

HAND WASHING PRACTICES AND INCIDENCE OF DISEASE SYMPTOMS AMONG COLLEGE STUDENTS: A CASE STUDY OF OSUN STATE COLLEGE OF TECHNOLOGY, ESA-OKE.

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ABSTRACT

This study examined hand washing practices and incidence of disease symptoms among college students. This was done with the aim of evaluating the awareness of students on the importance of hand washing as barrier to infection and demographic influences on hand hygiene practices. A structured questionnaire was distributed amongst 330 college students. Confidence interval was set at 95% and all tests were two-tailed. Statistical significance was considered at a p - value of less than 0.05. The most occurring (53 %) age group was 26-30 years. More males (64 %) than females (36 %) participated in the study. Respondents that were aware that hand washing helps to prevent infection were 81 %. Most respondents (44 %) washed their hands 1-3 times daily. Sixty-one per cent respondents reported they always washed their hands before eating. After urinating, 58 % respondents sometimes washed their hands, 27 % always did and 12 % frequently did. After defecating, 49 % sometimes washed their hands, 35 % always did and 13 % frequently did. Most respondents (62 %) washed their hands with soap and water after toilet use. There was significant association between age, level of study and intensity of after-toilet hand wash ($P < 0.05$). Fever was the most reported (104) symptom of infection. The highest frequency of symptom recorded in the last 6 months was 1-3 times (227). This study concluded that hand washing knowledge and practice of the population examined was above average. Age and educational level were shown as important influences on hand washing practices.

Keywords: hand hygiene, infectious diseases, anti-bacterial, college students, Nigeria

INTRODUCTION

College students have been a prime population for the spread of infectious diseases. Half of about 20 million new cases of sexually transmitted diseases (STDs) diagnosed annually are found among the college-aged subpopulation (CDC, 2015). College students, especially those in dormitories of residential institutions stand higher risks of contracting meningococcal diseases, upper respiratory tract infections and a host of other communicable ailments (Shetty *et al.*, 2009; Rogers and Crimmins, 2011; Long *et al.*, 2012). Inasmuch as communicable diseases could spread by various routes, the importance of hand washing as infection control has long been underscored (Rhinehart and Friedman, 1999; Khan, 2004; Rhinehart and Friedman, 2005; Kaplow and Hardin, 2007; Minnaar, 2008). Diseases such as gastroenteritis easily passed on by hand shake (Howard, 1994) can be effectively controlled

by good hand hygiene. Hand washing provides a simple, low cost infection preventive measure (Mathur, 2011). A review of studies on hand washing and infection control concluded that the emphasis laid on hand hygiene as primary infection control measure was not misplaced (Larson, 1988). Substantial bacterial colony counts had been recorded in female bathroom sink faucet and toilet seat hence emphasising the need for high hand washing compliance in such environments (Drankiewicz and Dundes, 2003). Hand washing with antimicrobial agent reduced the rate of nosocomial infection significantly more than using alcohol and soap (Doebbeling *et al.*, 1992). In a study of 430 students recruited from university dormitories, it was shown that hand hygiene practices improved with increased awareness campaigns on its importance. The study also showed that increased hand washing amongst the students resulted in reduced symptoms of upper respiratory tract infection, general lower illness rates and lower absenteeism (White *et al.*, 2003). Hand hygiene practices have been reported better observed in academic buildings than in recreational centre of a college milieu (Anderson *et al.*, 2008). Students have also been observed to not make optimal use of hand sanitizers even when readily available for use (Anderson *et al.*, 2008). Thumma *et al.* (2009) reported there was no significant differences ($P = .40$) by gender in hand washing before eating amongst college students. Hand washing compliance was found uninfluenced by gender amongst medical students (Kadi and Salati, 2012). However, females (69 %) were found more likely than males (43 %) to always wash their hands after urinating ($P < 0.001$) and after a bowel movement ($P = .14$) (Thumma *et al.*, 2009). A study conducted in a college town environment showed gender difference in hand washing habits with women (77.9 %) using soap and engaging in proper hand washing behaviour significantly more than men (50.3 %) (Borchgrevink *et al.*, 2013). This was also the result of Taylor *et al.* (2010) study where females had a tendency to wash their hands more often than males while visiting the bathroom ($P = 0.02$). Women (87.1%) were reported to always wash their hands after using the toilet more than men (65.3 %) ($P = 0.001$) (Miko *et al.*, 2012). Other factors besides gender found to influence hand washing behaviour were presence of hand washing signs and sink cleanliness (Borchgrevink *et al.*, 2013). The study of Thumma *et al.* (2009) found no significant associations between hand washing frequency and gastrointestinal, upper respiratory, urinary or vaginal symptoms. Bliss *et al.* (2002) however found infrequent hand washing associated with group B Streptococcus colonization. Self-reported illness rates in the study of Taylor *et al.* (2010) showed that non-hand washers were more likely to become ill than hand washers ($P < 0.001$). Hand washing may also play a vital role in reducing incidence of pneumonia (Pommerville, 2010). Ninety seven per cent of some study participants believed hand washing was either very important or somewhat important for preventing disease (Miko *et al.*, 2012). Compliance with hand hygiene practices may be influenced by students' college majors. Science majors were more likely to wash their hands than non-science majors (Taylor *et al.*, 2010). Medical students were shown to have positive indications of hand hygiene awareness but low compliance (Kadi and Salati, 2012). This study set out to identify the hand wash patterns of college students in Osun State College of Technology Esa-Oke, with a view to establishing associations with incidence of infectious disease symptoms within the same population.

