infection rate (41.0%), followed closely by male participants (38.6%) [14] While, the study detect significant association between the occurrence intestinal parasitic infection and age group 5-15 [94/129(72.9%)] when compared to age group 16-45 [119/193(61.7%)] (p=04) and OR=1.67 ,which indicated that younger children are more exposed since the usually play in the open fields and eat food without washing hands .thus, as age increases (16-45yr) the prevalence of parasitic infection decreases possibly due to improved personal hygiene and reduced contact with soil (These findings are in agreement with that reported by [15].

Table (6) in our result shows no significant between IPI and family size, but the IPIs was related to

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family size ≥6 person [115/152 (75.7) (p>0, 43, OR=1.22 times) when compared to family size ≤5 person (p=0.43 and OR=0.82time). Studies of [16]. supported our study, large families are more susceptible to parasitic infections than small families, because of the crowding in houses leading to participation in food tools, clothes and bed finally these lead to poor personal hygiene thus, increasing the infection.

Table (7) shows statistically significant among the illiterate (p=0.05, OR=OR=1.69), secondary school (p=0.05, OR=OR=0.55) and IPI. 60/87(69%), IPI was related to primary school (p=more than 0.05) when compared to high school (p=more than 0.05) and diploma (P. value more than 0.05), our results similar of study of [17].their illiterate showed high significant than other levels of education.

Table (8) shows relationship between parasites infection and source of water in marginal and non-marginal people, the rate of prevalence of intestinal parasites was 83.9%, 51.6% in the protect water in marginal, and 76.6%,66.7% in Non-protect water in marginal, non-marginal respectively. according to study of [17]it was significant between parasites infection and source of water, this study disagree with our results.

Table (9) shows association between IPI and kind of occupation there high significant among parasites infection and workers, while there was no significant associated between positive of parasites infection and others occupations studied.

Level especially in primary and secondary schools' students about the intestinal parasite infections, sources and routes of parasites transmission, some students frequently eating street cooked foods that may be contaminated or not properly cooked could attributed to the infections by intestinal parasites some Childs like working without shoes which could assists the infections by intestinal parasites especially soil transmitted parasites, food that may increase the infections by intestinal parasites in housewives who considered the most connecting with water compared to other of the family members ,agriculture working and the connection with animal and their wastes may although responsible for prevalence of IPIs among housewives, the dealing with wastes and low personal hygiene with culpa hand washing before eating practices mentioned among refuse collectors, that make them more prone to the infection by intestinal parasites, the present findings showed that those who do not practice proper hand washing before eating was at two fold higher risk of acquiring E. histolytica /dispar infection[18].

VI. Conclusion

The study highlights the high prevalence of parasites infection between marginal people and non-marginal people in Yemen. The clinicians in Yemen need to be aware that parasites are a potential cause of endemic specially in children.

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Conflict of interest

"No conflict of interest associated with this work".

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Tables Legends

Table 1: The Prevalence of intestinal parasites among 153 marginalized and 169 other people in Al-Turbah city- Yemen

Race	Number	Percentage%	OR	$\chi 2$	P
Marginalized	124	81.0	3.84	28.89	0.01
Non- Marginalized	89	52.7	0.26	28.89	0.01

Table 2: The prevalence of intestinal protozoa parasites (IPI) between 153 marginalized and 169 non -marginalized (other people)

	Marginalized		Non-marg.				
Type of parasites Infection	Number	Percentage%	Number	Percentage%	Total	OR	P
E.histolytica	63	41.2	50	29.6	113(35.1%)	1.66	0.03
E.coli	45	29.4	22	13.0	113(35.1%)	2.78	0.01
G.lamblia	17	11.1	1	0.6	39(12.1%)	0.84	0.60

Table 3: The prevalence of intestinal helminthes parasites (IPI) between 153 marginalized people and 169 non- marginalized (other people)

Type of parasites Infection	Marginalized		Non-marg.				
	Number	Percentage%	Number	Percentage%	Total	OR	P
H. nana	16	10.5	1	0.6	17(5.3%)	1.9	0.01
A. lambricoides	6	3.6	6	3.6	12(3.7%)	1.1	0.8
S. mansoni	7	4.6	1	0.6	8(2.5%)	0.85	0.2
Teania. Spp	4	2.6	0	0.0	4(1.2%)	2.1	0.03
E. vermecularis	1	0.7	1	0.6	2(0.6)	1.1	0.9

Table 4: Type of infection by IPI in153 marginalized and169 non - marginalized

Type of Infection	Marginalized		Non-marg.				
	Number	Percentage%	Number	Percentage%	Total	OR	P
Single infection	91	59.5	72	42.6	(163)50.6%	1.98	0.02
Double infection	31	20.3	16	9.5	(47)14.6%	2.4	0.03
Triple infection	2	1.3	1	0.6	(3) 0.9	2.2	0.5

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Table 5: The prevalence rate of intestinal parasites infection (IPI) in different gender and age of tested marg. and other people

Characters	Positive Marg.		Positive Non-Marg.		Total	OR	χ2	P
Sex	N	%	No	%				
Male	60/76	78.9	44/86	51.2	104/162(64.2%)	0.84	0.56	0.46
Female	64/77	83.1	45/83	54.2	109/160(68.1%)	1.2	0.56	0.46
Age groups								
5-15 years	47/59	79.7	47/70	67.1	94/129(72.9%)	1.67	4.34	0.04
16-45 years	77/94	81.9	42/99	42.4	119/193(61.7%)	0.6	4.34	0.04

Table 6: The association between IPI and family size for tested marg. and other people

Family size	Positive Marg.		Positive Non-Marg.		Total	OR	χ2	P
	N	%	No	%				
≤5 person	37/52	71	61/118	51.7	98/170(57.6%)	0.82	0.63	0.43
≥6 person	87/101	86.1	28/51	54.9	115/152 (75.7%)	1.22	0.63	0.43

Table 7: The association between IPI and educational levels for tested marg and other people

