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By Femi J. Ayoola & Oshodi, O.C.

University of Ibadan, Nigeria

Abstract- Condom use during sexual intercourse has been ascertained to be a good contraceptive method that reduces the spread of HIV/STDs. Youths which constitute a high proportion of Nigerians will be at risk of HIV/STDs if they miss the mark to use condom and more research should focus on how to encourage sexually active youth in protected sexually activities. This study utilized NARHS 2007 survey dataset. It focused on sample of males and females age 15-24 years living in regular households in rural and urban area in Nigeria.

The dependent variables were lifetimes and current use of condom. Data was analysed using Chi-square and logistic regression (α=5.0%). Mean age of the respondent was 19.6±2.8, 25.1% are lifetime use of condom and current use of condom among those who had use condom in their lifetime was 72.2%.Youth's lifetime use of condom is statistically associated with all the background characteristics except marital status while current use of condom was found to be averse few of the selected variables such as Sex, Marital status, Number of sexual partners and alcohol intake.

Keywords: condom, sex, HIV/AIDS, chi-square, logistic regression.

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ONTHECOMPARATIVEANALYSISOFDETERMINANTFACTORSONTHEUSEOFCONDOMAMONGNIGERIANYOUTHS

Strictly as per the compliance and regulations of:

On the Comparative Analysis of Determinant Factors on the use o f Condom among Nigerian Youths

Femi J. Ayoola [α] & Oshodi, O.C. [σ]

Abstract- Condom use during sexual intercourse has been ascertained to be a good contraceptive method that reduces the spread of HIV/STDs. Youths which constitute a high proportion of Nigerians will be at risk of HIV/STDs if they miss the mark to use condom and more research should focus on how to encourage sexually active youth in protected sexually activities. This study utilized NARHS 2007 survey dataset. It focused on sample of males and females age 15-24 years living in regular households in rural and urban area in Nigeria.

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The odds of lifetime condom use were higher among older youths aged 20 – 24 years. Across the six geo-political zones; southern youth are more likely to use condom (OR = 7.2, CI = 4.5 – 11.6). Female are less likely to used condom. Condom use was found to increase as youth's education increases. Christians and multiple sexual partners are more likely. The youth with low perceived risk of HIV/AIDS are significantly more likely to use condom.

Youth that takes Alcohol and drugs are more likely to use condom. In addition, the odds of females that are currently using condom decreases by 40% and the singles are 3times more likely for current use while youths with multiple sexual partners and those that also take alcohol are significantly more likely 3times more using condom.

Keywords: condom, sex, HIV/AIDS, chi-square, logistic regression.

I. Introduction

The epidemic could increase at an exponential rate in Nigeria unless adequate national and regional responses are mounted to stem the spread of HIV/AIDS.

According to Kaiser Family Foundation 2005, teens and young adults are in the centre of the epidemic because young people ages 15-24 account for approximately half of new adult HIV/AIDS infections that is the majority of those infected with HIV/AIDS has been affected with this virus before 25 years of age and 28% of the global total adults living with HIV/AIDS. Also United Nations Population Fund (2007) confirmed that young people are at the centre of the HIV/AIDS epidemic in terms of rates of infection, vulnerability and of the 1.5 billion young people worldwide, 11.8 million are estimated to be living with HIV. It is also reported that every day, between 5,000-6,000 young people (ages 15-24) contract HIV and that many of them still lack comprehensive and correct knowledge about to prevent the infection.

It is generally known that youths sometimes adopted the use of condom during sexual intercourse and the factors that necessitate condom usage among the youths during sexual activities serve as the determinants of condom usage. The determinants of condom use among youths on compulsory paramilitary national service in Nigeria were documented to include influence of sexual partner, availability of condom, and self-efficacy of condom. (Sunmola A.M, Olley B.O, et al. 2007).Also, the major mode of HIV/AIDS transmission is through heterosexual intercourse in most part of the globe, including Nigeria. The estimated number of unwanted pregnancies and unsafe abortions in the country presents state can be outlining. The projection of unwanted pregnancies and unsafe abortion to maternal morbidity and mortality in the country is very high (WHO, 2005).

Globally, around half the people who acquire HIV become infected before they turn 25 years and they die before their 35th birthday (Worldwide HIV and AIDS Statistics Commentary, 2006). Thus, many people are sexually active and without adequate information to protect themselves. Therefore, this study will help to investigate the basic characteristics that influence the use of condom among Nigeria youths (15 to 24 years old). That is, to determine the prevalence of youths who had ever used condom, to determine the background characteristics that is likely to enhance the use of condom by the youths and to examine the sexual risk factors that may influence condom use among the youths.

II. Methods and Measurement

The study employed a secondary data used for National HIV/AIDS and Reproductive Health Survey

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(NARHS), 2007 with a (three level) multi-stage sampling targeted at selecting eligible persons in each sphere (states) with equal probabilities. Comprehensive report of the methodologies involved in data collection is available on the publication of the original data collector for details on the sampling procedures and validation of the study instruments.

In the original sample 11,521respondents were interviewed. Nevertheless, this study focused on youths aged 15-24 years, setting these inclusion criteria reduced the number of youth in the sample to 3,138. However, the number of youths who had ever had sexual intercourse whether vaginal, oral, anal or combination of any of them was found to be 787 and youths who currently use condom among those that were sexually active was 568.

Two dependent variables were used in this study are; ever use of condom among the total study sample and currently use of condom among sexually active which is a subset of the studied sample. The variables was recoded into two categories; Condom = 1 and Otherwise = 0. The ever use of condom shows the level of condom use at any point in time in one lifetime while Current use of condom shows the present level of preventing sexually transmitted infections and unwanted pregnancies among youths in Nigeria.

III. Data Analysis Procedures

Data were analyses using Stata software version 12.0. The analysis began with Chi-square tests to establish associations in the selected variables. Afterwards Logistic regression was used for theoutcome variables lifetime user and current user to determine the strength of significant explanatory variables the youth.

a) Chi- Square Test

The chi-square test is used to determine whether there is a significant difference between the expected frequencies and the observed frequencies in one or more categories. Is this difference between the expected and observed due to sampling error, or is it a real difference. Chi-Square Test requirements are: quantitative data, one or more categories, independent observations, adequate sample size (at least 10), Simple random sample, data in frequency form and all observations must be used.

The chi-Square formula: $\quad 2 = \frac{\Sigma_i^n (o-e)^2}{e}$ $\qquad$ (1)

Where o = Observed Frequency in each category

e = Expected Frequency in the corresponding category

df=degree of freedom (n-1)

$\chi2$=is Chi Square

b) Logistic Regression

In the family of generalized linear models which contained models for categorical responses as well as standard models for continuous responses, the most important case is logistic regression, which is a linear model for the log it transformation of a binomial parameter. Binary logistic regression is a form of regression which is used when the dependent variable is dichotomy and the independent variables are of any type (i.e qualitative or quantitative) while Multinomial logistic regression is design to handle the case of more than two categories of dependent variable. When ranking of multiple classes of the dependent variable is put in place, then ordinal logistic regression is preferred to multinomial logistic regression. It should be noted that continuous variables cannot be used as dependents in logistic regression. So also there can be only one dependent variable in logit regression. Its predict a dependent variable on the basis of continuous and/or categorical independent variables and to determine the percent of variance in the dependent variable explained by the independents; to rank the relative importance of independents; to assess interaction effects; and to understand the impact of covariate control variables.

Logistic regression applies maximum likelihood estimation after transforming the dependent into logit variable (the natural log of the odds of the dependent occurring or not). In which case, logistic regression estimates the probability of a certain event occurring. And it calculates changes in the log odds of the independent but not changes in the dependent itself as ordinary least square does.

Logistic regression has many similarities to ordinary least square: logit coefficients correspond to β coefficients in the logistic regression equation, the standardized logit coefficient correspond to beta weights, and a R2 statistic is available to summarize the strength of the relationship unlike ordinary least square. However, logistic regression does not assume linearity of relationship between the independent variables; the dependent does not require normally distributed variables, does not assume homoscedasticity and generally has less stringent requirement. In which case, logistic regression requires that observations are independent and that the log it of the independent variables is linearly related to dependent.

The logistic regression model is given as:

$$\log\left(\frac{\pi_i}{1 - \pi_i}\right) = \sum_{k=0}^{K} \beta_k x_{ik} \text{ or}$$

$$log\left(\frac{\pi_i}{1-\pi_i}\right) = \alpha_0 + \beta_{1i}x_{1i} + \beta_{2i}x_{21} + \beta_{3i}x_{3i} + \cdots + \beta_{ki}x_{ki} \quad (2)$$

Where π_i is the outcome variable and i=1 if π_i is the proportion of youths who had used condom in their lifetime. Also, i=2 if π_i is the proportion of youth that still currently using condom in the sample studied. β's are the regression coefficients to be estimated, x's are the determinants such as age, location, zone,

are the determinants such as age, location, zone, gender, marital status, education, religion, multiple partner, perceived risk alcohol intake and drug intake.

IV. Results

The mean age and standard deviation of the respondents is 19.6±2.8. This data shows that a quarter (25.1%) of the respondent had ever used condom in their lifetime while more than three-quarter (72.2%) of those that had ever used condom are still currently using condom. All the background characteristics were found to be significantly (P<0.05) associated with lifetime use of condom except marital status but marital status and gender was found to be significantly associated with current use of condom.

Table 1 : Association of lifetime use and current use of condom with background characteristics

Variables	Lifetime use of condom			Current Use of condom		
	Yes	χ^2value	p-value	Yes	χ^2value	p-value
Age		205.015	0.000		3.820	0.051
15-19	13.6(1506)			77.5(204)		
20-24	35.7(1632)			70.3(583)		
Location		8.894	0.003		0.276	0.600
Rural	27.8(1309)			73.1(364)		
Urban	23.1(1829)			71.4(423)		
Zone		198.249	0.000		7.468	0.188
North West	6.1(445)			55.6(27)		
North East	11.0(336)			59.5(37)		
North Central	25.9(591)			73.6(159)		
South West	32.3(679)			72.6(219)		
South East	23.1(463)			72.9(107)		
South South	38.1(624)			74.4(238)		
Sex		23.555	0.000		28.956	0.000
Male	28.3(1793)			78.5(508)		
Female	20.7(1345)			60.6(279)		
Marital Status		0.469	0.493		56.249	0.000
Single	24.8(596)			48.1(156)		
Married	26.2(2542)			78.1(631)		
Education		133.993	0.000		7.359	0.061
None	7.7(92.3)			70.0(20)		
Primary	17.3(433)			62.7(75)		
Secondary	25.6(2134)			71.6(546)		
Tertiary	46.8(312)			79.5(146)		
Religion		113.590	0.000		9.124	0.725
Islam	14.3(1160)			71.1(166)		
Christianity	31.4(1978)			72.2(621)		

Older youth aged 20-24 years (35.7%) were lifetime users of condom compared to younger youths aged 15-19 years (13.6%). Youths living in the rural location were slightly higher 27.81% than youths in the urban location (23.1%). The South South zone reported the highest lifetime use of condom (38.1%), followed by the South West (32%) while it was reported least in the North West zone of the country (6.1%). Also, males use of condom was found to higher than that of females (28.3% vs. 20.7%) while married youth used condom in lifetime than singles. Lifetime condom use by education reveals a trend; the higher the education, the more the use of condoms amongst these youth. The proportion of Christians using condom are about twice the proportion of Muslims making use of condoms (31% vs. 14.4%).

Furthermore, younger youth aged 15-19 years who are currently using condom (77.5%) is more than older youth aged 20-24 years(70.3%) who are lifetime use of condom were still currently using condom. The proportion of current use of condoms between rural and urban location were similar (73.1% vs. 71.3%). More so, current use of condom across the zone was highest in the South South region (74.3%) and least in the North West (55.6%). A higher percentage (78.5%) of the male youths was more than females (60.6%) currently uses condom while married youths (78.1%) also have a higher use compared to unmarried youths (48.1%). Similarly, higher proportion of those that use condom currently were found to be more educated.