METHOD

Study Location and Population

The study was carried out in the Osun State College of Technology, Esa-Oke, Nigeria. The study was conducted among students of this tertiary institution.

Study Design

A cross-sectional design was employed in this study. A cross-sectional study is that in which data collection is done at only a period in time (Parasuraman *et al.*, 2006) as opposed to a longitudinal study conducted on same subjects over time. This type of study design was chosen for its obvious advantage of short duration, less expense and ability to determine associations between variables of interests (Page *et al.*, 1995).

Sample Size Determination:

The sample size for the study group was calculated using the formula according to Kish (Kish, 1995):

$$N = z^2 p (1 - p) \div d^2 \quad (1)$$

Description:

n	=	required sample size.
z	=	z score of confidence level (1.96)
p	=	standard deviation / variance expected (0.5)
d	=	confidence interval (0.0566)

By equation (1), N was estimated to be 300 respondents.

An attrition rate of 10 % (30) was calculated and added to the calculated sample size to take care of incomplete responses or improperly completed questionnaires.

Sampling Technique

Convenience sampling was employed in selecting participants from the sample population. Willing students were given copies of the structured questionnaire to complete.

Study Instrument

Structured socio-demographic questionnaire:

A structured socio-demographic questionnaire (Appendix I) was completed by the respondents. This questionnaire contained three sections A, B and C. Section A collected demographic information of respondents, section B collected information on hand washing practices of respondents and section C collated information on incidence of infectious diseases.

Ethical Consideration

Participation in the study was out of respondent volition. Findings from the study were used for academic purposes only. Private information of human subjects were not collated nor divulged during the course of the study.

Data Analysis

Data analysis was done using Statistical Package for Social Sciences (SPSS version 21). The socio-demographic details of respondents were reported using descriptive statistics such as

frequency, means, and standard deviation (SD). Inferential statistic was used appropriately. Confidence interval was set at 95% and all tests were two-tailed. Statistical significance was considered at a p-value of less than 0.05. Results are presented in prose with tables and figures (bar and pie chart) for illustrations.

RESULTS

Demographic information

Figure 4.1 presented the age frequencies of respondents. The most occurring (53 %) age group was 26-30 yr, followed by respondents in the age bracket 21-25 yr (25 %), and those aged 15-20 yr (13%). More males (64 %) than females (36 %) participated in the study (Fig. 4.2). Respondents in HND 2 made up 47 % of the sample size. Those in HND 1, ND 2 and ND 1 were 20 %, 21 % and 11 % respectively (Fig. 4.3).