Educational level	Positive Marg.		Positive Non-Marg.		Total	OR	χ2	P
	N	%	N	%				
Illiterate	59/78	75.6	17/25	68	76/103(73.8%)	1.69	3.95	0.05
Primary school	32/34	94.1	28/53	52.8	60/87(69%)	1.19	0.42	0.52
Secondary school	13/20	65	17/35	48.6	30/55(54.5%)	0.55	3.99	0.05
High school	8/13	61.5	8/18	44.4	16/31(51.6%)	1.08	0.04	0.84
Diploma and above	5/8	62.5	19/38	50	24/46(52.2%)	0.62	2.22	0.14

Table 8: Association between IPI and source of water for marginalized and non -marginalized people

Type of water	Positive Marg.		Positive Non-Marg.		OR	χ2	P
	N	%	No	%			
protected	78/93	83.9	81/157	51.6	0.58	3.24	0.07
Non protected	36/47	76.6	4/6	66.7	1.71	2.46	0.12

Table 9: Association between IPI and type of occupation in marginalized and non- marginalized people

Type of job	Positive Marg.		Positive Non-Marg.		Total	OR	χ2	P
	N	%	No	%				
Students	41/46	89	60/105	57	101/151(66.9%)	1.06	0.07	0.79
Teachers	1/2	50	1/3	33.3	2/5(40%)	0.34	1.55	0.21
Workers	16/22	72.7	3/18		19/40(47.7%)	0.41	7.92	0.01
House wife	21/22	95.5	11/12	16.7	32/44(72%)	1.43	0.99	0.3
Accountant	-		2/2		2/2	0.66	1.03	0.3
Disabled	2/2		-		2/2	0.66	1.03	0.3
Refuse collector	18/24	75	-		18/24	1.59	0.91	0.30
Martial	1/1		-		1/1	0.66	0.51	0.4
Unemployed	1/3	33.3	-		1/3(33.3%)	0.25	1.46	0.23

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Clinicopathologic Profile of Gastric Endoscopic Biopsies in Port Harcourt, Nigeria

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Abstract- *Background:* Histological diagnoses of endoscopic biopsies are keys to improved outcomes of patient management; hence endoscopy and histological evaluation of the associated specimens are age-long practices globally, but this practice is just evolving in Port Harcourt.

Aim: To characterize the clinico-pathologic features of gastric endoscopic biopsies seen in Port Harcourt.

Methodology: This is a retrospective study of gastric endoscopic biopsies seen in a private pathology referral practice in Port Harcourt between 1st January 2014 and 31st December 2018. The relevant clinical and demographic information were obtained from patients' laboratory request forms. The gastric biopsies were fixed in 10% neutral buffered formalin, processed, and stained with hematoxylin and eosin for general morphology. Modified Giemsa stain was used for Helicobacter pylori identification. The slides were reported using the updated Sydney classification.

Keywords: *gastric biopsy, gastritis, helicobacter pylori, chronic atrophic gastritis (CAG), dyspepsia.*

GJMR-C Classification: *NLMC Code: QY 4*



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Clinicopathologic Profile of Gastric Endoscopic Biopsies in Port Harcourt, Nigeria

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Results: A total of 227 cases were seen. The youngest patient was a seven-year- old female and, the oldest a 99-year-old male, mean age was 48.46 ±16.10. The male to female ratio was 1.1:1. Age group 40-49 years accounted for most cases (25.6%). The main symptom at presentation was epigastric pain (40.5%), distantly followed by a feeling of indigestion (8.4%).The main histological diagnoses were chronic gastritis (62.6%) and chronic active gastritis (22.5%). Malignant lesions were seen in 13.5% of cases. H pylori were seen in 31% of cases. Chronic atrophic gastritis (CAG) was seen in 4.1%, intestinal metaplasia (IM); 4.6%, and dysplasia 7.1%.

Conclusion: Gastric carcinoma is not rare in our environment.

Keywords: gastric biopsy, gastritis, helicobacter pylori, chronic atrophic gastritis (CAG), dyspepsia.

I. Introduction

Common gastric lesions are gastritis and its complications (gastric ulcers, mucosal atrophy (MA), intestinal metaplasia (IM) and dysplasia), and gastric polyps and tumors[1]. Gastritis (which could be active or chronic) is a mucosal inflammatory process, which could be asymptomatic or symptomatic. Common symptoms of gastritis include: / variable degrees of epigastric pain, nausea, vomiting, hematemesis, melena stool, and rarely massive blood loss.[1]Based on pathogenesis; there are two broad types of gastritis - gastritis associated with Helicobacter pylori (H pylori) infection and gastritis without H pylori infection. In the latter group are autoimmune gastritis, granulomatous gastritis, chemically induced reactive gastritis, ex-H pylori gastritis, Crohns gastritis, eosinophilic gastritis, lymphocytic gastritis, collagenous gastritis and Helicobacter heilmanniigastritis.[2] Most of the non-H pylori-associated gastritis are of unknown etiology or due to infection with opportunistic organisms, the use of non steroidal anti-inflammatory drugs (NSAIDs) or auto immunereactions.[2,3]H pylori have been identified globally as the main cause of chronic gastritis (CG).[2-5] H pylori infection is usually acquired during childhood and is mostly associated with poor socio-economic living conditions.[4-6]The global prevalence of H. pylori infection in humans is estimated to be 50%, with a prevalence of about 70-90% in developing countries and 20-30% in developed countries. Developing countries especially in Sub Saharan Africa, and some parts of Asia have the highest prevalence, and it is said to be endemic in such countries.[5,7-9] The sequelae of H pylori CG may include: (MA, IM, dysplasia and adenocarcinoma) is well documented, but fortunately, in SSA the incidence rate of gastric adenocarcinoma is reportedly low, despite the high prevalence rate which has led to the use of the terminology "African Enigma".[7] Due to the wide prevalence in SSA, at times H pylori is seen in persons with normal gastric endoscopic pictures.[10]Diagnostic endoscopy, though an invasive procedure has been proven to be a simple, safe, and well-tolerated procedure.[11] Histologic evaluation of the biopsies obtained at gastric endoscopies is the gold standard for the investigation of patients with complaints of dyspepsia. The histopathology results obtained give the definitive diagnosis that determines the treatment options and prognosis.[12]This study shows the histologic pattern of gastric endoscopic biopsies seen in a private referral pathology diagnostic center in Port Harcourt.