Table 2 : Association of lifetime use and current use of condom selected behavioural characteristics

Variables	Lifetime use of condom			Current Use of condom		
	Yes	χ^2 value	p-value	Yes	χ^2 value	p-value
Multiple partner		63.612	0.000		24.125	0.000
No	44.1(1050)			71.1(463)		
Yes	69.8(314)			88.1(219)		
Perceived risk		69.166	0.000		5.510	0.064
High	36.3(91)			84.9(33)		
Low	32.5(1114)			74.9(362)		
No risk	19.5(1829)			69.2(357)		
Alcohol Intake		241.329	0.000		18.397	0.000
No	19.9(2650)			67.6(528)		
Yes	54.1(453)			82.5(245)		
Drugs Intake		17.177	0.000		1.206	0.272
Never use	24.7(3083)			71.8(760)		
Use drug	49.1(55)			81.5(27)		

In investigating the association between lifetime condom use and selected behavioural characteristics, youths with two or more partners representing 69.8% is significantly associated with lifetime use of condoms compared to youths that professed to have just one sexual partner (44.1%). Perceived risk of contracting HIV/AIDs is also associated with lifetime use of condoms among the youths while the proportion of perception is higher among the perceived high risk group. Again, both alcohol use and drug use is associated with lifetime use of condoms. The result shows that 54.1% of youths who takes alcohol and 49.1% who takes drugs were significantly higher than those who do not take any of these substances. A similar scenario is observed among youths that currently use condom but there was no significant association for perceived risk of HIV/AIDS and drugs intake. Current use of condom was higher among youths with 2 or more sexual partners (88%) than those with only one sexual partner (71%). A majority (85%) of the youths rate their chances of getting HIV/AIDs as high and there was a decreasing pattern observed in these proportions as perceived risk decreases expressed by the youths that rate their chance of contracting HIV/AIDs. Also, there was a significant association between youths that currently use condom and alcohol intake (82.5%) and a similar proportion of 82% was observe among drugs users but not statistically significant.

V. Multivariate Analysis

In Table 3, older youths aged 20 – 24 years were 4times more likely to used condom compare to younger youths. Across the six geo-political zones; youth in the South South are 7times more likely to use condom in their lifetime compare to youth in North west, follow by North west (put no of times here in bracket) and North Central youth who are six times more likely, also South East youth are about 4times more likely and lastly North East youth are 2times more likely to used condom in their lifetime. Female are less likely to used condom in their lifetime compare to male since the

questions was centred on 'Have you ever used male condom', the probability that female will use it is zero ($\beta = -0.524$ ε π0). The higher the education level, the more youths are likely to use condom that is youth tends to lifetime use of condom as they go higher in their educational attainment compare to youth who do not have any academic background. It was also observed that the odds of youth who practice Christianityis 2times more compare to Muslim youth. Youth with multiple sexual partners are more like compare to youth with single partner. The odds of youth with high risk perception of contracting HIV/AIDS decreases by 25% though it is not statistically significant and youth with low risk perception of HIV/AIDs are significantly more likely to lifetime use of condom compare to youth that reported no perceived risk of HIV/AIDs. Youth that takes alcohol and drugs are more likely compare to those who do not.

However for current use of condom, the odds of female decreases by 40% compare to male since the questions was centred on 'Do you still use male condom in the last 12month', the probability that female will use it is zero ($\beta = -0.516$ ε π0). An interesting thing is that marital status which has no significant association with the lifetime use of condom was significant in current use of condom. Youths who are not married are 3times more likely to current use condom compared to married youths. This shows that older youths who are married do not use condom to prevent pregnancy. Youths with multiple sexual partners are 3times more likely to be current condom users compare to youth with single partner and lastly those that take alcohol are significantly more likely compare to those who do not take at all.

Table 3 : Logistic regression of lifetime and Current use of condom by selected characteristics

	Lifetime use of condom			Current Use of condom		
	P> |z|	Exp(β)	95% CI for Exp(β)	P> |z|	Exp(β)	95% CI for Exp(β)
Aged 20-24	0.000*	3.87318	(3.19319, 4.69798)			
Rural	0.053	0.83075	(0.68864, 1.00218)			
North East	0.032***	1.79576	(1.05087, 3.06886)			
North Central	0.000*	5.61596	(3.55281, 8.87723)			
South West	0.000*	6.04396	(3.83958, 9.51393)			
South East	0.000*	3.50062	(2.12067, 5.77851)			
South south	0.000*	7.20155	(4.45901, 11.6309)			
Female	0.000*	0.59206	(0.49233, 0.71200)	0.004**	0.59664	(0.42000, 0.84758)
Married				0.000*	3.11070	(2.09880, 4.61049)
Primary	0.155	1.50018	(0.85797, 2.62311)			
Secondary	0.009**	1.97598	(1.18676, 3.29004)			
Tertiary	0.000*	3.59880	(2.06699, 6.26579)			
Christianity	0.000*	1.70773	(1.33539, 2.18390)			
Multiple partner	0.000*	2.57761	(1.92723, 3.44747)	0.000*	2.73494	(1.72287, 4.34153)
Low risk	0.012***	1.35267	(1.06791, 1.71335)			
High risk	0.282	0.74360	(0.43347, 1.27561)			
Alcohol intake	0.000*	2.44218	(1.83085, 3.25763)	0.014***	1.71632	(1.11695, 2.63732)
Drugs intake	0.485	1.31142	(0.61123, 2.81370)			

* Significant at 0.1%; **Significant at 1%; *** Significant at 5%

VI. Discussion

In spite of the high level on the awareness and knowledge of condom use around the globe, a greater proportion of youth still do not make use of it. According to Oyediran K.A., 2003, the effects of awareness of HIV/AIDS as a major determinant of condom use in Nigeria is the fact that the major motivating factor for condom use among monogamous married males was prevention of pregnancy and not prevention of STIs. This draws an alarm on the needs to encourage youths through health talk, media shows, public seminar/workshop and other awareness forum on the danger, benefit and usefulness of condom to their health. Though condom was design primarily for family planning purpose but as AIDs epidemic is on the increase in recent times, condom use play a vital role in AIDs prevention campaigns and it has been reported in research work that condom can reduce the risk of contacting HIV/AIDS. Also United Nations Population Fund (2007) confirmed that young people are at the centre of the HIV/AIDS epidemic in terms of rates of infection, vulnerability and of the 1.5 billion young people worldwide, 11.8 million are estimated to be living with HIV/AIDS. It is also reported that every day between 5,000 to 6,000 young people (ages 15-24years) contract HIV and that many of them still lack comprehensive and correct knowledge on how to prevent the infection.

This research found that all the respondents (100.0%) aged 15 to 24years had heard of condom which agrees with Omorepie, G., study while one quarter of the youth had use condom in their lifetime and the three- quarter of those who had used condom are current user. About 60% of the youth reported they have no risk perception of HIV/AIDS, 37% indicated low risk perception and 3% with high risk perception. This

was the main reason to examine if the use of condom depends on the background (demographic) charac-teristics. The chi square test of independence had reveals the association between lifetime use of condom and current use of condom with youth background characteristics and selected behavioural characteristics. Age group, location, geo-political zone, sex, Education level, religion, number of sexual partner, perceived risk of HIV/AIDs, alcoholic intake and drugs intake were found to be significantly associated with the lifetime use of condom while sex, marital status, number of sexual partner and alcoholic intake were found to be significantly associated with the current use of condom.

Modelling the relationship of significant individual independent variables to the outcome variable-lifetime use and older youths aged 20 – 24 years were 4times more likely to used condom compare to younger youths. Across the six geo-political zones; youth in the South South are 7times more likely to use condom in their lifetime compare to youth in North west, follow by South west (6times) and North Central youth who are six times more likely, also South East youth are about 4times more likely and lastly North East youth are 2times more likely to used condom in their lifetime. Female are less likely to used condom in their lifetime compare to male since the questions was centred on 'Have you ever used male condom', the odds that female will use condom is less likely (0.6times). The higher the education level, the more youths are likely to use condom that is youth tends to lifetime use of condom as they go higher in their educational attainment compare to youth who do not have any academic background. It was also observed that the odds of youth who practice Christianity is 2times more compare to Muslim youth. Youth with multiple sexual partners are more like compare to youth with single

partner. The odds of youth with high risk perception of contracting HIV/AIDS decreases by 25% though it is not statistically significant and youth with low risk perception of HIV/AIDs are significantly more likely to lifetime use of condom compare to youth that reported no perceived risk of HIV/AIDs. Youth that takes alcohol and drugs are more likely compare to those who do not. Thus, a logistic model was fit for the significant background and the selected behavioural characteristics.

However for current use of condom, the odds of female decreases by 40% compare to male since the questions was centred on 'Do you still use male condom in the last 12month', the odds that female will use condom is still less likely (0.6times). An interesting thing is that marital status which has no significant association with the lifetime use of condom was significant in current use of condom. Youths who are not married are 3times more likely to current use condom compared to married youths; this can be traced back to a study in Zimbabwe that measures the change in HIV prevalence and sexual behaviour between 1998 and 2003. This shows that older youths who are married are not current user of condom supported by Meekers et al., 2003. Youths with multiple sexual partners are 3times more likely to be current condom users compare to youth with single partner and lastly those that take alcohol are significantly more likely compare to those who do not take at all.

VII. Conclusion

Noticeably awareness and knowledge is not the hindrance but the low prevalence of lifetime use of condom can be traced to other numerous factors which the scope of this study cannot encompass. The background characteristics that are likely to enhance the use of condom for both lifetime use and current use differ. The lifetime use of condom was boost by all the demographic variables used except the marital status while current use of condom lean towards youth sex (gender), marital status, number of sexual partner and alcohol intake.

In order of eradicating HIV/AIDS, there is a need for sound education not watered one to the youths who are sexually active and Parents at large. Also, It will be a great phenomenon if Governments, Non- Governmental Organizations and other service providers place importance in dealing with the problem of HIV/ AIDS pandemic, especially sexually active youths in safe sex practice.

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Appendix
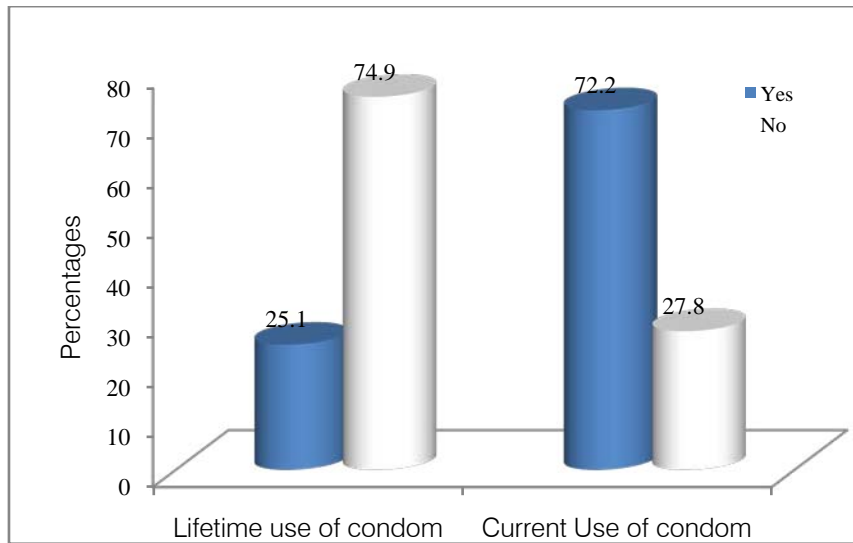
Figure 1 : Graphical representation of Lifetime and current use of Condom

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Small Bowel Atresia in Khartoum Teaching Hospital

ByDr. Elmutaz Eltag Sirelkhatim, Dr. Amir Abdalla Mohamadain & Dr. Aamir Abdullahi Hamza

Sudan Medical Specialization Board, Sudan

Abstract - Introduction: Intestinal atresia is a common cause of neonatal intestinal obstruction. Duodenal atresia occurs most properly due to failure of recanalization of the foregut, while jejuno-ileal atresia is due to intra uterine ischemia.

Objectives: To describe the pattern, clinical presentation, surgical treatment and outcome of bowel atresia.

Patients & Method: The study was Observational, analytic, hospital based study.

Result: Study of 40 patients with small bowel atresia showed that; more than 80% of patients were neonates, males: females' ratio was 1.4:1. Duodenal atresia was found in 27.5 % while jejunoileal atresia was found in 82.5% (57.5% was jejunal and 15% was ileal). All patients presented with vomiting most of them were bilious. Features of Dawn syndrome reported in four patients, all of them were duodenal (36%), cardiac anomalies occurred in 18% of duodenal atresia. Malrotation was found in three patients one was duodenal and two were jejunoileal. Prematurity occurred in 20% of patients, low birth weight was found in 45%.

Keywords : duodenal atresia, jejunal atresia, ileal atresia.