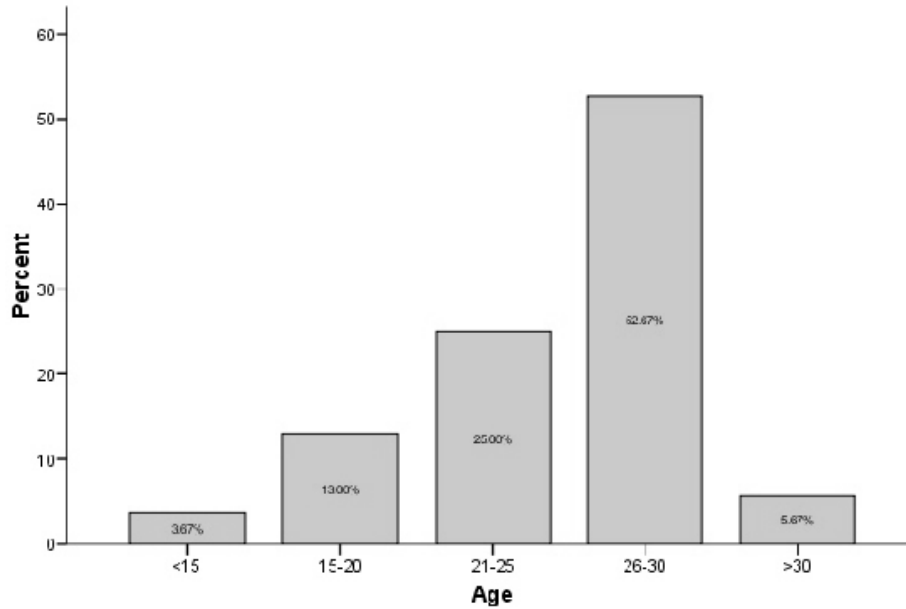


Fig. 4.1: Age of Respondents
Source: Field Data

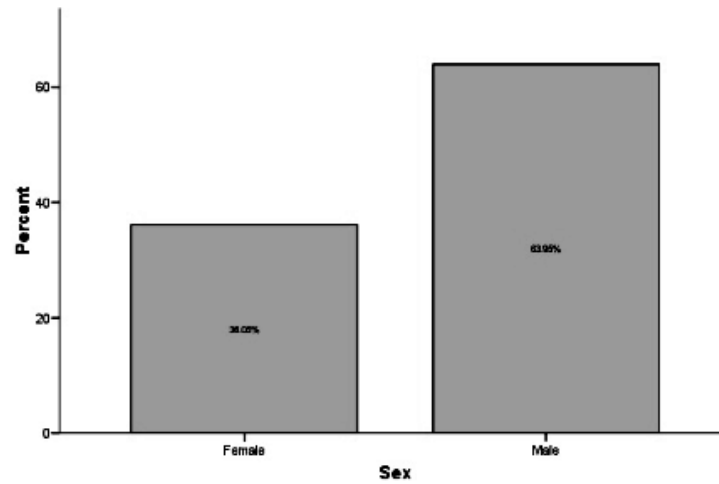


Fig. 4.2: Sex of Respondents
Source: Field Data

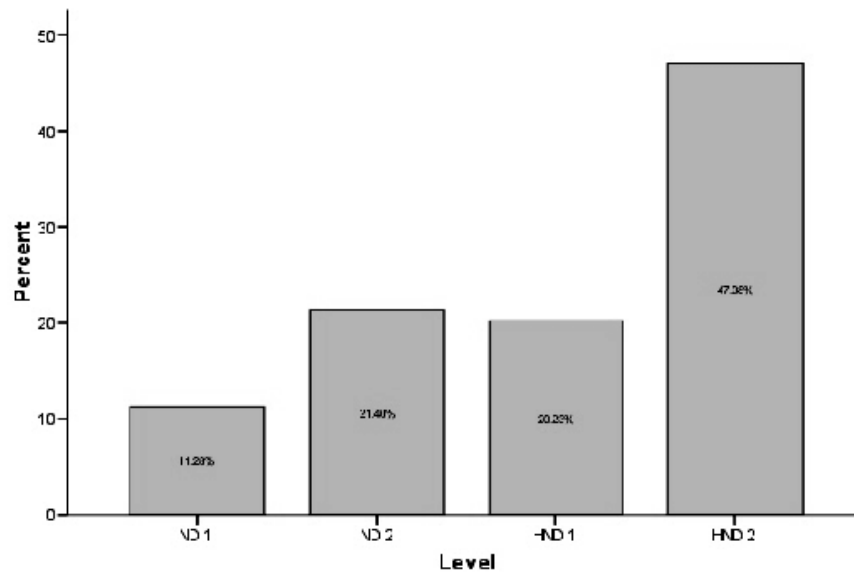


Fig. 4.3: Level of Respondents
Source: Field Data

Hand washing Practices

Table 4.1 showed the hand washing practices of respondents. Respondents that were aware hand washing helps prevent infection were 81 % while 18 % were not. Most respondents (44 %) washed their hands 1-3 times daily, followed by 4-6 times daily by 36 % of respondents. Sixty-one per cent respondents reported they always washed their hands before eating, 24 % said they sometimes did. After urinating, 58 % respondents sometimes washed their hands, 27 % always did and 12 % frequently did. After defecating, 49 % sometimes washed their hands, 35 % always did and 13 % frequently did. The highest numbers (44 %) of people respondents shared toilets with were 1-3, followed by 4-6 (22 %), and 0 (17 %). Most respondents (62 %) washed their hands with soap and water, 17 % washed with water only while only 12 % washed their hands with antibacterial soap and water after using the toilet.