II. Materials and Methods

This is a retrospective case-controlled study of gastric endoscopic biopsies evaluated by the authors in a Port Harcourt based referral pathology diagnostic center – Cedar Pathology and Forensic Services Ltd.

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Port Harcourt is the capital of Rivers state of Nigeria and the epicenter of the oil-rich Niger Delta region, noted for the widely acclaimed environmental oil pollution that resulted from the poorly regulated activities of oil and gas companies operating in the area. Gastric endoscopy biopsy specimens are received from different private and general gastroenterology practitioners in Port Harcourt. Endoscopic biopsies processed in the center within a five years- 1st January 2014 to 31stDecember 2018 were selected for the study. For each case, the relevant clinical information and demographic data were obtained from the laboratory request forms of the patients. Following endoscopy, biopsy specimens were fixed in 10% neutral buffered formalin and processed with automated tissue processor and embedded in paraffin wax with special caution taken to orient the tissue appropriately. The obtained paraffin-embedded tissue blocks were serially sectioned into 2-4μm thick ribbons that were subsequently floated onto clean, transparent glass slides. The mounted sections were then stained with hematoxylin and eosin, for general light microscopic evaluation, while modified Giemsa-stained sections were used to check for the presence of Helicobacter pylori. The latter appears as light blue to grayish colored short rods in the luminal mucin or epithelial crypts. The slides were read by the authors using the Updated Sydney classification system[2]. Due consideration to adequacy of the tissue section based on the presence of components of the surface epithelium and muscular is mucosa was given in the biopsy reporting. For each case, the surface and glandular epithelial cells were assessed for mucin depletion, nuclear pseudo stratification with or without pencillate appearance and hyperchromasia, increased mitotic figures as well as a loss of polarity. These features, when present, depicted dysplasia. Gastric glandular atrophy was evaluated for, based on the adequacy of glands in terms of number, distribution, and architecture, while neutrophilic activity was assessed on the presence of intraepithelial neutrophils. The presence of intestinal epithelium with mucin-producing goblet cells was also sought to ascertain intestinal metaplasia. The data were analyzed using the statistical package for social sciences (SPSS) version 20.

Three cases without stated age and sex were excluded, while 10 cases without stated ages only and 2 cases without stated sexes only were included.

III. Results

A total of 227 cases were seen. The youngest patient was a seven-year-old female, and the oldest a99-year-old male, mean age was 48.46 ±16.10. The male to female ratio was 1.1:1. Table 1, shows the age and sex distribution of cases, with age group 40-49 years accounting for most cases (25.6%) and age group 0-9 years accounting for the least. In 10 patients, the ages were not stated, while in 2 patients, their sexes were not stated, however in all 227 cases, the diagnoses were mentioned.

Table 2 shows the main symptom at presentation. Epigastric pain was the commonest indication for endoscopy (40.5%), distantly followed by the feeling of indigestion (8.4%).

Chronic gastritis (62.6%) and chronic active gastritis (22.5%) were the main histological diagnoses, as shown in table 3.

Table 4 shows the different complications of gastritis seen in the series, and the frequency of detection of H pylori in the cases seen. H pylori were seen in 26.9% of cases. A comparison of the index study with some similar studies from Nigeria, other African countries, Asia and there public of Georgia is shown in Table 5.

Table 1: Age and sex distribution of cases

Age group	Male	Female	Total	Percentage (%)
0-9	-	1	1	0.5
10-19	3	-	3	1.3
20-29	8	9	17	7.9
30-39	29	15	44	20.5
40-49	31	27	58	27
50-59	16	19	35	16.3
60-69	11	22	33	15.3
70-79	11	6	17	7.9
80-89	4	2	6	2.8
≥ 90	1	-	1	0.5
Total	114	101	215	100

Table 2: Symptoms of patients at presentation (indications for endoscopy)

Symptom	Frequency	Percentage (%)
Epigastric pain	92	40.5
Feeling of indigestion	19	8.4
Massive rectal bleeding with upper abdominal pain	10	4.4
Dysphagia	7	3.1
Epigastric pain with anaemia and weight loss	5	2.5
Hematemesis	5	2.2
Persistent vomiting	5	2.2
Melena stool	4	1.8
Heart burn	4	1.8
Abdominal pain with weight loss	4	1.8
Others	33	14.5
Not stated	44	19.4

Others include 3 cases each of the following: Easy satiety, abdominal discomfort, abdominal mass, a combination of epigastric pain and retrosternal pain, epigastric pain with anemia and weight loss, dyspepsia

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with weight loss. Others also include 2 cases each of the following symptoms: excessive belching, persistent throat discomfort, regurgitation, and a combination of persistent vomiting and abdominal pain. A case of each of the following symptoms was also seen: upper abdominal pain with swelling and constipation, hematemes is with weight loss, epigastric pain with blood in saliva, heart burn with dysphagia and feeling of indigestion, feeling of indigestion with throat pain and recurrent vomiting.