GJMR-K Classification : NLMC Code: WC 698, WI 460

SMALLBOWELATRESIAINKHARTOUMTEACHINGHOSPITAL

Strictly as per the compliance and regulations of:

Small Bowel Atresia in Khartoum Teaching Hospital

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Mortality rate was 32.5% due to multiple causes; cardiac anomalies, jaundice, prematurity and type of atresia were the commonest causes.

Conclusion: In our country lack of neonatal intensive care unit and total parenteral nutrition increases the mortality rate, availability of these things plus pre natal diagnosis will improve the outcome.

Keywords: duodenal atresia, jejunal atresia, ileal atresia.

I. Introduction

Atresia is a congenital disorder characterized by complete occlusion of bowel lumen. Stenosis refers to a partial occlusion with incomplete obstruction [1]. It is one of the three common causes of neonatal intestinal obstruction, the other two being Hirschsprung's disease and anorectal malformations [2]. The incidence of jejunoileal atresia is 1 per 5000 live births [3], while duodenal atresia has an incidence of about 1 per 5000-10,000 lives births [4].

Jejuno-ileal atresia (JIA) usually associated with gastro intestinal anomalies like malrotation, internal hernia & gastroschisis [5], on the other hand duodenal atresia (DA) commonly associated with systemic anomalies like Down's syndrome, cardiac and renal anomalies [6].

Jejunoileal atresia classified to 4 types as follow: type 1: is a mucosal (septal) atresia, type 2: a fibrous cord (band) separates both atretic segments, the mesentery is usually intact, and length of the intestine is normal. Type 3: has two sub-division: type 3a in this type of atresia, both blind ends are completely separated without a fibrous cord between them. The atresia has a V-shaped mesenteric gap, and the intestine is shortened, while in Type 3b (apple-peel deformity) Christmas-tree deformity, both intestinal segments are separated as in type 3a, and the mesenteric defect is large. In type 4: atresia refers to any number and combination of atresias type 1 to 3 [7]. Duodenal atresia has three types; type 1 just membrane or web it is the commonest, type 2 is fibrotic cord seperates proximal & distal bowel and type 3 is a complete separation of the atretic segments [8].

Patients with duodenal atresia usually presents with vomiting, most the time it's bilious, failure to gain weight, epigastric fullness, delayed passage of meconium & aspiration also may occur [9]. Presentation of jejunoileal atresia depends on the location of the obstruction, although the majority is present with bilious emesis, distal atresia is usually present with abdominal distention & delayed passage of meconium [9]. Polyhydromnias is frequently occur with small bowel atresia [10].

Prenatal diagnosis can be achieved in 46% of DA and 41% of JIA [9], double bubble and triple bubble is characteristic of DA and JIA respectively [11].

a) Objectives

To describe the patterns of small bowel atresia in Khartoum Teaching Hospital, study the clinical presentation, to know the modalities of surgery & outcome in patients with small bowel atresia and report the association with other anomalies & maternal diseases.

b) Patients & Method

The study was Observational, analytic, hospital based study it include 40 patients that were admitted Khartoum Teaching hospital department of Pediatric Surgery in the period between Sep. 2011 and May. 2013, Patients were referred from all parts of Sudan.

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Study variables included were age, gender, and residence, presenting symptoms, clinical sign and postoperative outcomes. Data was collected using a structured, pretested questionnaire and analyzed using a computer program-Statistical Package for Social Sciences (SPSS) version 20. Results were presented in tables and graphs.

II. RESULT

a) Patients characteristic

This study included 40 patients with small bowel atresia, mean age 47.0 (SD±150) days; it ranged 2- 900 days. The great majority of our patients 33 (82.5%) were neonate. Males were 23 (57.5%) and female 17 (42.5%) with a male to female ratio of 1.4:1. Of the neonates 21 (63.6%) were males.

b) Low birth weight and prematurity

The mean body weight was 2.8% (SD ± 1.2), in the range 2-8 kg. Eighteen (45%) of our patients were of low birth weight (weight less than 2.5 kg at birth). Prematurity was found in 8 (20%) patients that were born at less than 37 weeks' gestation.

c) Site and type of atresia

Distal atresia was the commonest of the small bowel accounting for 72.5% (jejunal 57.5 and ileal 15%) whereas duodenal atresia was seen in 11 (27.5%).

d) Classification of Jejuno-ileal type

Type 1 and type 2 were the commonest types of distal small bowel atresia accounting for 10 (34.5%) and 7 (24.1%) respectively. The other types ranged from 10- 17%.

e) Clinical presentation

The common presenting symptoms to our patients were; vomiting to all of them which was bilious almost to 39 (97.5%), Delayed passage of meconium 33 (82.5%) and constipation 26 (65.0%). Dehydration 32 (80.0%) and abdominal distension 27 (67.5%) were the major physical signs detected in addition to jaundice, wasting and visible peristalsis in varying percentage.

Common presentation of small bowel atresia that scoring greater than 70% in each of the three different types were found as follow: duodenal atresia (bilious vomiting, delayed passage of meconium and dehydration); jejunal atresia (bilious vomiting, abdominal distension delayed passage of meconium, constipation and dehydration) and ileal atresia (bilious vomiting, abdominal distension and constipation). The constipation and abdominal distension were significantly characterizing distal atresia with P values of 0.008 and 0.002 respectively. Polyhydromnias was occurred in 26 patients, six were duodenal (i.e. 54.5% of patients of DA) and twenty were jejunoileal (i.e. 69% of patients of JIA).

f) Similar condition in siblings and associate anomalies

History of similar conditions in siblings was noted in six patients (15%) while other congenital anomalies were evident in five patients (12.5%) and Down's syndrome was seen in four patients (10%). The association of Down's syndrome with duodenal atresia was found to be significant P value 0.003.Other congenital anomalies were found to be associated with duodenal atresia in four patients (80%) and jejunal atresia in one patient(20 %) and this as well was statistically significant P value 0.018. However, similar history in siblings was not significant for the type of small bowel atresia P value 0.362.

g) Investigations

Blood Anaemia was seen in two patients (05.00%), hypokalaemia in 11 (27.5%), hyponatraemia in a single patient whereas elevated blood urea and electrolytes in eight patients (20%).

h) Plain abdominal X-ray

This modality of investigation was done to all patients, it demonstrated air fluid level in 25 patients (62.5%) all of them were distal atresia 19 (76.0%) jejunal and 06 (24.0%) ileal, and this was found statistically to be significant (P value 0.000).Double bubble sign was significantly noted in 11 patients (27.7%) seven patients of them (63.6%) were cases of duodenal atresia and four patients (36.4%) were jejunal atresia (P value 0.005).

i) Treatment

After stabilization operative management was done to all patients, resection and anastomosis was the commonest operation performed 25 (62.5%), Duodenotomy and enterotomy were the least modalities of surgery to be done, each in a single patient. Other types of operation performed were duodenoduodenstomy, duodenojejunostomy and jejunoplasty. For patients with duodenal atresia, five (45.5%) ended with duodenoduodenstomy and a similar number with duodenojejunostomy. Resection and anastomosis was done to 19 (76.0%) jejunal and six (24.0%) ileal atresia. The modalities of surgery for the type of atresia was found to be significant (P value 0.000).

j) Outcome

Eighteen patients (45.0%) were discharged home in good general condition, morbidity was seen in eight patients (20.0%) and the mortality rate was 14 (35%).

k) Mortality

The majority of the deaths 10 (71.5%) were cases of jejunal atresia, three (21.4%) of duodenal atresia and a single case (7.1%) of ileal atresia.

Concerning the type of surgery, the peak of mortality after resection and anastomosis 8 (57.1%), three (21.4%) after duodenoduodenostomy, two cases (14.2%) of jejunoplasty and the rest of the mortality among the others.

III. Discussion

Small intestinal atresia is a major cause of intestinal obstruction especially in the neonatal period. This study was conducted in department of pediatric surgery in Khartoum Teaching Hospital between Sep 2011 to Aug 2013.

Our study of forty patients showed that; males were preponderance females (males: females = 1.4: 1). This is matching with other international studies [9, 12].

The ages of patients was extended from two days to three years, but more than 80% of cases were in the neonatal period, this is equivocal to other international series [12]. We found that prematurity was associated with 20% of patients, Thamar &et al found that prematurity was associated with 52% of JIA.

In current study jejunal atresia is the commonest type (57.5%) followed by duodenal (27.5%) & ileal (15%), Chirdanetal found in their study of 24 patients of bowel atresia that 19 were JIA, 5 were duodenal & 1 patient was colonic [12]. Sathyaprasad B etal in their study found same result that JIA was more common than duodenal [9].

On the other hand Hannah G etal in their study of 132 patients found that duodenal atresia is common than JIA [13], also Kate E etal reported same result [14]. So there is no commonest site of small bowel atresia.

Our study found that the commonest type of JIA was type 1(34.5%), and the least common was type 3b (10.3%), the second one was type 4 (24.2%), then type 2 (17.2%). In study that done in Iraq Waad M S etal reported that the commonest type of jejunoileal atresia was type I and occurred in (30%), the second was type IIIa occurred in (20%).The least frequent type was type IV (6%) [7].Other study done in Nigeria by Ekwunife O H etal showed that Type I atresia occurred with most frequency then type IIIb followed by type IV[15]. Type 1 seems to be the commonest type.

Vomiting was the commonest presentation in our, it occurred in all patients; it was bilious in all patients except only one with JIA, study that done by Hayrettin et al in Turkey found that vomiting occurred in all cases of duodenal atresia and in 21 out of 24 of JIA [16].

Abdominal distention occurred in 27 patients; 24 patients of them were jejunoileal and just 3 patients were duodenal (epigastric mainly). It is similar to literature series that found 23 patients of JIA out of 24 had abdominal distention and there was no distention in duodenal atresia [16].

Regarding passage of meconium, 24 patients of JIA (82.8%), nine patients of DA (81.8%) had delaying passage of meconium. in compare to international literature there is study reported that , 17 patients of JIA out of 24 had delayed passage of meconium, no patients of DA had delayed passage of meconium [16].

Jaundice occurred in two patients of DA (18%) and 11 patients of JIA (38%), this is similar to international study; Chirdanetal found that jaundice occurred in 20% (1 out of 5) of patients of duodena atresia [12], in JIA Waadetal in their study of 50 patients of JIA found that jaundice occurred in 15 patients (30%) [7].

Features of Dawn syndrome were found in four patients, all of them had DA they represented 36%of patients of DA. Rangsanetal in their study of 277 patients of congenital obstruction found that features of Dawn syndrome were found in 86 patients it equal 37.9%of patients which is similar to our result[17]. Mauricio Aetal found features of Dawn syndrome in 27% of their patients [18].

Congenital cardiac anomalies were found in two patients; both of them were duodenal equal 18.2% of patients of DA. Kate E etal in their study found that congenital heart disease were found in 12.3% of patients of DA [14]. In Mauricio Aetal study congenital heart diseases were found in 46 patients (27%) [18], Sathyaprasadetal found congenital heart disease in 49% of patients of duodenal atresia [9].

Malrotation was found in three patients; one was duodenal equal 9%, two were JIA equal 6.9%, in compare; it is near the results in international series that found malrotation in 8% of JIA and [9] .Hayrettin Oztruketal found that malrotation occurred in two patient out of 20 of DA(10%), and in three out of 24 patients of JIA (12.5%) [16].

We found that Polyhydromnias occurred in 54.5 % of DA, Diagnosis of the patients depend on clinical finding pluse plain abdominal x ray which was done in all patients, double bubble signs was found in seven patients of DA , also it was found in three patients of proximal jejunal atresia this is similar to international series[12]. Unfortunately pre natal ultra sound was not done.

DA was treated surgically by either duodenoduodenostomy which was done for six patients, one of them was failed and operated for the second time, or duodenojejunstomy which was done for five patients, the anastomosis is side to side diamond shape, it is the same international series [18, 12]. Duodenotomy was done for one patient of stenosis.

In JIA the most common operation used was resection of proximal part and end to end anastomosis it was done in 25 patients out of 29(86%) JIA.Waadetal used resection and anastomosis in 78% [7], Thamar H etal were used resection & anastomosis in 69% [5].

etal were used resection & anastomosis in 69% [5]. Tapering enteroplasty was done for three patients due short bowel length [12].

Enterostomy was done for patient with perforation & peritonitis, this is similar to which was reported by Thamar et al in their study [5]

Nineteen patients were discharged in a good condition (47.5%), prolonged ileus was occurred in 20% of patients, and two patients (5%) had wound infection (they died).