Associations between Demographic Variables and After-toilet Handwash

Tables 4.2-4 depicted the associations between demographic variables and propensity of respondents to wash their hands after using the toilet. All associations were significant ($P < 0.05$) except for that between sex and intensity of after-toilet hand wash ($P = 0.20$). The age group most likely to wash their hands with antibacterial soap and water were 21-25 yr (25%). Eighty percent of respondents between the ages of 26-30 yr were most likely to wash their hands with soap and water while 32 % of the 15-20 yr age group were most likely to wash their hands with only. (Table 4.2). More females (20 %) than males (11%) were likely to wash their hands with antibacterial soap and water. More males (70%) than females (50%) were likely to wash their hands with soap and water and also more females (23%) than males (16%) were likely to wash their hands with water alone after using the toilet (Table 4.3). Twenty nine percent of ND 1 students were most likely to wash their hands with antibacterial soap and water, while 78 % of HND 2 students were most likely to use soap and water in cleansing their hands after a visit to the toilet (Table 4.4).

Incidence of Infectious Diseases Symptoms

Fever was the most reported (104) symptoms of infection, followed by eye discharge (46), itchy eye (22), cough (21) and red eye (20) (Fig. 4.4). The frequency of these symptoms recorded in the last 6 months were mostly 1-3 times (227), and 4-6 times (23).

Table 4.1: Hand Washing Practices of Respondents

<i>Aware handwashing helps prevents infection?</i>	<i>Response</i>	<i>Freq</i>	<i>%</i>
	No	54	18
	Yes	242	80.7
	Total	296	98.7
	No response	4	1.33
	Grand Total	300	100

Daily handwash frequency	Response	Freq	%
	1-3	132	44
	4-6	108	36
	7-9	35	11.7
	>9	24	8
	Total	299	99.7
	No response	1	0.33
	Grand Total	300	100
Handwashing done before eating?	Response	Freq	%
	Never	7	2.33
	Sometimes	71	23.7
	Frequently	39	13
	Always	183	61
	Total	300	100
Handwashing done after urinating?	Response	Freq	%
	Never	10	3.33
	Sometimes	174	58
	Frequently	36	12
	Always	80	26.7
	Total	300	100
Handwashing done after defecating?	Response	Freq	%
	Never	4	1.33
	Sometimes	148	49.3
	Frequently	39	13
	Always	106	35.3
	Total	297	99
	No response	3	1
	Grand Total	300	100
Number of people sharing toilet	Response	Freq	%
	0	52	17.3
	1-3	131	43.7
	4-6	67	22.3
	7-9	28	9.33
	>9	14	4.67

Source: Field Data

Table 4.2: Association between age and intensity of after-toilet hand wash

		Intensity of after-toilet handwash				Total	DF	X ²	P Value
		Do not wash hand after using toilet	Wash hands with water only	Wash hands with soap and water	Wash hands with antibacterial soap and water				
Age	<15	18.2%	27.3%	36.4%	18.2%	100.0%	12	46.664	0.000
	15-20	8.1%	32.4%	51.4%	8.1%	100.0%			
	21-25	4.2%	25.4%	45.1%	25.4%	100.0%			
	26-30	2.6%	9.9%	80.1%	7.3%	100.0%			
	>30	6.3%	12.5%	56.3%	25.0%	100.0%			
Total		4.5%	17.5%	64.7%	13.3%	100.0%			

Source: Authors

Table 4.3: Association between sex and intensity of after-toilet hand wash

		Intensity of after-toilet handwash				Total	DF	X ²	P Value
		Do not wash hand after using toilet	Wash hands with water only	Wash hands with soap and water	Wash hands with antibacterial soap and water				
Sex	Female	6.5%	22.8%	50.0%	20.7%	100.0%	3	9.844	0.20
	Male	3.9%	15.5%	69.7%	11.0%	100.0%			
Total		4.9%	18.2%	62.3%	14.6%	100.0%			