Table 3: Pattern of histologic diagnoses

Diagnosis	Frequency	Percentage
Chronic gastritis	142	62.6
Chronic active gastritis	51	22.5
Hyperplastic polyp	2	0.9
Chemical gastritis	1	0.4
Adenocarcinoma	28	12.3
Squamous cell carcinoma	1	0.4
Carcinoid tumor	1	0.4
Maltoma	1	0.4
Total	227	100

Table 4: Frequency of H pylori and complications of gastritis

Histologic features	Chronic gastritis	Chronic-active gastritis	Total (%)
H Pylori	39	22	61 (26.9)
Atrophy	7	1	8 (3.5)
IM	9	-	9(4)
IM with dysplasia	12	2	14(6.2)

IM = Intestinal Metaplasia

Table 5: Comparison of the index study with similar studies from Nigeria, Africa, and Asia

Para Meters	Index study	Jos Nig[13]	Ibadan Nig[10]	Ilorin Nig[14]	Nair obi; Kenya[15]	Maputo; Mozam Bique[16]	Lalitpur; Nepal[17]	Rawal Pindi; Pakistan[18]	Srinager; India[19]	Georgia[20]
Duration of study (months)	66	7	11	6	4	10	6	24	26	36
No of cases	227	100	86	125	71	109	1020	787	196	90
M:F ratio	1.1:1	1:1	1:1.2	1:1.6	1:1	-	1:1.2	6:1	1.9:1	1.1:1
Mean age yrs	48.46	39.6	49.19	35.3	43	37	41.7	-	-	62
CG (%)	62.6	95	64	-	-	90.8	57.3	85.9	31.5	87
H pylori Presence (%)	26.9	79	52.35	-	91	62.4	68.1	70	20.5	72
Activity (%)	22.5	83	-	-	-	-	42.1	68.8	-	90
Atrophy (%)	3.5	38	-	-	57	8.3	2.4	10	-	16
IM (%)	4	28	-	-	11	8.3	3	10	-	35
IM with dysplasia	6.2	-	-	-	-	-	-	-	-	-
Cancer (%)	13.5	3	3.5	-	-	0.9	0.5	5.7	35.4	16

Nig = Nigeria

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IV. Discussion

This study is timely considering the paucity of gastric biopsy-based studies in Port Harcourt. A decade ago, endoscopic biopsies were not carried out in Port Harcourt largely because of a lack of technical expertise. Besides, generally across the globe, gastritis was at a time considered a more or less useful histological finding but not a disease and therefore the need for biopsy- based diagnostic workup of patients was questioned until the discovery of *Helicobacter pylori* by Warren and Marshall in 1983[13]. This erstwhile relegation of biopsy-based diagnosis of gastritis may have contributed to the very slow progress in the training and development of endoscopy skills by physicians in our environment. This, in turn, may explain the slow pace of endoscopy practice and the virtual absence of histological evaluation of endoscopic specimens in our environment. This study portends hope and a bright future for the practice of gastroenterology in Port Harcourt as endoscopies have come to stay.

The updated Sydney system of classification of gastritis, which was worked out at the *H pylori* congress of 1994stipulated that two biopsies each from the corpus and antrum, and another from incisuraangularis be taken during endoscopy, to minimize sampling errors. However, the compliance by our gastroenterology physicians to the tenets of the updated Sydney classification is lacking in the area of strict topography based biopsy. Biopsy specimens received in our Pathology laboratory often come as one or two tiny piece(s) of tissues, lacking in topographic labeling. This practice needs to be improved upon considering the importance of topographic information in the classification of gastritis. Similarly, most of the studies available to us and cited in this work used the updated Sydney classification in their methodology, but a critical review shows that they did not comply strictly with the set standards especially in the area of taking multiple biopsies and topographically identifying them. Most of the studies were based on specimens taken from the gastric antrum only [10,12,15,17,19,21]. Gastroenterologists should strive to obtain specimens from the various topographic sites recommended by the updated Sydney classification scheme.

The mean age of 48.46 years noted in this study is within the mean age range of 35.3 and 49.1 years observed in similar previous African and Asian studies but less than 62 years observed in the Republic of Georgia. Symptomatic manifestation of CG usually arises in later decades of life, despite being acquired in childhood, and tend to arise in subjects with advanced stages of the lesion[22,23]. The implication of the age involvement is that patients are at the prime of their productive family, economic and social life. Thus the associated morbidity will constitute some truncation of productivity with negative socioeconomic consequences to the families and the nation at large.

We observed a slight male preponderance which is different from other Nigerian studies that observed slight female preponderance.[10,15] Studies from India and Pakistan reported significant male preponderance in their series, though no reasons were given.

Chronic gastritis was the predominant histologic diagnosis in this series, which is similar to observations in other studies except in Srinagar India, where gastric hyper plastic polyps were the commonest[10, 12-21]. There were only two cases of hyper plastic polyp in our case. The relatively low rate of chronic active gastritis may be due to antibiotic abuse, which is rife in our environment. Antibiotics, especially the broad-spectrum ones commonly abused by Nigerians, cause the disappearance of neutrophil infiltrate with the persistence of other chronic inflammatory cells like lymphocytes and plasma cells[35,36].

H pylori positivity or presence in the index study is low compared to other studies and this may be due to recent intake of proton pump inhibitors (in an attempt to take anti-ulcer drugs which are easily purchased off the counter in Nigeria), and some level of subjectivity of evaluating pathologists in the recognition and detection of H pylori in tissue specimens. Also, inadequate sampling or sampling errors or taking of specimens only from the antrum, which has been proven to give a low yield of H pylori compared to corpus, especially after treatment, may be accountable.[12,19,24]Other factors include the size of the gastric biopsies, method of staining, and level of experience of the examing pathologist.[25]Gastric biopsies from complete IM sites are also known not to contain H pylori.[26]False positive H pylori CG can also occur when the equipment is not properly cleaned and used on another patient.[27]Other non-histologic ways to confirm the presence of H pylori are the use of Polymer Chain Reaction (PCR), rapid urease test, serological detection of an anti H pylori antibody, 13Carbon-hydrogen urea breath test, or stool antigen testing.[9,10,17,28]Unfortunately these other investigations are expensive and are not routinely available in developing countries like in the setting where the index study was conducted.[9]Antibiotic abuse is also a possible contributing factor to the reduced rate of H.pylori positivity in this work [35].

Chronic atrophic gastritis (CAG) was seen in only 3.5% of cases. This is less than the findings in previous studies but greater than 2.4% observed in Lalitpur; Nepal, while studies in Ibadan and Ilorin Nigeria, did not mention CAG [10,12-20]. CAG is usually a sequelae of a life-long and aggressive inflammation resulting in destruction of gastric mucosa with time.[4] With the passage of time, CAG leads to dysfunction of stomach mucosa, which ultimately manifests as acid-free stomach. Severe CAG and acid-free stomach are

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the highest known risk factors for gastric cancer.[4]The chances of gastric cancer developing due to CGrises exponentially with the progression of H. pylori gastritis from a non-atrophic gastritis form to CAG form[29].