Mortality rate of the current study was 32.5, it's too much in compare to mortality rate in USA & Europe; Sathyaprasad etal in their study found that in 59 patients of DA mortality rate was zero, in 63 patients of JIA mortality rate was 11% (7patients) [9]. But our mortality rate is reasonable to some extent if it is compared with the mortality reports in studies that were conducted in developing country; Chirdan etal in their study of 24 patients of bowel atresia in Nigeria found that mortality rate was 41.7% [12].

IV. Conclusion

In our country lack of neonatal intensive care unit and total parenteral nutrition increases the mortality rate, availability of these things plus pre natal diagnosis will improve the outcome.

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Mother's Knowledge on Nutritional Requirement of Infant and Young Child Feeding in Mekelle, Ethiopia, Cross Sectional Study

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Abstract - Background: Nutrition is important part of child growth and development. Malnutrition still takes the lead in child mortality and morbidity. As Millennium Development Goal indicators no 1 and 4 is to reduce child mortality and improve nutrition respectively. A lot of children in this area have malnutrition and micronutrient deficiencies. That's why this research is motivated to assess mother's knowledge on infant and young child feeding and micronutrient.

Objective: This study is mainly aimed at assessing mother's knowledge on Infant and young child feeding which is a child feeding indicator developed by the World health organization. The study also assesses the mother's knowledge on micronutrient.

Keywords : breast feeding, complimentary feeding, indicators.

GJMR-K Classification : NLMC Code: WD 100, WS 113

MOTHERSKNOWLEDGEONNUTRITIONALREQUIREMENTOFINFANTANDYOUNGCHILDFEEDINGINMEKELLEETHIOPIACROSSSECTIONALSTUDY

Strictly as per the compliance and regulations of:

Mother's Knowledge on Nutritional Requirement of Infant and Young Child Feeding in Mekelle, Ethiopia, Cross Sectional Study

Amanuel Berihu α, Gerezgiher Buruh Abera σ, Hailemariam Berhe ρ & Kalayou Kidanu ω

Abstract- Background: Nutrition is important part of child growth and development. Malnutrition still takes the lead in child mortality and morbidity. As Millennium Development Goal indicators no 1 and 4 is to reduce child mortality and improve nutrition respectively. A lot of children in this area have malnutrition and micronutrient deficiencies. That's why this research is motivated to assess mother's knowledge on infant and young child feeding and micronutrient.

Objective: This study is mainly aimed at assessing mother's knowledge on Infant and young child feeding which is a child feeding indicator developed by the World health organization. The study also assesses the mother's knowledge on micronutrient.

Method: The study was conducted in Mekelle in two of its sub cities Kedamy Weyane and Ayder subcities. This cross-sectional study involves 541 mothers and multistage sampling design was used.

Result: The results revealed that average mean of mothers knowledge on vitamin A were .95 which is moderately knowledgeable and the knowledge average mean for mother's knowledge on Iodine were 1.02, and 0.7 for iron mothers average mean knowledge for breast feeding were 1.34, 1.22 for knowledge of the mother on food diversity. Knowledge on minimum food frequency the mother's average mean score were 0.85. There is also a mean knowledge difference among the monthly income and mother's educational level.

Conclusion and recommendation: Over all mothers had a moderate and slight knowledge on infant and young child feeding. Knowledge increases in parallel with educational and income level. Better knowledge enhancement is recommended by involving the mass media and the health care profession.

Keywords: breast feeding, complimentary feeding, indicators.

I. Introduction

a) Background

Nutrition is important part of child's growth and development. Especially the first two years of life are considered to be the window of opportunity where we can improve the wellbeing of a child.1 A child needs the right kind of nutrition in order to thrive and attain optimal development. As Millennium Development Goal No 4 indicators are to reduce child mortality rate, it should be supported by the standard practices of nutrition which is important in child survival, growth and development as well as MDG No1 to eradicate extreme poverty focusing on child nutrition. The Ethiopian Health care development program IV considers child health as a major priority. 3 To meet all of these goals we should consider mother's knowledge and practice on infant and young child feeding which is recommended by the WHO. 1

As a national public health recommendation, infants should be exclusively breastfed for the first six months of life to achieve optimal growth, development and health.7 After 6 months exclusive breast feeding and complimentary feeding should be initiated to supplement nutritional requirement. Mother's knowledge on exclusive breast feeding is not sufficient enough on mothers to demonstrate practically. Complementary foods should provide approximately 25-50% of total daily requirements and 75-100% for phosphorus, zinc and iron. 2

The mother hence the direct care giver of the child is responsible for fulfilling these requirements to accomplish this she should have the right kind of knowledge and should practice this accordingly. Improvements in infant and young child feeding could lower the number of under-5 year child deaths by nearly 18%6. If the mother has insufficient knowledge on this standard practices, it would possibly lead to irreversible the child will suffer form irreversible damage to the body and to the brain. This is where the gap exists. In an area where there is lack of resource in the nutritional requirement will be more hampered by lack of knowledge. Cognizant of the high prevalence of inappropriate child feeding practice, the Ethiopian government adapted the Infant and Young Child Feeding (IYCF) guideline in 2004. 1

b) Statement of the Problem

Malnutrition still takes the lead in child mortality and morbidity having 57% as a cause of mortality in children. Malnutrition poses a treat for health of children that are the futures of productive manpower. Ethiopia's

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under-five mortality rate in 2011was 88 per 1000 live births 3.Children are future of society and mothers are guardians of that future1.

A lot of children in this area have problems of malnutrition and deficiencies micronutrient. That's why the researcher is motivated to assess the knowledge and practice of mothers on these indicators. If the mother does not have the knowledge and is not practicing as required the child will suffer from health problems and growth and development delay.

As mention in EDHS 2011, infant and young child feeding (IYCF) indicators of breastfeeding status, 52 percent of children under six months and about half of children age 6-8 months (49 percent) consume solid, semi-solid, or soft foods. Almost seven children of every ten (66 percent) under the age of two receive age-appropriate breastfeeding3. Ninety-six percent of children continued breastfeeding at one year. Results show that only 4 percent of youngest children 6-23 months living with their mothers were fed in accordance with IYCF practices. More than nine children of every ten (96 percent) received breast milk or milk products during the 24-hour period before the survey, and half of the children (49 %) were feed at least the minimum number of times. Five percent of children were feed according to minimum standards with respect to food diversity (four or more food groups)3.

This study is aimed at assessing the knowledge of mothers on these five indicators that includes early initiation of breast feeding; exclusive breastfeeding under five months, introduction of solid, semi-solid or soft foods, minimum dietary diversity and minimum meal frequency. It also aims on assessing mother's knowledge on micronutrient.

Very few researches have been done addressing mothers knowledge and practice of this indicators in this part of the country. This research is one of its kinds trying to assess level of mother's knowledge on Infant and Young Child Feeding. The researcher expects from this study the information of these factors that determine the mother's knowledge and practice. And these findings were valuable addressing this issue and gaining the focus policy makers and resource allocators of health bureau and NGO organizations.

c) *Significance of the Problem*

Our country quest to be on the list of middle income countries is determined by having fully developed and optimal adults that is the child now. We can attain this if we have a child that is well nutritioned and the mother play a vital role for doing this so we should assess and identify if the standard practices are implemented and there is no knowledge gap in mothers. Studying these indicators has a public health importance of keeping the child healthy and to grow and thrive well. This study is also significant to all mothers, health worker, policy makers nursing and midwifery and health educators to disseminated information regarding Infant and young child feeding

II. Methods

The study was conducted in Mekelle capital city of Tigary region, Ethiopia. This city has administrative Weredas. There are 8 health centers 3 general hospitals and 1 referral hospitals. Mekelle have a total population of size of 289,756. The study was conducted from March up to June using community based cross - sectional study design. The source population of this study was mothers that currently resides in Mekelle city and that have a child less than 24 months.

Independent variable s includes Socio-Demographic Variables (Age, Marital status, House hold income, Mothers occupation, mother's educational status, Age of parity), Mothers characteristics (antenatal visits, place of delivery, exposure to media, mothers exposure to mother to mother support group and source of information) and Mothers knowledge on micronutrient. Outcome variables were Mothers knowledge on Infant and Young Child Feeding and knowledge on micronutrient.

The sample size determination was calculated using the single proportion formula. Households that have mothers less than 24 months were selected by simple random sampling. The questionnaire was distributed according to the proportion of the selected ketenas population.

Data was collected with structured questionnaire that was adapted from standard questioners and relevant literature reviews by using face to face interview. Five percent of the questionnaire was pretested before data collection relevance and applicability of the questioners. The data collectors were trained on how to collect the data and conduct the interview.

The data were edited, coded, entered in to a computer for cleaning and analysis using SPSS of windows version 20.0.0. Descriptive analysis on mean of mother and weighted mean followed by ANOVA was performed to the relative impact of predictor variables to the knowledge of feeding.

Ethical clearance was obtained from research committee at Mekelle University. Informed consent was read to the respondent before the interview. All information was kept private and confidential. Codes were given instead of the name for identifying the mothers. All mothers were told about the purpose of the study. Since this study is for the wellness of the child the interviewer gave education for the mother on the nutritional requirement and a child with obscured signs of nutritional deficiency was sent to the nearby hospital for further evaluation and every individual's right was respected.

III. Result

a) Socio-Demographic and Socio Economic characteristics

Out of the 541 responding mothers about 212 (32.9%) were on the age of 25-29 years. Majority of the mothers about 367(67.1%) of this mothers were not working currently. Concerning income about 124(22.9%) had an income greater than 1000. Fifty three percent about half of the sex of the respondent's children was male. (Table 1)

Table 1 : Socio-demographic characteristics and Socio- economic status of mothers and their children in Mekelle, Northern Ethiopia, March 2013

Variable		Number	Percentage (%)
Age of mother	15-24	197	36.4
	25-29	212	39.2
	30-49	132	24.4
Occupation status	Currently working	178	32.9
	Not working	363	67.1
Monthly income	<=500	84	15.5
	501-1000	68	12.6
	>1000	124	22.9
	Don't have income	57	10.5
	Don't know income	208	38.4
Level of education	no eduaction	84	15.5
	can read and write	36	6.7
	primary education	180	33.3
	secondary education	163	30.1
	college diploma and above	78	14.4
Sex of child	Male	290	53.6
	Female	251	46.4
Age of child	<=6	115	21.3
	7-12	189	34.9
	13-24	237	43.8
Age of mother at the time of delivery	16-24	228	42.1
	25-29	216	39.9
	30-49	97	17.9

Out of these children most of them about 237(43.8%) were on the age range of 13-24. Among mothers participated in this study 180(33.3 %) were on primary education 160(30.1%) were on the secondary education 84(15.5%) were with no education 78(14.4%) were with college diploma and the rest 36(6.7%) those who can read and write (Table 1)

b) Obstetrics and health service history of mothers

Out of 541 mother participated in this study 519 (95.9%) has followed antenatal follow up care and 354(65.4%) has followed antenatal care 4 times and above. Majority of this mothers about 355 (65.6%) delivered their child at hospital. Concerning number of children 410(75.8%) of mothers have only one child and 107(19.8%) of them have 2 children and 20(3.7%) have more than 3 children. (Table 2)

Table 2 : Obstetrics and health service distribution of mothers in Mekelle, Northern Ethiopia, April, 2013