Source: Authors

Table 4.4: Association between level and intensity of after-toilet hand wash

		Intensity of after-toilet handwash				Total	DF	X ²	P Value
		Do not wash hand after using toilet	Wash hands with water only	Wash hands with soap and water	Wash hands with antibacterial soap and water				
Level	ND 1	7.1%	32.1%	32.1%	28.6%	100.0%	9	33.979	0.000
	ND 2	3.8%	28.3%	45.3%	22.6%	100.0%			
	HND 1	8.3%	25.0%	52.1%	14.6%	100.0%			
	HND 2	4.4%	10.5%	78.1%	7.0%	100.0%			
Total		5.3%	19.8%	60.5%	14.4%	100.0%			

Source: Authors

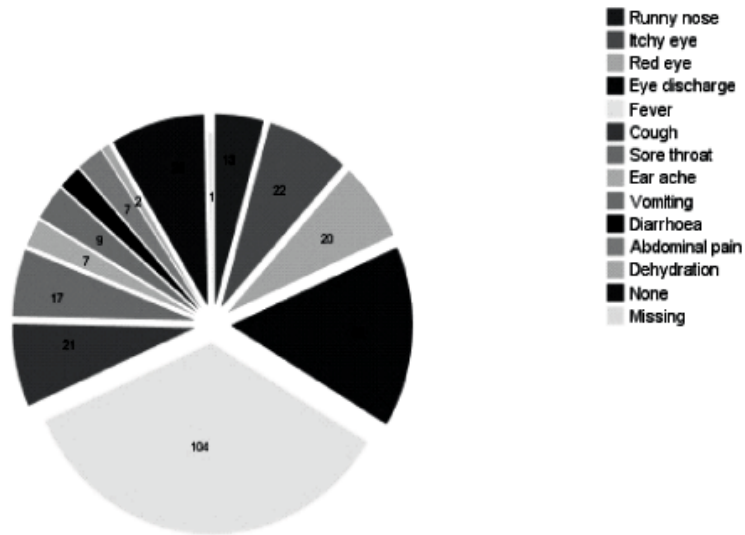


Fig. 4.4: Infectious Disease Symptom Experienced in Past Six Months

Source: Field Data

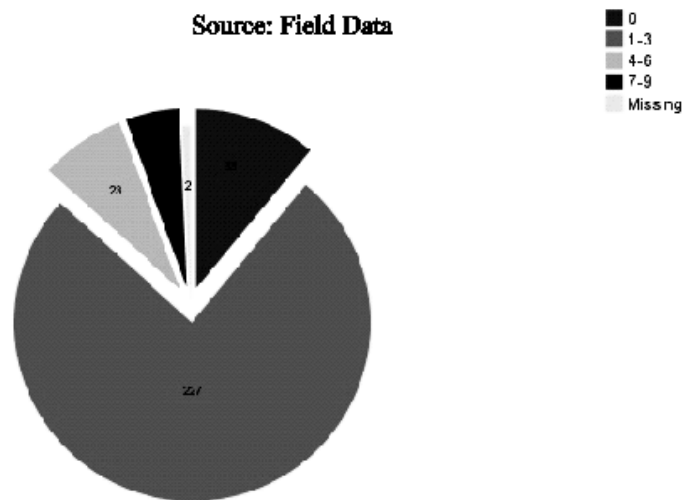


Fig. 4.5: Frequency of Infectious Disease Symptom Experienced in Past Six Months

Source: Field Data

DISCUSSION

In the present study, most respondents were aware that hand washing helps prevent infection (Table 4.1). This is in line with reports from literature reviewed (White *et al.*, 2003; Kadi and Salati, 2012; Miko *et al.*, 2012). The most prevalent frequencies of daily hand washing were 1-3 and 4-6 times daily. These frequencies of hand washing are fair and if done properly could provide significant barrier to spread infection among college students given to habits like shaking hands. The fact that most respondents reported they always washed their hands before eating (Table 4.1) also attested to the above-average level of awareness of hand washing importance amongst respondents in present study. There were relatively low percentages of respondents who washed their hands always after urinating or defecating; hence, the need for consistence in awareness campaigns especially amongst students with high propensity to share toilets and thus spread infectious diseases thereafter. More than half of respondents also washed their hands with water and soap. This also suggested average awareness as to the importance of keeping clean hands amongst respondents. Demographic variables were found to play significant roles in hand washing practices of college students in reviewed literature (Thumma *et al.*, 2009; Taylor *et al.*, 2010; Kadi and Salati, 2012; Miko *et al.*, 2012; Borchgrevink *et al.*, 2013) and in this study Tables 4.2-4 must be taken into consideration whilst tailoring awareness campaigns. Older respondents were found to be more likely to use soap with water while washing their hands. This is logical as older respondents are more likely to better appreciate the importance of soap in cleansing. Wahrman (2016) had reviewed several studies on gender influence on handwashing and found females consistently performed better in employing antibacterial soap and water when cleansing their hands after toilet use. This was also established as true in this study. Also, higher educational levels meant access to knowledge about wider range of discourse (Curaj *et al.*, 2012) including cleanliness and its association with good health. It is therefore in line that more HND students than ND student were likely to employ the use of soap alongside water in ensuring their hands were clean after using the toilet.