IM occurs as a result of the replacement of the lost gastric mucosal glands due to atrophy. IM comprises of immature small or large intestinal type of epithelium[4]. Although patients with IM run a risk of gastric cancer, it is low compared to adenocarcinoma arising in patients with Barrett esophagus[30]. IM in this series is only greater than the rate seen in Nepal but less than rates observed in Jos, North Central Nigeria, Kenya, Mozambique, Pakistan, and Georgia.[14,16-19,21]

Low-grade dysplasia was seen in 7.1% of cases and in association with IM. The other studies available to us did not make mention of dysplasia in their findings[10,13-21]. Looking out for dysplastic features in endoscopy biopsy is fundamental as its diagnosis may portend adjustment inpatients' treatment protocol, including undertaking surgical resection in high-grade dysplasia.[31]Gastric IM is linked to gastric dysplasia and research has shown that in up to 20% of individuals with IM, concurrent dysplasia is present[32.] Gastric epithelial dysplasia is associated with some risk of gastric cancer development. Since IM and dysplasia are individual risk factors for carcinoma development, the coexistence of both will most likely have a multiplier effect in carcinogenesis [33]. Thus our patients would have been followed up, which unfortunately did not happen. Surgeons and pathologists need closer synergy for optimization of patient treatment outcomes, including instituting patient follow up where necessary as in this case.

Compared to previous Nigerian and African studies, this study, unfortunately, observed a relatively high rate of gastric malignant lesions. The reason/s for this cannot be readily explained. Cancer is the most serious disease linked to H pylori gastritis[34]. There will be the need for a population based study in Port Harcourt to know if the so called 'African Enigma" (high rate of H pylori infection and low rate of gastric cancer in Africans) does not apply in this environment and to know factors responsible for a higher rate of gastric cancers.

The major limitations of this study include: the relatively small sample size (in respect to the long duration of study) and non-availability or use of other ancillary tests that could help in determining the presence of H pylori organisms. Also, the standard five specimen's collection from different parts of the stomach was not routinely done.

V. Conclusion

The histologic patterns of gastric endoscopic biopsies seen in Port Harcourt is different from findings in other parts of Nigeria, especially concerning the low prevalence of H. pylori in tissue specimens and the relatively high rate of gastric carcinomas observed. The current efforts at performing endoscopic biopsies and histologically examining them needs not only to be sustained but improved upon, for better patient treatment outcomes.

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A major lynchpin of research work for the writing of research papers is the keyword search, which one will employ to find both library and internet resources. Up to eleven keywords or very brief phrases have to be given to help data retrieval, mining, and indexing.

One must be persistent and creative in using keywords. An effective keyword search requires a strategy: planning of a list of possible keywords and phrases to try.

Choice of the main keywords is the first tool of writing a research paper. Research paper writing is an art. Keyword search should be as strategic as possible.

One should start brainstorming lists of potential keywords before even beginning searching. Think about the most important concepts related to research work. Ask, “What words would a source have to include to be truly valuable in a research paper?” Then consider synonyms for the important words.

It may take the discovery of only one important paper to steer in the right keyword direction because, in most databases, the keywords under which a research paper is abstracted are listed with the paper.

Numerical Methods

Numerical methods used should be transparent and, where appropriate, supported by references.

Abbreviations

Authors must list all the abbreviations used in the paper at the end of the paper or in a separate table before using them.

Formulas and equations

Authors are advised to submit any mathematical equation using either MathJax, KaTeX, or LaTeX, or in a very high-quality image.

Tables, Figures, and Figure Legends

Tables: Tables should be cautiously designed, uncrowned, and include only essential data. Each must have an Arabic number, e.g., Table 4, a self-explanatory caption, and be on a separate sheet. Authors must submit tables in an editable format and not as images. References to these tables (if any) must be mentioned accurately.

Figures

Figures are supposed to be submitted as separate files. Always include a citation in the text for each figure using Arabic numbers, e.g., Fig. 4. Artwork must be submitted online in vector electronic form or by emailing it.

Preparation of Eletronic Figures for Publication

Although low-quality images are sufficient for review purposes, print publication requires high-quality images to prevent the final product being blurred or fuzzy. Submit (possibly by e-mail) EPS (line art) or TIFF (halftone/ photographs) files only. MS PowerPoint and Word Graphics are unsuitable for printed pictures. Avoid using pixel-oriented software. Scans (TIFF only) should have a resolution of at least 350 dpi (halftone) or 700 to 1100 dpi (line drawings). Please give the data for figures in black and white or submit a Color Work Agreement form. EPS files must be saved with fonts embedded (and with a TIFF preview, if possible).

For scanned images, the scanning resolution at final image size ought to be as follows to ensure good reproduction: line art: >650 dpi; halftones (including gel photographs): >350 dpi; figures containing both halftone and line images: >650 dpi.

Color charges: Authors are advised to pay the full cost for the reproduction of their color artwork. Hence, please note that if there is color artwork in your manuscript when it is accepted for publication, we would require you to complete and return a Color Work Agreement form before your paper can be published. Also, you can email your editor to remove the color fee after acceptance of the paper.

Tips for writing a good quality Medical Research Paper

1. Choosing the topic: In most cases, the topic is selected by the interests of the author, but it can also be suggested by the guides. You can have several topics, and then judge which you are most comfortable with. This may be done by asking several questions of yourself, like "Will I be able to carry out a search in this area? Will I find all necessary resources to accomplish the search? Will I be able to find all information in this field area?" If the answer to this type of question is "yes," then you ought to choose that topic. In most cases, you may have to conduct surveys and visit several places. Also, you might have to do a lot of work to find all the rises and falls of the various data on that subject. Sometimes, detailed information plays a vital role, instead of short information. Evaluators are human: The first thing to remember is that evaluators are also human beings. They are not only meant for rejecting a paper. They are here to evaluate your paper. So present your best aspect.