Variable		Number	Percentage
Followed antenatal care	Yes	519	95.9
	No	22	4.1
Number of antenatal	1	1	.2
	2	8	1.5
	3	44	8.1
	4 and above	354	65.4
	Don't remember	113	20.9
Place of delivery	At home	51	9.4
	At health center	135	25.0
	At hospital	355	65.6

c) *Source information*

Result show on source of information only 37 (6.8 %) of the mothers do not watch, listen or read any sort of media. From those who watch, listen or read to media 290 (53.6 %) of them listen to radio 195(36.0 %) of them watch television and 19(3.5%) reads magazines or news paper. Thirty seven (six point eight percent) do not any of this media at home. (Figure 1)
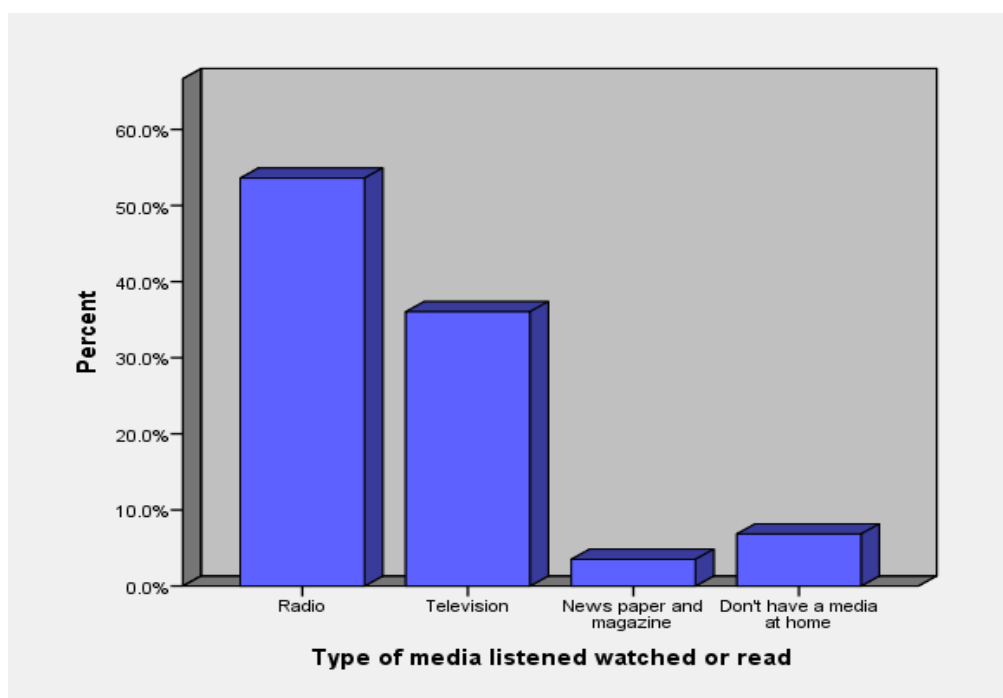
Figure 1 : Type of media watched, listened or read by mothers in Mekelle, Northern

Mother to mother support is also another major source of information for mothers on infant and young child feeding 24. On this study from the mothers participated in this study 366 (67.7%) of them do not have mother to mother support group in their area. Out of those who have support group in their area 175(32.3 %) only 95(54.3%) of them were involved in this support group. (Figure 2)
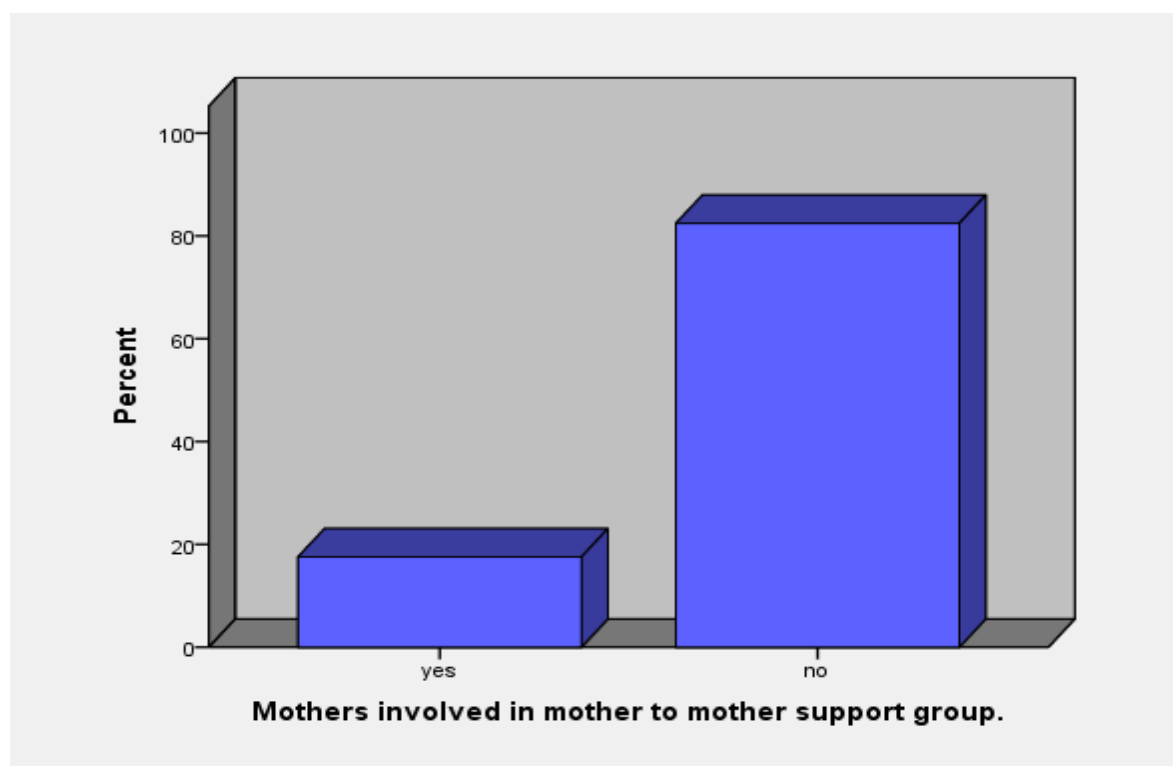
Figure 2 : Mothers involved in mother to mother support group in Mekelle, Northern Ethiopia, April 2013

In this study the result revealed that majority of the mothers get information of feeding their child form community health worker and nurses/midwifes which is 154(28.5%) and 145(26.8%) respectively.(Figure 3) The rest get the information from doctors 65(12%) health educators, auxiliary midwife, trained birth attendance, grandparents and elderly.
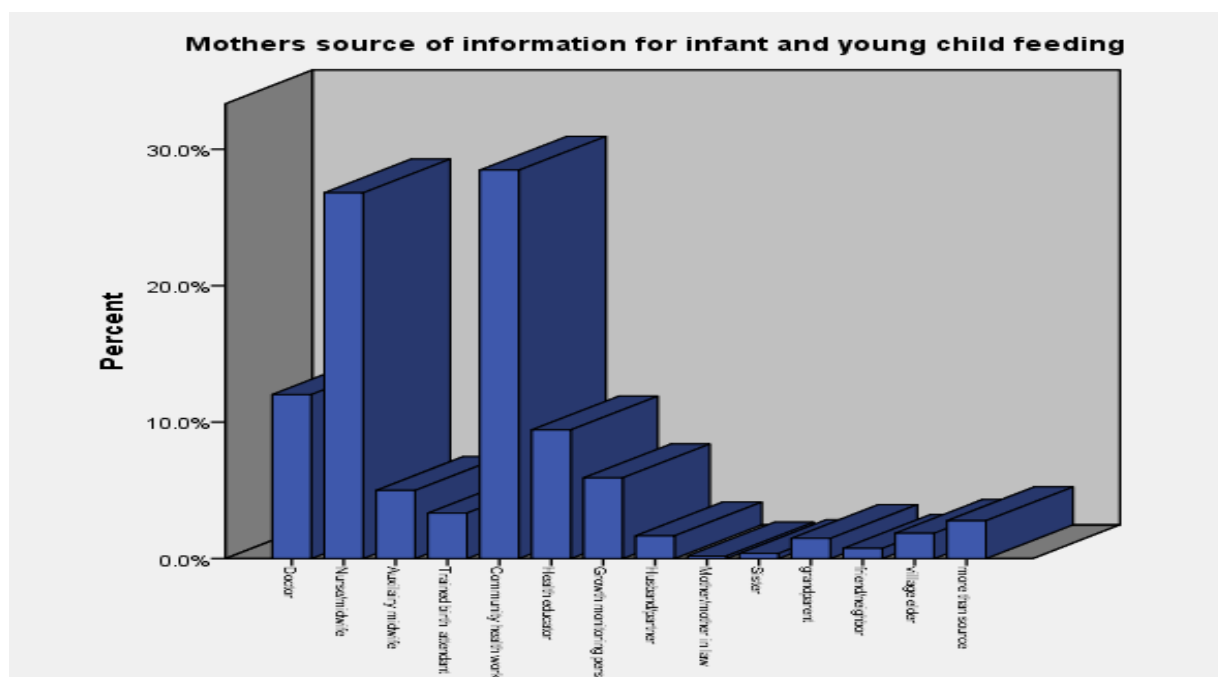
Figure 3 : Source of information on infant and young child feeding of mothers in Mekelle, Northern Ethiopia, April 2013

d) *Mother's knowledge on Micronutrient*

i. *Mother's knowledge on Vitamin A*

The average weighted mean indicated that mothers knowledge on vitamin A were moderately knowledgeable x =3.89. The weighted mean of mother knowledge on vitamin A were moderately knowledgeable on importance of vitamin A in diet(x=4.32+ 0.72) and vitamin A's importance on disease resistance(x=4.16 + 0.90). Mothers were slightly knowledgeable on vitamin A deficiency can cause growth retardation (x=3.77 + 1.13) and that egg and animal product contains vitamin A (x=3.74 + 1.07). (Table 3)Looking at whether there is difference between groups there is statistically significant difference between groups on the knowledge of importance of Vitamin A in diet, F(4, 536)=19.17, p=000.

Table 3 : Mother's knowledge on vitamin A in Mekelle, Northern Ethiopia, 2013

	Mean	VI	Std. Deviation
Importance of vitamin A	4.32	Moderately knowledgeable	.718
Vitamin A deficiency causes blindness	3.94	Slightly Knowledgeable	.947
Vitamin A deficiency causes night blindness	3.91	Slightly Knowledgeable	.996
Vitamin A deficiency causes bitot's spot	3.51	Slightly Knowledgeable	1.001
Vitamin As importance on disease resistance	4.16	Moderately knowledgeable	.906
Vitamin A deficiency causes growth retardation	3.77	Slightly Knowledgeable	1.134
Vitamin A is found in dark green leafed vegetables yellow colored fruits and yellow colored vegetables	3.79	Slightly Knowledgeable	1.070
Vitamin A is found in egg and animal products	3.74	Slightly Knowledgeable	1.073
Average	3.89	Slightly Knowledgeable	0.98

ii. Mother's knowledge on Iodine

Iodine which is also one of the most important nutrients is required by the child. In this study the mothers knowledge on iodine they were moderately knowledgeable that goiter is caused by iodine deficiency(x=4.22+ 0.90) and they were slightly knowledgeable on salt storage on dark and closed container(x=3.89+ 1.09). The average weighted mean of mother's knowledge on iodine was x=3.96(Table 4)

Table 4 : Mother's knowledge on iodine in Mekelle, Northern Ethiopia, April 2013

	Mean	VI	Std.Deviation
Goiter can be caused by iodine deficiency	4.22	Moderately knowledgeable	.904
Iodine deficiency can cause mental retardation	3.91	Slightly Knowledgeable	1.028
Salt should be added in to a stew before	3.87	Slightly Knowledgeable	1.360
Storing salt in dark closed container	3.87	Slightly Knowledgeable	1.087
Average	3.96	Slightly knowledgeable	1.09

iii. Mother's knowledge on Iron

Iron which is important for child's health and development is also part of the knowledge assessment of these mothers. The result discloses that mothers were slightly knowledgeable on the importance of iron for the child's health (x=3.67+ 0.99) and mothers were moderately knowledgeable on the less contents of iron whole cow's milk(x=3.84+ 0.94). (Table 5)

Table 5 : Mother's knowledge on Iron in Mekelle, Northern Ethiopia, April 2013

	Mean	VI	Std.Deviation
Iron deficiency and anemia	3.76	Slightly Knowledgeable	.97

Whole cow's milk is low in iron	3.02	Slightly Knowledgeable	1.15
Importance of fruit for iron absorption	3.84	Slightly Knowledgeable	.94
Importance of iron for child health	4.06	Moderately knowledgeable	.93
Average	3.67	Slightly Knowledgeable	0.99

e) *Mothers knowledge on infant and young child feeding*

i. *Mother's knowledge on breast feeding*

Immediate initiation of breast feeding is recommended after birth. In this study mothers were moderately knowledgeable on immediate initiation of breast feeding (x=4.65+ 0.75). Mothers were moderately knowledgeable on exclusive breast feeding (x=4.16+ 1.06) as well. (Table 6)

Table 6 : Mothers knowledge on breast feeding in Mekelle, Northern Ethiopia, April 2013

	Mean	VI	Std. Deviation
Immediate Initiation of breast feeding	4.65	Moderately knowledgeable	.752
Colostrums should be fed to child	4.65	Moderately knowledgeable	.813
Breast feeding at least 8 times a day	4.42	Moderately knowledgeable	.926
Crying as a sign of hunger	3.77	Slightly Knowledgeable	1.247
Exclusive breast feeding	4.16	Moderately knowledgeable	1.064
Average	4.25	Moderately Knowledgeable	1.01

ii. *Mothers knowledge on food diversity and minimum food requirement*

In the mean result tells us that mothers were moderately knowledgeable on the initiation of complimentary feeding(x=4.47+ 0.83). Mother's knowledge the seven food groups that a child should have as a complimentary feeding as part of the infant and young child feeding has been assessed. They were moderately knowledgeable that a child should have grains, roots and tuber as a complimentary feeding(x=4.45+0.68) to slightly knowledgeable on flesh foods as complimentary feeding (x=3.59+ 1.28). (Table 7)

Table 7 : Mother's knowledge on complimentary feeding and diversity of food in Mekelle, Northern Ethiopia, April 2013.