CONCLUSION

Studied population were largely aware of hand hygiene as barrier to spread of infectious diseases and practised it around important functions such as food consumption and toilet visits. We also found significant influence exerted on hand washing practices by demographic attributes particularly age and educational level.

RECOMMENDATION

Given the influence of age on hand washing practice, catch-them-young awareness campaigns should be carried out by stake holders to further increase the numbers of students, especially freshmen that understand the importance of hand washing to their health. Medicated soaps may be provided to students to encourage the use of soaps with water in hand washing especially after toilet use. Students sharing toilet facilities especially should be targeted in spreading information and provision of amenities to increase the habit of hand washing with soap after toilet use.

REFERENCES

- Akenroye & Opawale (2012) A Survey Of Physicochemical and Bacteriological Quality of Pipe Borne Water Used For Drinking In Rufus Giwa Polytechnic, Owo Ondo State, Nigeria. *Greener Journal of Science Engineering And Technology Research Issn*; 2276 –7835.
- Divya, Sunil & Latha (2011) Physicochemical Analysis of Well Water At Eloor Industrial Area Seasonal Study, Kerala (India). *Current World Environment Vol. 6(2)*, 259
- Wikipedia (2016) Drinking Water Quality Standards.. https://en.wikipedia.org/w/index.php?title=Drinking_water_quality_standards&oldid=733205923. Retrieved on 08/03/2016.
- Emmanuel & Ayeni (2012) Physicochemical Analysis of Ground Water Samples Of Bichi Local Government Area of Kano State of Nigeria. *ARPJ Journal of Science And Technology* Vol 2, pp. 325 -332.
- Ezeribe, Oshieke & Jauro (2012) Physicochemical Properties of Well Water Samples From Some Villages In Nigeria With Cases of Stained And Mottle Teeth Science. *World Journal* Vol 7 No 1.
- Fawole M O, and Osho B.A(2002). Laboratory Manual of Microbiology. *Spectrum Books LMD; 2002. Pp. ... Clinical and Laboratory Standards Institute.*
- Kadave, Bhor, Bhor & Bhosale (2012) Physicochemical Analysis of Open Well Water Samples Near Industrial Area Of Niphad, Nashik Didtrict, (Maharashtra), India. *Iqrs Journal of Environmental Science, Toxicology And Food Technology*, Vol. 1 Pp. 07 – 011
- Mahananda, Mohanty & Behera (2010) Physicochemical Analysis of Surface And Groundwater Of Bargarh District, Orissa, India. *Ijrras* 2(3).
- Mustafa, Allamin, Ismail & Shettima (2013) Physicochemical And Bacteriological Analysis of Drinking water From wash Boreholes In Maiduguri Metropolis, Borno State, Nigeria *Journal Of Food Science* Vol. 7 (1) Pp. 9 -13.
- Reddy & Reddy (2011) Physicochemical Analysis of Surface And Ground Water of Selective Areas Of Ucil Thummalapalli Project, Ysr (Kaolapa), Ap, India. *African Journal Of Scientific Research* Vol. 3, No. 1.
- Sharma, Dubey & Chartterjee (2014) Pre- Monsoon Physicochemical Analysis of Surface And Ground Water of Abhanpur Block In District. *India Recent Research In Science And Technology* Vol 6(1):157– 161.
- Shy Amala, Shanthi & Lalitha (2008) Physicochemical Analysis of Borewell Water Samples of Telungupalayam Area In Coimbatore District, Tamilnadu, India. *E-Journal of Chemistry* Vol. 5, No. 4, Pp. 924 – 929.
- Shittu, Olaitan, & Amusa, (2008) Physicochemical And Bacteriological Analysis of Water Used For Drinking And Swimming Purposes in Abeokuta, Nigeria. *African Journal of Biomedical Research*, Vol. 11 Pp. 285 – 290
- WHO. 2011. "Guidelines for Drinking-Water Quality, Fourth Edition - 9789241548151_eng.pdf." Accessed, March/26
...http://apps.who.int/iris/bitstream/10665/44584/1/9789241548151_eng.pdf.