2. Think like evaluators: If you are in confusion or getting demotivated because your paper may not be accepted by the evaluators, then think, and try to evaluate your paper like an evaluator. Try to understand what an evaluator wants in your research paper, and you will automatically have your answer. Make blueprints of paper: The outline is the plan or framework that will help you to arrange your thoughts. It will make your paper logical. But remember that all points of your outline must be related to the topic you have chosen.

3. Ask your guides: If you are having any difficulty with your research, then do not hesitate to share your difficulty with your guide (if you have one). They will surely help you out and resolve your doubts. If you can't clarify what exactly you require for your work, then ask your supervisor to help you with an alternative. He or she might also provide you with a list of essential readings.

4. Use of computer is recommended: As you are doing research in the field of medical research then this point is quite obvious. Use right software: Always use good quality software packages. If you are not capable of judging good software, then you can lose the quality of your paper unknowingly. There are various programs available to help you which you can get through the internet.

5. Use the internet for help: An excellent start for your paper is using Google. It is a wondrous search engine, where you can have your doubts resolved. You may also read some answers for the frequent question of how to write your research paper or find a model research paper. You can download books from the internet. If you have all the required books, place importance on reading, selecting, and analyzing the specified information. Then sketch out your research paper. Use big pictures: You may use encyclopedias like Wikipedia to get pictures with the best resolution. At Global Journals, you should strictly follow here.



6. Bookmarks are useful: When you read any book or magazine, you generally use bookmarks, right? It is a good habit which helps to not lose your continuity. You should always use bookmarks while searching on the internet also, which will make your search easier.

7. Revise what you wrote: When you write anything, always read it, summarize it, and then finalize it.

8. Make every effort: Make every effort to mention what you are going to write in your paper. That means always have a good start. Try to mention everything in the introduction—what is the need for a particular research paper. Polish your work with good writing skills and always give an evaluator what he wants. Make backups: When you are going to do any important thing like making a research paper, you should always have backup copies of it either on your computer or on paper. This protects you from losing any portion of your important data.

9. Produce good diagrams of your own: Always try to include good charts or diagrams in your paper to improve quality. Using several unnecessary diagrams will degrade the quality of your paper by creating a hodgepodge. So always try to include diagrams which were made by you to improve the readability of your paper. Use of direct quotes: When you do research relevant to literature, history, or current affairs, then use of quotes becomes essential, but if the study is relevant to science, use of quotes is not preferable.

10. Use proper verb tense: Use proper verb tenses in your paper. Use past tense to present those events that have happened. Use present tense to indicate events that are going on. Use future tense to indicate events that will happen in the future. Use of wrong tenses will confuse the evaluator. Avoid sentences that are incomplete.

11. Pick a good study spot: Always try to pick a spot for your research which is quiet. Not every spot is good for studying.

12. Know what you know: Always try to know what you know by making objectives, otherwise you will be confused and unable to achieve your target.

13. Use good grammar: Always use good grammar and words that will have a positive impact on the evaluator; use of good vocabulary does not mean using tough words which the evaluator has to find in a dictionary. Do not fragment sentences. Eliminate one-word sentences. Do not ever use a big word when a smaller one would suffice.

Verbs have to be in agreement with their subjects. In a research paper, do not start sentences with conjunctions or finish them with prepositions. When writing formally, it is advisable to never split an infinitive because someone will (wrongly) complain. Avoid clichés like a disease. Always shun irritating alliteration. Use language which is simple and straightforward. Put together a neat summary.

14. Arrangement of information: Each section of the main body should start with an opening sentence, and there should be a changeover at the end of the section. Give only valid and powerful arguments for your topic. You may also maintain your arguments with records.

15. Never start at the last minute: Always allow enough time for research work. Leaving everything to the last minute will degrade your paper and spoil your work.

16. Multitasking in research is not good: Doing several things at the same time is a bad habit in the case of research activity. Research is an area where everything has a particular time slot. Divide your research work into parts, and do a particular part in a particular time slot.

17. Never copy others' work: Never copy others' work and give it your name because if the evaluator has seen it anywhere, you will be in trouble. Take proper rest and food: No matter how many hours you spend on your research activity, if you are not taking care of your health, then all your efforts will have been in vain. For quality research, take proper rest and food.

18. Go to seminars: Attend seminars if the topic is relevant to your research area. Utilize all your resources.

19. Refresh your mind after intervals: Try to give your mind a rest by listening to soft music or sleeping in intervals. This will also improve your memory. Acquire colleagues: Always try to acquire colleagues. No matter how sharp you are, if you acquire colleagues, they can give you ideas which will be helpful to your research.

20. Think technically: Always think technically. If anything happens, search for its reasons, benefits, and demerits. Think and then print: When you go to print your paper, check that tables are not split, headings are not detached from their descriptions, and page sequence is maintained.

21. Adding unnecessary information: Do not add unnecessary information like "I have used MS Excel to draw graphs." Irrelevant and inappropriate material is superfluous. Foreign terminology and phrases are not apropos. One should never take a broad view. Analogy is like feathers on a snake. Use words properly, regardless of how others use them. Remove quotations. Puns are for kids, not grunt readers. Never oversimplify: When adding material to your research paper, never go for oversimplification; this will definitely irritate the evaluator. Be specific. Never use rhythmic redundancies. Contractions shouldn't be used in a research paper. Comparisons are as terrible as clichés. Give up ampersands, abbreviations, and so on. Remove commas that are not necessary. Parenthetical words should be between brackets or commas. Understatement is always the best way to put forward earth-shaking thoughts. Give a detailed literary review.

22. Report concluded results: Use concluded results. From raw data, filter the results, and then conclude your studies based on measurements and observations taken. An appropriate number of decimal places should be used. Parenthetical remarks are prohibited here. Proofread carefully at the final stage. At the end, give an outline to your arguments. Spot perspectives of further study of the subject. Justify your conclusion at the bottom sufficiently, which will probably include examples.