	Mean	VI	Std.Deviation
Initiation of complimentary feeding	4.47	Moderately knowledgeable	.831
Knowledge on feeding Grains, roots and tuber as a complimentary feeding	4.45	Moderately Knowledgeable	.691
Knowledge on feeding Legumes and nuts as a complimentary feeding	3.97	Slightly Knowledgeable	1.004
Knowledge on feeding Dairy products (milk, yogurt, cheese) as a complimentary feeding.	4.03	Moderately Knowledgeable	1.035
Knowledge on feeding Flesh foods (meat, fish, poultry) as a complimentary feeding	3.59	Slightly Knowledgeable	1.280
Knowledge on feeding Eggs as a complimentary feeding	4.39	Moderately Knowledgeable	.764
Knowledge on feeding Vitamin-A rich fruits and vegetables as a complimentary feeding	4.39	Moderately Knowledgeable	.901
Knowledge on feeding Other fruits and vegetables as a complimentary feeding	4.37	Moderately Knowledgeable	.825
Average	4.18	Moderately knowledgeable	.94

Mother's knowledge on food frequency for children in this study tells us that they were slightly knowledgeable on feeding a child of 6-8 months at least 2 times a day (x=3.66+ 1.32) and having mean score of 4.03 and standard deviation of 1.17 the mother is moderately knowledgeable on feeding a child of 9-23 months at least 3 times a day

Table 8 : Mother's knowledge on food frequency of child 6-8 months and 9-23 months in Mekelle, Northern Ethiopia, April 2013

	Mean	VI	Std.Deviation
Feed a child of 6-8 months at least 2 times	3.66	Slightly Knowledgeable	1.319
Feed a child of 9-23 months at least 3 times	4.03	Moderately knowledgeable	1.173
Average	3.84	Slightly Knowledgeable	1.24

f) *Mother's knowledge on infant and young child feeding and level of education*

The analysis of variance has been whether a knowledge difference exists on the frequency of breast feeding a child with education level of the mothers. There were no outlier and data was normally distributed for each group as assessed by box plot and Shapiro-wilk test (p<.05) respectively. Of variance assessed by using Leven's test and the homogeneity variance was violated (p=1.32). There were statically significant difference between groups F(4,535)= 4.29, p= 0.002.

The other analysis of variance tested was whether there is a knowledge difference on initiation of complimentary feeding. There was no outlier and the data was normally distributed and the assumption on homogeneity of variance was kept (p=0.007). There were statically significant difference between groups F (4,532) =7.91, p=.000. Using Tukey post hoc test that the mean score on the knowledge on initiation of complimentary feeding were significantly mother on primary education were less knowledgeable than mothers with no education mean difference, standard error and significance level reservedly -.301, 0.103, p=0.030.

There is also complimentary feeding knowledge mean difference of mothers that can read and write were less knowledgeable than mothers that have primary education -0.718, 143, p=000. There is also mean difference of mothers that can read and write were less knowledgeable than mothers that have secondary -0.593*, 0.144, p=0.000

Table 9 : Mother knowledge on infant and young child feeding and difference in the level of education in Mekelle, Northern Ethiopia June 2013

ANOVA						
		Sum of Squares	df	Mean Square	F	Sig.
Frequency of breast feeding	Between Groups Within Groups Total	13.653 449.770 463.423	4 536 540	3.413 .839	4.068	.003
Child should be feed grains, tubers and roots	Between Groups Within Groups Total	8.915 249.037 257.952	4 536 540	2.229 .465	4.797	.001
Child should be feed vitamin-A rich fruits and vegetables	Between Groups Within Groups Total	12.491 425.993 438.484	4 536 540	3.123 .795	3.929	.004
Child should be feed other fruits and vegetables as	Between Groups Within Groups Total	21.596 345.938 367.534	4 536 540	5.399 .645	8.365	.000
Feed a child of 9-32 months at least 3 times a day	Between Groups Within Groups Total	18.991 723.593 742.584	4 536 540	4.748 1.350	3.517	.008

Mothers knowledge that a child should be breast feed at least 8 times a day ANOVA yields significant variation among mothers educational status F(4, 536)= 4.06,p=0.003. Tukey HSD showed that mothers with college diploma(x=4.52), secondary education (x=4.47) and primary education (x=4.44) are more knowledgeable that mothers that can read and write x= 3.89.

Mothers knowledge that a child should be feed grain roots and tubers there was a significant group difference F(4,536)=4.80,p=0.001 Tukey post hoc test shows that mothers that have secondary school educational status (x=4.58)are more knowledgeable than mothers with no education(x=4.25) or mothers that can read and write (x=4.19).

On mothers knowledge that a child should be feed vitamin A rich fruits mothers was a significant group difference F(4,536)=4.80,p=0.004. Mothers that have secondary school educational status (x=4.53)are more knowledgeable than mothers with no education(x=4.14) or mothers that can read and write (x=4.08).

Mother knowledge on Infant and young child feeding and level of income

Table 10 : Mother knowledge on infant and young child feeding and difference in the level of income in Mekelle, Northern Ethiopia June 2013

ANOVA							
Level of income and mother's knowledge		SS	df	MS	F	Sig.	
Frequency of breast feeding	Between Groups	15.35	4	3.839	4.645	.001	Significant
	Within Groups	442.21	535	.827			
	Total	457.57	539				
Child should be feed grains, tubers and roots	Between Groups	8.310	4	2.077	4.675	.001	Significant
	Within Groups	237.71	535	.444			
	Total	246.02	539				
Child should be feed legumes and nuts	Between Groups	22.035	4	5.509	5.806	.000	Significant
	Within Groups	503.846	531	.949			
	Total	525.881	535				
Child should be feed dairy products	Between Groups	18.608	4	4.652	4.642	.001	Significant
	Within Groups	532.131	531	1.002			
	Total	550.739	535				
Child should be feed eggs	Between Groups	7.281	4	1.820	3.407	.009	Significant
	Within Groups	284.756	533	.534			
	Total	292.037	537				
Child should be feed vitamin-A rich fruits and vegetables	Between Groups	7.629	4	1.907	2.638	.033	Significant
	Within Groups	384.594	532	.723			
	Total	392.223	536				
Child should be feed other fruits and vegetables as	Between Groups	6.745	4	1.686	2.619	.034	Significant
	Within Groups	343.800	534	.644			
	Total	350.545	538				
Feed a child of 6-8 months at least 2 times a day	Between Groups	34.001	4	8.500	5.065	.001	Significant
	Within Groups	896.217	534	1.678			
	Total	930.219	538				

There a significant income group difference of mothers on the knowledge that a child should be feed at least 8 times a day so the null hypothesis is rejected at F(4,535)=4.64, p=.001. A significant income group difference also exists on feeding a child with grains, roots and tubers as a complimentary feeding so the null hypothesis is rejected at F(4,535)=4.67, p=.001. Mother's knowledge on feeding a child legumes and nuts as complimentary feeding have also a statically significant group difference of income F (4,531) =5.86),p=000. The other statically significant income group difference exists on mothers knowledge on feeding a child dairy products and egg as a complimentary group difference so the null hypothesis is rejected at F(4,531)=4.64,p=001 and F(4,533)=3.40,p=.009 respectively.

There is also statically significant difference between income groups regarding mother's knowledge of feeding a child vitamin A rich fruits and vegetable so

the null hypothesis that there is no knowledge difference of mothers in the income group is rejected at F(4,532)=2.63,p=0.03. Mother's knowledge on feeding a child other fruits and vegetable is also statically significant group difference so the research hypothesis is accepted at F=(4,534)=2.62,p=.034 . Finally there is a significant group difference of mothers knowledge on feeding a 6-8 month child at least 2 times a day (minimum food frequency) so the null hypothesis is rejected at F=(4,534)=5.06 ,p=.001.(Table 9)

IV. Discussion

The purpose of this study were to assess mothers knowledge on infant and young child feeding and to test the hypothesis that there is no knowledge difference between mothers socioeconomic and socio demographic characters these were the level of income and level of education.

This study have used the cross-sectional study design and used the mean value to indicate mothers knowledge used and multivariate analysis which is the analysis of variance at 95% confidence interval and p=0.05 to check whether knowledge difference prevails in the mothers with their educational level. But some of the studies listed have used Pearson's correlation Coefficient19, Spearman's Chi square test 20, 21were used.

Unlike in our study the educational status in study conducted at Mosul city revealed that less than one half (44%) of mothers age falls within 25-34years.One tenth (12%) of mothers were illiterate and 20% of them have no formal education certificate. Almost one quarter (24%) of mothers have primary education certificate and the same fraction (24%) were with higher education19comparing this to our study mothers participated 180(33.3 %) were on primary education 160(30.1%) were on the secondary education 84(15.5%) were with no education 78(14.4%) were with college diploma and the rest 36(6.7%) those who can read and write. Most of the mothers are at the primary school level. In study conducted at Pakistan, Jamshoro mother educational status 312 (62.2%) were illiterate.21

As in our study the study conducted Gölbaşı town center of Ankara city, Turkey the investigation of mean knowledge scores and education levels revealed that knowledge scores increased in parallel with the education level, which was found statistically significant (literate x = 14.36±2.54, primary school graduate = 15.64±2.01, secondary school graduate x x = 15.75±1.92, high school graduate x = 16.61±1.89, university or master's degree holder x =17.00±1.75. 22

Seeking antenatal care is important as a source of information, out of 541 mother participated in this study 519 (95.9%) has followed antenatal follow up care but in national nutritional survey in Pakistan results showed that only 63.5 % of pregnant women sought ANC during pregnancy.23

As in this study 355 (65.6%) delivered their child at hospital, and a study in Gaza revealed 224(83.6%) delivered at home.5

In our study majority of the mothers about 367(67.1%) of this mothers were not working currently and the study conducted at Mosul city about two thirds of studied mothers (70.0%) were housewives and only one third(30.0%) were employed 19

In our study mothers about 212 (32.9%) were on the age of 25-29 years where as in this study conducted at Jamshoro, Pakistan mothers 324 (64.8%) were between the ages of 21 - 30 years. While below 21 years were 60 (12%), and above 35 years were 39 (7.8%).21

In our study on number of children 410(75.8%) of mothers have only one child and 107(19.8%) of them have 2 children and 20(3.7%) have more than 3 children and in this study conducted and Mosul city number of

children 20.0% of the included mothers have 2-3 children, and 20.0 % have more than five children.19 In the study conducted at Jamshoro, Pakistan mothers 231(46%) mothers had < 3 children, while 269 (53.8%) mothers had 3 or > 3 children.21

In the study conducted at Jamshoro, Pakistan regarding the source of knowledge for infant feeding, in 390 (78%) CF was advised by family members while in 110 (22%) by doctors and health workers. Regarding mothers perception of C F, it was essential in 456 (91.2%), while 44 (8.8%) mothers considered it not essential.21 In this study the result revealed that majority of the mothers get information of feeding their child form community health worker and nurses/midwifes which is 154(28.5%) and 145(26.8%) respectively. The rest get the information from doctors 65(12%) health educators, auxiliary midwife, trained birth attendance, grandparents and elderly.

In the study conducted at Mosul city infant feeding shows the value of odds ratio(OR), 95% confidence limit interval (95% CT) and P- value : mothers with higher educational level (OR=0.429 , P = 0.050). 19 Where knowledge of infant feeding also increase with educational status as our study revealed initiation of complimentary feeding were significantly higher mother on primary education than mothers with no education mean difference, standard error and significance level reservedly -0.301, 0.103, p=0.030. In this study mothers were moderately knowledgeable on immediate initiation of breast feeding and in the study conducted in Jamshoro, Pakistan regarding the knowledge of breast feeding practices (66-80%) mothers were well informed.21

Mother knowledge on Vitamin A most of the mothers where moderately knowledgeable and slightly knowledgeable(Table 3) The majority of the respondents were able to correctly identify dark green leaves (92%), yellow fruits (85%), yellow-colored vegetables (82%) and animal products like egg, fish and meat (82%) as good sources of vitamin A20.