23. Upon conclusion: Once you have concluded your research, the next most important step is to present your findings. Presentation is extremely important as it is the definite medium though which your research is going to be in print for the rest of the crowd. Care should be taken to categorize your thoughts well and present them in a logical and neat manner. A good quality research paper format is essential because it serves to highlight your research paper and bring to light all necessary aspects of your research.

Informal Guidelines of Research Paper Writing

Key points to remember:

- Submit all work in its final form.
- Write your paper in the form which is presented in the guidelines using the template.
- Please note the criteria peer reviewers will use for grading the final paper.

Final points:

One purpose of organizing a research paper is to let people interpret your efforts selectively. The journal requires the following sections, submitted in the order listed, with each section starting on a new page:

The introduction: This will be compiled from reference matter and reflect the design processes or outline of basis that directed you to make a study. As you carry out the process of study, the method and process section will be constructed like that. The results segment will show related statistics in nearly sequential order and direct reviewers to similar intellectual paths throughout the data that you gathered to carry out your study.

The discussion section:

This will provide understanding of the data and projections as to the implications of the results. The use of good quality references throughout the paper will give the effort trustworthiness by representing an alertness to prior workings.

Writing a research paper is not an easy job, no matter how trouble-free the actual research or concept. Practice, excellent preparation, and controlled record-keeping are the only means to make straightforward progression.

General style:

Specific editorial column necessities for compliance of a manuscript will always take over from directions in these general guidelines.

To make a paper clear: Adhere to recommended page limits.



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Mistakes to avoid:

- Insertion of a title at the foot of a page with subsequent text on the next page.
- Separating a table, chart, or figure—confine each to a single page.
- Submitting a manuscript with pages out of sequence.
- In every section of your document, use standard writing style, including articles ("a" and "the").
- Keep paying attention to the topic of the paper.
- Use paragraphs to split each significant point (excluding the abstract).
- Align the primary line of each section.
- Present your points in sound order.
- Use present tense to report well-accepted matters.
- Use past tense to describe specific results.
- Do not use familiar wording; don't address the reviewer directly. Don't use slang or superlatives.
- Avoid use of extra pictures—include only those figures essential to presenting results.

Title page:

Choose a revealing title. It should be short and include the name(s) and address(es) of all authors. It should not have acronyms or abbreviations or exceed two printed lines.

Abstract: This summary should be two hundred words or less. It should clearly and briefly explain the key findings reported in the manuscript and must have precise statistics. It should not have acronyms or abbreviations. It should be logical in itself. Do not cite references at this point.

An abstract is a brief, distinct paragraph summary of finished work or work in development. In a minute or less, a reviewer can be taught the foundation behind the study, common approaches to the problem, relevant results, and significant conclusions or new questions.

Write your summary when your paper is completed because how can you write the summary of anything which is not yet written? Wealth of terminology is very essential in abstract. Use comprehensive sentences, and do not sacrifice readability for brevity; you can maintain it succinctly by phrasing sentences so that they provide more than a lone rationale. The author can at this moment go straight to shortening the outcome. Sum up the study with the subsequent elements in any summary. Try to limit the initial two items to no more than one line each.

Reason for writing the article—theory, overall issue, purpose.

- Fundamental goal.
- To-the-point depiction of the research.
- Consequences, including definite statistics—if the consequences are quantitative in nature, account for this; results of any numerical analysis should be reported. Significant conclusions or questions that emerge from the research.

Approach:

- Single section and succinct.
- An outline of the job done is always written in past tense.
- Concentrate on shortening results—limit background information to a verdict or two.
- Exact spelling, clarity of sentences and phrases, and appropriate reporting of quantities (proper units, important statistics) are just as significant in an abstract as they are anywhere else.

Introduction:

The introduction should "introduce" the manuscript. The reviewer should be presented with sufficient background information to be capable of comprehending and calculating the purpose of your study without having to refer to other works. The basis for the study should be offered. Give the most important references, but avoid making a comprehensive appraisal of the topic. Describe the problem visibly. If the problem is not acknowledged in a logical, reasonable way, the reviewer will give no attention to your results. Speak in common terms about techniques used to explain the problem, if needed, but do not present any particulars about the protocols here.

The following approach can create a valuable beginning:

- Explain the value (significance) of the study.
- Defend the model—why did you employ this particular system or method? What is its compensation? Remark upon its appropriateness from an abstract point of view as well as pointing out sensible reasons for using it.
- Present a justification. State your particular theory(-ies) or aim(s), and describe the logic that led you to choose them.
- Briefly explain the study's tentative purpose and how it meets the declared objectives.

Approach:

Use past tense except for when referring to recognized facts. After all, the manuscript will be submitted after the entire job is done. Sort out your thoughts; manufacture one key point for every section. If you make the four points listed above, you will need at least four paragraphs. Present surrounding information only when it is necessary to support a situation. The reviewer does not desire to read everything you know about a topic. Shape the theory specifically—do not take a broad view.

As always, give awareness to spelling, simplicity, and correctness of sentences and phrases.

Procedures (methods and materials):

This part is supposed to be the easiest to carve if you have good skills. A soundly written procedures segment allows a capable scientist to replicate your results. Present precise information about your supplies. The suppliers and clarity of reagents can be helpful bits of information. Present methods in sequential order, but linked methodologies can be grouped as a segment. Be concise when relating the protocols. Attempt to give the least amount of information that would permit another capable scientist to replicate your outcome, but be cautious that vital information is integrated. The use of subheadings is suggested and ought to be synchronized with the results section.

When a technique is used that has been well-described in another section, mention the specific item describing the way, but draw the basic principle while stating the situation. The purpose is to show all particular resources and broad procedures so that another person may use some or all of the methods in one more study or referee the scientific value of your work. It is not to be a step-by-step report of the whole thing you did, nor is a methods section a set of orders.

Materials:

Materials may be reported in part of a section or else they may be recognized along with your measures.

Methods:

- Report the method and not the particulars of each process that engaged the same methodology.
- Describe the method entirely.
- To be succinct, present methods under headings dedicated to specific dealings or groups of measures.
- Simplify—detail how procedures were completed, not how they were performed on a particular day.
- If well-known procedures were used, account for the procedure by name, possibly with a reference, and that's all.

Approach:

It is embarrassing to use vigorous voice when documenting methods without using first person, which would focus the reviewer's interest on the researcher rather than the job. As a result, when writing up the methods, most authors use third person passive voice.

Use standard style in this and every other part of the paper—avoid familiar lists, and use full sentences.

What to keep away from:

- Resources and methods are not a set of information.
- Skip all descriptive information and surroundings—save it for the argument.
- Leave out information that is immaterial to a third party.



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Results:

The principle of a results segment is to present and demonstrate your conclusion. Create this part as entirely objective details of the outcome, and save all understanding for the discussion.

The page length of this segment is set by the sum and types of data to be reported. Use statistics and tables, if suitable, to present consequences most efficiently.

You must clearly differentiate material which would usually be incorporated in a study editorial from any unprocessed data or additional appendix matter that would not be available. In fact, such matters should not be submitted at all except if requested by the instructor.

Content:

- Sum up your conclusions in text and demonstrate them, if suitable, with figures and tables.
- In the manuscript, explain each of your consequences, and point the reader to remarks that are most appropriate.
- Present a background, such as by describing the question that was addressed by creation of an exacting study.
- Explain results of control experiments and give remarks that are not accessible in a prescribed figure or table, if appropriate.
- Examine your data, then prepare the analyzed (transformed) data in the form of a figure (graph), table, or manuscript.

What to stay away from:

- Do not discuss or infer your outcome, report surrounding information, or try to explain anything.
- Do not include raw data or intermediate calculations in a research manuscript.
- Do not present similar data more than once.
- A manuscript should complement any figures or tables, not duplicate information.
- Never confuse figures with tables—there is a difference.

Approach:

As always, use past tense when you submit your results, and put the whole thing in a reasonable order.

Put figures and tables, appropriately numbered, in order at the end of the report.

If you desire, you may place your figures and tables properly within the text of your results section.

Figures and tables:

If you put figures and tables at the end of some details, make certain that they are visibly distinguished from any attached appendix materials, such as raw facts. Whatever the position, each table must be titled, numbered one after the other, and include a heading. All figures and tables must be divided from the text.

Discussion:

The discussion is expected to be the trickiest segment to write. A lot of papers submitted to the journal are discarded based on problems with the discussion. There is no rule for how long an argument should be.

Position your understanding of the outcome visibly to lead the reviewer through your conclusions, and then finish the paper with a summing up of the implications of the study. The purpose here is to offer an understanding of your results and support all of your conclusions, using facts from your research and generally accepted information, if suitable. The implication of results should be fully described.

Infer your data in the conversation in suitable depth. This means that when you clarify an observable fact, you must explain mechanisms that may account for the observation. If your results vary from your prospect, make clear why that may have happened. If your results agree, then explain the theory that the proof supported. It is never suitable to just state that the data approved the prospect, and let it drop at that. Make a decision as to whether each premise is supported or discarded or if you cannot make a conclusion with assurance. Do not just dismiss a study or part of a study as "uncertain."

Research papers are not acknowledged if the work is imperfect. Draw what conclusions you can based upon the results that you have, and take care of the study as a finished work.

- You may propose future guidelines, such as how an experiment might be personalized to accomplish a new idea.
- Give details of all of your remarks as much as possible, focusing on mechanisms.
- Make a decision as to whether the tentative design sufficiently addressed the theory and whether or not it was correctly restricted. Try to present substitute explanations if they are sensible alternatives.
- One piece of research will not counter an overall question, so maintain the large picture in mind. Where do you go next? The best studies unlock new avenues of study. What questions remain?
- Recommendations for detailed papers will offer supplementary suggestions.

Approach:

When you refer to information, differentiate data generated by your own studies from other available information. Present work done by specific persons (including you) in past tense.

Describe generally acknowledged facts and main beliefs in present tense.

The Administration Rules

Administration Rules to Be Strictly Followed before Submitting Your Research Paper to Global Journals Inc.

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Written material: You may discuss this with your guides and key sources. Do not copy anyone else's paper, even if this is only imitation, otherwise it will be rejected on the grounds of plagiarism, which is illegal. Various methods to avoid plagiarism are strictly applied by us to every paper, and, if found guilty, you may be blacklisted, which could affect your career adversely. To guard yourself and others from possible illegal use, please do not permit anyone to use or even read your paper and file.

Criterion for Grading a Research Paper (Compilation) by Global Journals

Please note that following table is only a Grading of "Paper Compilation" and not on "Performed/Stated Research" whose grading solely depends on Individual Assigned Peer Reviewer and Editorial Board Member. These can be available only on request and after decision of Paper. This report will be the property of Global Journals.

Topics	Grades		
	A-B	**C-D**	**E-F**
Abstract	Clear and concise with appropriate content, Correct format. 200 words or below	Unclear summary and no specific data, Incorrect form Above 200 words	No specific data with ambiguous information Above 250 words
Introduction	Containing all background details with clear goal and appropriate details, flow specification, no grammar and spelling mistake, well organized sentence and paragraph, reference cited	Unclear and confusing data, appropriate format, grammar and spelling errors with unorganized matter	Out of place depth and content, hazy format
Methods and Procedures	Clear and to the point with well arranged paragraph, precision and accuracy of facts and figures, well organized subheads	Difficult to comprehend with embarrassed text, too much explanation but completed	Incorrect and unorganized structure with hazy meaning
Result	Well organized, Clear and specific, Correct units with precision, correct data, well structuring of paragraph, no grammar and spelling mistake	Complete and embarrassed text, difficult to comprehend	Irregular format with wrong facts and figures
Discussion	Well organized, meaningful specification, sound conclusion, logical and concise explanation, highly structured paragraph reference cited	Wordy, unclear conclusion, spurious	Conclusion is not cited, unorganized, difficult to comprehend
References	Complete and correct format, well organized	Beside the point, Incomplete	Wrong format and structuring

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