In our study knowledge regarding Iodine mothers was slightly knowledgeable and moderately knowledgeable (table 4) and in the study conducted at Weeraketiya DS division Sri Lanka the knowledge of the subjects regarding the iodine nutrition was not satisfactory. Although about 74% of the respondents knew that the goiter was caused by iodine deficiency only 6% knew that it was food related .20

Mothers were slightly knowledgeable on the importance of Iron for child's health unlike in this study conducted at Weeraketiya DS division Sri Lanka only 74% of the mothers have heard or known about anemia as shortage of blood and others (26%) did not know about it.

Mother's knowledge regarding breast feeding was they are moderately knowledgeable. This could be

related to the fact that most of mothers get their information from community health worker and nurses. Mother in our study mothers had good knowledge compared to the study conducted in adolescents in Gonder. Adolescents' attitudes and knowledge towards early child feeding behaviors deviated substantially from the current international recommendation that infants be exclusively breastfed for the first six months a large majority (75%) also believed that infants should be consuming some water by 1 month 6

In the same study conducted in Gonder mothers attitudes and knowledge regarding complementary feeding also deviated from current international recommendations and 'best practices" 38% of adolescents agreed that a 6 month old infant should be consuming these items. Fewer (27%) agreed that children should be consuming animal source foods at 6 mo. Very few girls responded "don't know." 6. In our study mother's knowledge on complimentary feeding initiation of complimentary feeding and food diversity were moderately knowledgeable with mean score of 1.22 this could be also do the large number of mothers get their information form health professionals.

V. LIMITATION AND STRENGTHS

a) Strength

The strengths of this study were it have assessed the mothers knowledge on both infant and young child feeding and micronutrients

b) Limitation

The study doesn't include practice of mothers on infant and young child feeding.

VI. CONCLUSION

In a general sense, it can be said that mothers included in the study had a good level of nutritional knowledge. It is considered that the training given by health care centers contributed to this situation. Mothers didn't have mother to mother support groups in their area. Even for those that have this support group the involvement is about half percent.

The knowledge scores increase in parallel with the educational level, which revealed the importance of education. Knowledge also increases with differs with the level of income. But mother knowledge regarding Vitamin A and iron were lower. Mothers were also lower compared with the other IYCF indicators.

VII. RECOMMENDATION

Mass communication and media, non-governmental organizations, universities, policy makers and various other institutions should work together in nutritional education. It will be useful to provide an effective and persistent nutritional education and active involvement could enhance a better outcome.

Nurses and midwifery should also be engaged in improving mother knowledge on this guideline so that there will be a well nutritioned and healthy child. Further research could also be done including that includes practices of mother on infant and young child feeding.

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Work Environment Noise Levels and Risk Locations in Two Selected Commercial Areas in Ibadan, Nigeria

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Results: The highest mean noise levels in Agbowo (93.7 dB) and Ajibode (90.3 dB) was obtained around 11am-1pm on Wednesday and Saturday respectively. In Agbowo; Enclosed location had the highest mean noise level (98.7dBA) as compared to road side location in Ajibode (81.7dBA).

Keywords : noise pollution, electric generators, work environment.

GJMR-K Classification : NLMC Code: WA 776

WORKENVIRONMENTNOISELEVELSANDRISKLOCATIONSINTWOSELECTEDCOMMERCIALAREASINIBADANNIGERIA

Strictly as per the compliance and regulations of:

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Yesufu Alegbema Luqman [α], Ana Godson Rowland [σ], Yawei Zhang [ρ] & Umar Olufunke Zainab [ω]

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Conclusion: Public enlightment on use of ear plugs and ear muffs while working in this commercial areas is advocated.

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I. Introduction

Noise is derived from the Latin term nausea. It is an inescapable part of everyday life and can be defined by various ways, but essentially it can be described as "wrong sound, in the wrong place at the wrong time" (Thompson, 1994). A major distinction between sound and noise is that sound is regarded as noise when it becomes a source of inconvenience to another individual. Noise is a number of tonal components disagreeable to man and more or less intolerable to him because of the discomfort, fatigue, disturbances and, in some cases, pain it cause (Singh and Davar, 2004).

Noise originates from human activities, especially during urbanization and the development of transport and industry. Noise is becoming an increasingly omnipresent, yet unnoticed form of pollution even in developed countries. According to Brigitte and Lindvall (1995), road traffic, construction equipment, manufacturing processes, and lawn mowers are some of the major sources of these unwanted sounds that are routinely broadcasted into the air.

Increase in vehicular traffic is a source of noise pollution around the globe especially in most urban cities around the world. Traffic related noise pollution accounts for nearly two-third of the total noise pollution in an urban area (Birgitta and Lindvall, 1995), other sources include jet planes, garbage trucks, construction equipments, manufacturing processes and lawn mowers. Any sound which is annoying or level of sound exceeds 75 dB (A) may be conceived as noise. The threshold for noise annoyance varies. It depends on the conditions, including the sensitivity and mental state of an individual (Mokhtar et al., 2007). Generally, noise can create negative emotions, feeling of surprise, frustration, anger and fear.

According to Maduemezia (2002), noise pollution is one aspect of environmental pollution that is taken rather lightly in Nigeria. He asserted that greater part of the sources of noise in the society is of a social origin. However, noise, as a polluting agent in the environment, has been recognized in recent years as a serious threat to the quality of life enjoyed by people in most industrialized nations (FTA, 1995). In developing nations, however, noise pollution has not been seen as dangerious and having adverse effect on the life of the people (Abumere et al., 1999). This is probably the reason why not much research into environmental noise pollution has been carried out within Nigeria cities.

Electric energy occupies the top grade in energy hierarchy as it finds innumerable uses in homes, industry, agriculture, and defense and of course in some nations, transportation. Nigeria's electricity power situation is very poor because of erratic power supply. As a result there is an upsurge in the use of electricity generating plant with its attendant noise pollution on the environment and human health (Akande and Olonge, 2001). Most workplaces and homes use generating plants 24 hours in alternative to power supply. The noise

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from generated plants in Nigeria coupled with its accompanying smoke emission to the sky which has greatly contributed to the breaking of the ozone layer in the sky (Deepak, 2009).

Occupational noise is considered to be a major cause of adult-onset hearing loss worldwide (Nelson, 2005). Workers across the world are at risk of hearing loss due to the presence of a high level of noise at their workplaces (Verbeek et al., 2009). In USA, more than 30 million workers (almost 1 in 10) are exposed to unsafe noise levels on the job (McReynolds, 2005). In Europe, about 35 million people are exposed to detrimental noise levels (> 85 dB-A) in industrial plants (Sulkowski et al., 2004). A recent study in Nigeria reported high levels of occupational noise (>90dB) among traders and 100% of workers exposed for a period of 14 years developed hearing impairment (Ighoroje et al., 2004 and Bisong et al., 2004).

However, the Federal government of Nigeria formed the Federal Environmental Protection Agency (FEPA) back in 1990 and entrusted it with the responsibility of law formulation, control and regulate impact of noise in the country (FEPA, 1991). Unfortunately, the impact of FEPA is yet to be felt (Onuu, 1999). Very few reports of noise pollution studies are available in Nigeria. This study is considered necessary because it would allow a comparison of the measured levels with known levels already considered safe for man according to WHO guideline limit. According to this guideline, the recommended noise levels in commercial environment should be 65-70 dB (A).

Therefore, an assessment of the work environment noise levels and development of risk map for noise in these commercial locations would help focus future government interventions in the area of noise abatement in these areas. Furthermore, it would serve as information for people working in these areas so as to take necessary precaution towards protecting themselves from the adverse effect of noise

II. Materials and Methods

This study was conducted in Agbowo and Ajibode business areas of Ibadan, Nigeria after proper compulsory ethical review by the University of Ibadan (UI) and University College Hospital (UCH) Ethical review committee, Ibadan. Participants in these business locations were duly informed and consent was obtained. This study also went through proper required institutional review board procedures at the College of Medicine, University of Ibadan prior to its initiation.

a) Study Design

A comparative cross-sectional design was used which involved repeated field measurements of environmental noise levels at specific recorded geographical coordinates and the development of risk map for noise using the google earth software package.

b) Study Area

Agbowo and Ajibode are both located in Ibadan, the capital of Oyo State in Nigeria. Ibadan, one of the largest metropolitan cities in West Africa, is a primarily indigenous city with millions of inhabitants, most of which are Yoruba; other ethnic groups constitute smaller proportions of the population. The Agbowo business area is situated directly opposite the University of Ibadan and is a high commercial activity area encouraging small scale businesses (Tomori, 2006). The Ajibode business area is also at close proximity to the University of Ibadan campus, but experiences relatively lower daily business activity.

c) Study Site

The shops in Agbowo and Ajibode were each classified into three similar study sites based on the nature of the surrounding environment, they include; enclosed shops (EC), roadside shops (RSS) and single street shops (SSS). This was done to ensure that noise all other environmental noise sources were put into consideration.

d) Survey

An observational checklist was used to collect data on other environmental noise sources located outdoors and indoors in the classified locations as stated above. Information on the number of shops and workers were also obtained using the observational checklist. (Data not reported).

e) Traffic Density Estimation

This was obtained by manually counting the number of vehicles every 15 minutes within a one hour time interval between 6-8am, 11am-1pm, and 4-6pm. The obtained number is then multiplied by 4 to obtain the hourly traffic density. Information on the types of automobiles observed in Agbowo and Ajibode were also noted.

f) Noise Measurements

The environmental noise levels in the classified locations were measured using a factory calibrated TECPEL Model 330 series sound level meter (SLM), which was set at the slow response mode with A-weighting (A-weighted decibels or dBA). Measurements obtained was compared with the International norms (WHO recommended sound levels) . Measurements were obtained at three sampling points outdoors (identified hereafter as L1, L2, and L3) within each of the surveyed business locations. Three complete sets of sound level measurements were taken:

- One complete set of measurement before the start of commercial activity (6-8am).
- One complete set of measurement at the peak of commercial activity (11am - 1pm).
- One complete set of measurement at the close of commercial activity (4-6pm).

i. *Frequency of Noise Measurements*

Noise readings were obtained at 10 minute Intervals. The outdoor noise level measurement was carried out for three days weekly for a period of three months for both groups. Noise levels were obtained from sampling points L1, L2 and L3 on Monday, Wednesday and Saturday.

ii. *Noise Measurement at Worker Position*

A noise assessment form was used to obtain information on the hours spent at work as well as the noise level at the position of worker. A sound meter was positioned at 10 and 30cm from the worker's ear to obtain the actual noise level filtering into the ear. The sound level meter was set at slow and measurements were done in A-weighting scale. The noise levels obtained at 10cm and 30cm were summed and the average was obtained as the mean noise level at which the worker was exposed to at work.

g) *Development of Risk Map for Noise in the Classifed Business Locations*

A hand-held, battery-powered factory calibrated gamin GPS was used to determine the geographic coordinates of the sampling points in classified locations in Agbowo (AG1-AG3) and Ajibode (AJ1-AJ3) for noise level assessment. The coordinates of the locations which appeared on the display screen of the GPS after signal is acquired from the satellite in space were recorded and then inserted into a Google Earth Software package to develop the risk map. The risk map was interpreted based on the mean noise level measured for each of the classified commercial locations in Agbowo (AG1, AG2 and AG3) and Ajibode (AJ1, AJ2 and AJ3).

High Risk	80 – 90 dB(A)
Medium Risk	70 – 80 dB(A)
Low Risk	60 – 70 dB(A)

h) *Statistical Analysis*

Data were entered into Microsoft Excel and then managed and analyzed using the Statistical Package for Social Sciences (SPSS) version 15. Data were analyzed using descriptive statistics, Chi-square, T-test, MANOVA and logistic regression with a 5% level of statistical significance.

III. Results

a) *Identified Environmental Noise Sources*

In Ajibode, all three classified locations (AJ1-3) recorded low number of generators as compared to Agbowo where AG1 and AG2 recorded the presence of greater than 25 generators. Other noise sources such as music recording houses, automobile and motorcycles and religious centres showed variation in their numbers across the classified locations in Agbowo and Ajibode commercial areas. See table 3.1 for details.

b) *Traffic Density Estimation*

A significant difference in the number of vehicles across the sampling time frame were observed for Agbowo and Ajibode commercial areas respectively. Generally, Agbowo had high traffic counts/hour (2760, 3175, 3992) across the sampling time frame as compared with medium range traffic counts/hour in Ajibode (804, 819, 694). Automobiles observed included; Motorcycles, cars, trucks and buses but variation occurred in the density/volume. See Table 3.2 for details.

c) *Noise Measurements*

The mean noise level in Agbowo was 78.5 ± 3.9 dB (A) which significantly exceeded the WHO standard (60-70 dBA) as compared to the mean noise level in Ajibode 65.7 ± 4.4 dB (A).

i. *Daily Noise Levels*

At 6-8am; the highest mean noise levels recorded in Agbowo (70.5dBA) and Ajibode (60.8dBA) were obtained on Saturday and Wednesday respectively. At 11am-1pm; the highest mean noise levels recorded in Agbowo (93.7 dB) and Ajibode (90.3 dB) were obtained on Wednesday and Saturday respectively. At 4-6pm; the highest mean noise levels recorded in Agbowo (80.8 dBA) and Ajibode (82.8 dBA) were both obtained on Wednesday. See Figures 3.1, 3.2 and 3.3

ii. *Noise Levels per Location*

In Agbowo; Enclosed location had the highest mean noise level (98.7dBA) as compared to roadside (80.4dBA) and street (69.2dBA) locations. In Ajibode; Roadside location had the highest mean noise level of 81.7dBA as compared to Enclosed (98.7dBA) and Street (72.8dBA) locations. See figure 3.4 for details.

Table 1.0 : Major Sources of Environmental Noise in Classified locations in Agbowo and Ajibode

Commercial Area	Location	Number of electric generators	Sources of Noise		
			Car	Music Houses	Motorcycles
Agbowo	AG1	≥ 25	Low	High	Low
	AG2	≥ 25	High	None	High
	AG3	< 25	Low	Low	Low
Ajibode	AJ1	< 25	None	Low	None
	AJ2	< 25	Low	None	High
	AJ3	< 25	Low	High	Low

Table 2.0 : Traffic Counts (density) during sampling period

LOCATION	TYPES	6am – 8am		11am – 1pm		4pm – 6pm		p-value
		Mean	SD	Mean	SD	Mean	SD	
Agbowo	Motorcycle	951.6	482.3	1397.1	651.6	1571.4	789.6	P=0.000 p<0.05
	Cars	1423.4	705.6	1829.8	514.1	2001.2	554.2	
	Truck	32.9	20.1	84.9	50.71	47.6	24.2	
	Buses	351.7	135.7	403.8	167.8	373.4	125.0	
Ajibode	Motorcycle	201.7	69.7	550.5	201.2	222.9	150.7	P=0.000 p<0.05
	Cars	564.2	221.4	177.3	60.9	409.8	150.6	
	Truck	15.4	7.9	33.7	14.9	40.8	26.2	
	Buses	22.9	10.5	57.9	20.6	20.7	12.8	

SD: Standard deviation
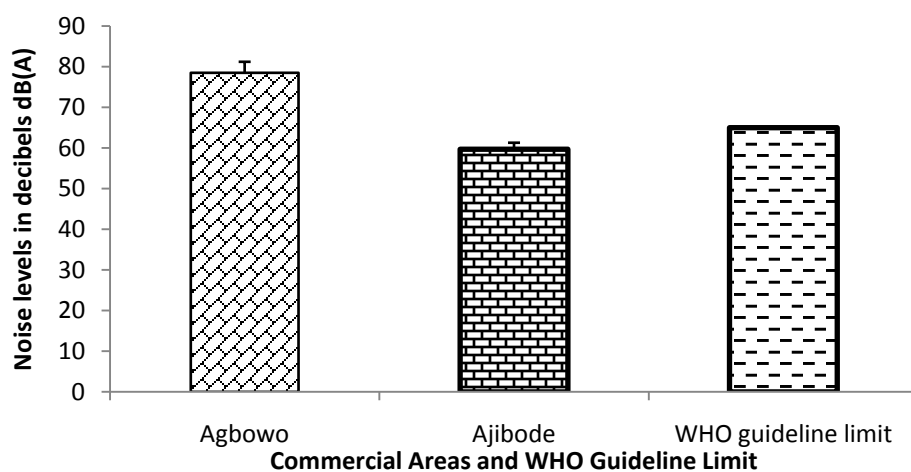
Figure 1.0 : Mean Noise levels in Agbowo and Ajibode compared with WHO guideline Limit.
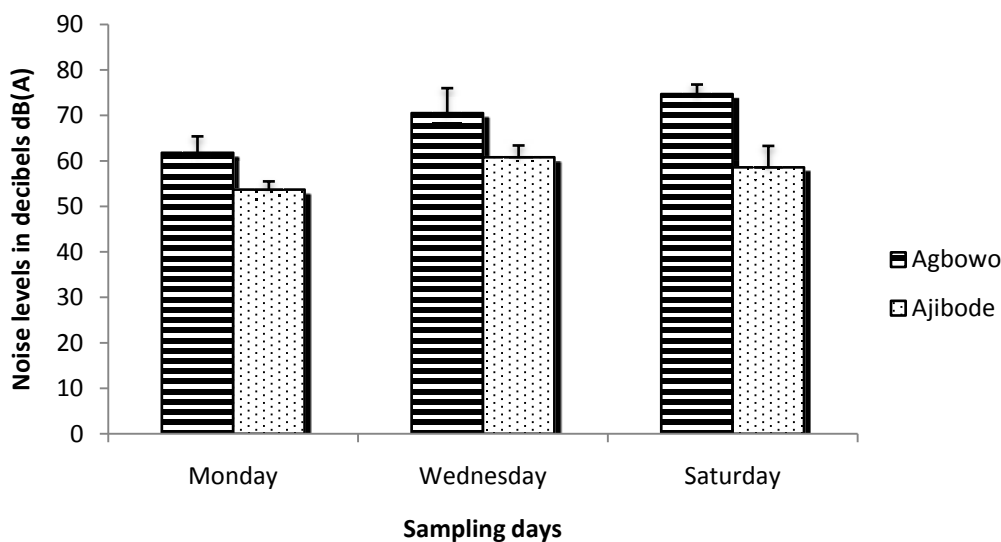
Figure 2.0 : Mean noise levels between 6am – 8am at Agbowo and Ajibode during a three day sampling period
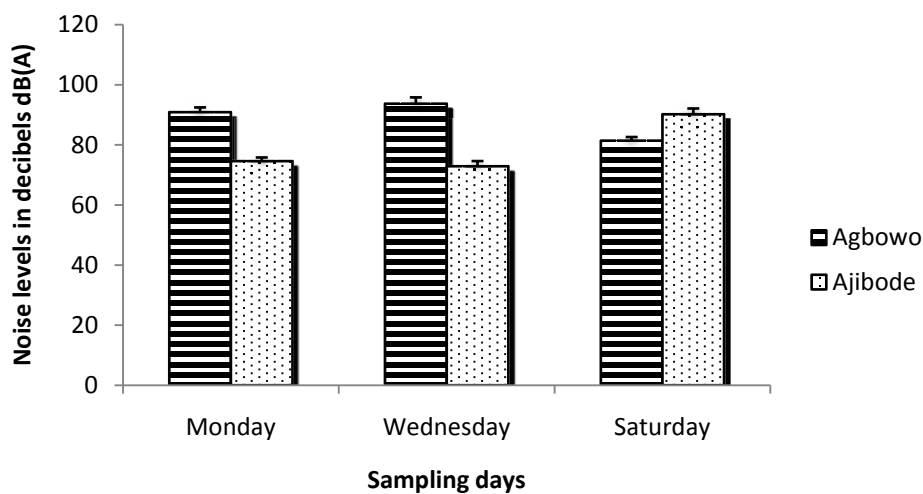
Figure 3.0 : Mean noise levels between 11am – 1pm at Agbowo and Ajibode during a three day sampling period
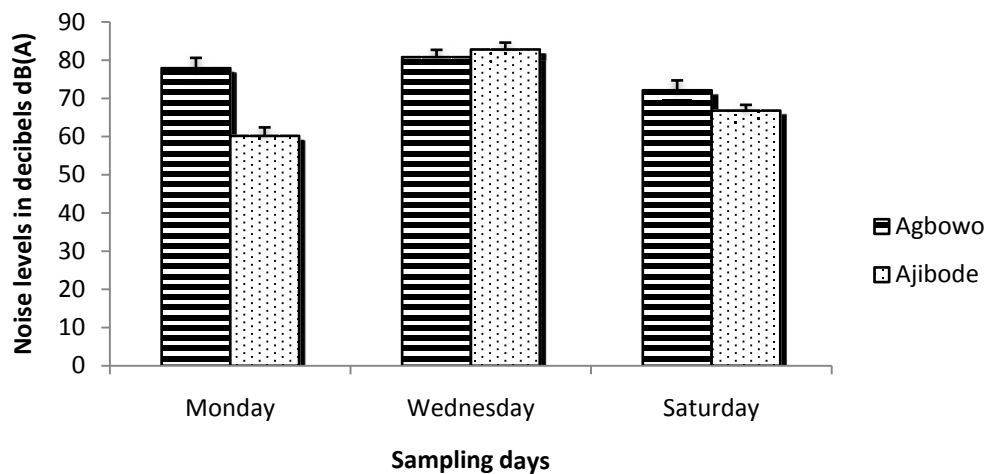
Figure 4.0 : Mean noise levels between 4pm – 6pm at Agbowo and Ajibode during a three day sampling period
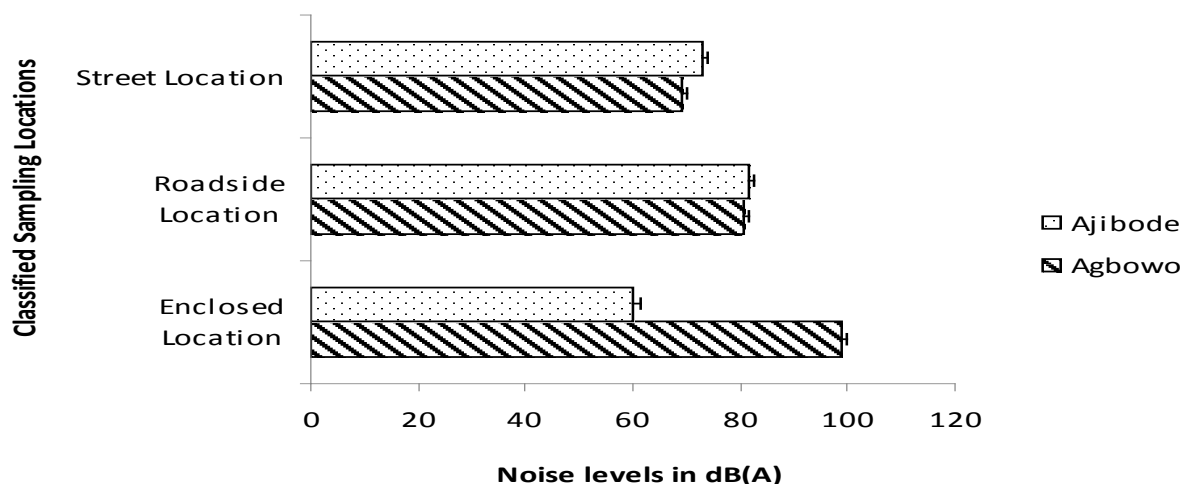
Figure 5.0 : Mean noise levels at the three sampling points in Agbowo and Ajibode

d) Noise levels at Workers Position

The workers at Agbowo were exposed to mean noise level of 81.0dBA which exceeded the WHO guideline limit of 70dBA. The maximum and minimum values ranged from 63.6 dB(A) to 99.2 dB(A). In Ajibode, workers were exposed to mean noise level of 62.5 dBA which was below the WHO guideline limit of 70dBA. The maximum and minimum values ranged from 60.0 dB(A) to 82.7 dB(A). The mean hour at work in Agbowo was 5.5±1.7 hours as compared to 2.1±1.1 hours in Ajibode. See Table 3.3

Table 3.0 : Mean Noise Level at Workers position Business Area   Noise level dB(A) p-value

Business Area	Noise level dB(A)				p-value
	Mean	Standard deviation	Minimum	Maximum	
Agbowo	81.0	8.74	63.6	99.2	$p < 0.05$
Ajibode	62.5	4.65	60.0	82.7	

e) Risk Map for Noise

The global Positioning system(GPS) facility was used to determine all the coordinates of the measurements points (MPs). The noise levels of MPs and the coordinates were used to develop a risk map showing high, medium and low risk areas based on noise levels obtained. See Plate 3.1, 3.2 and Table 3.4
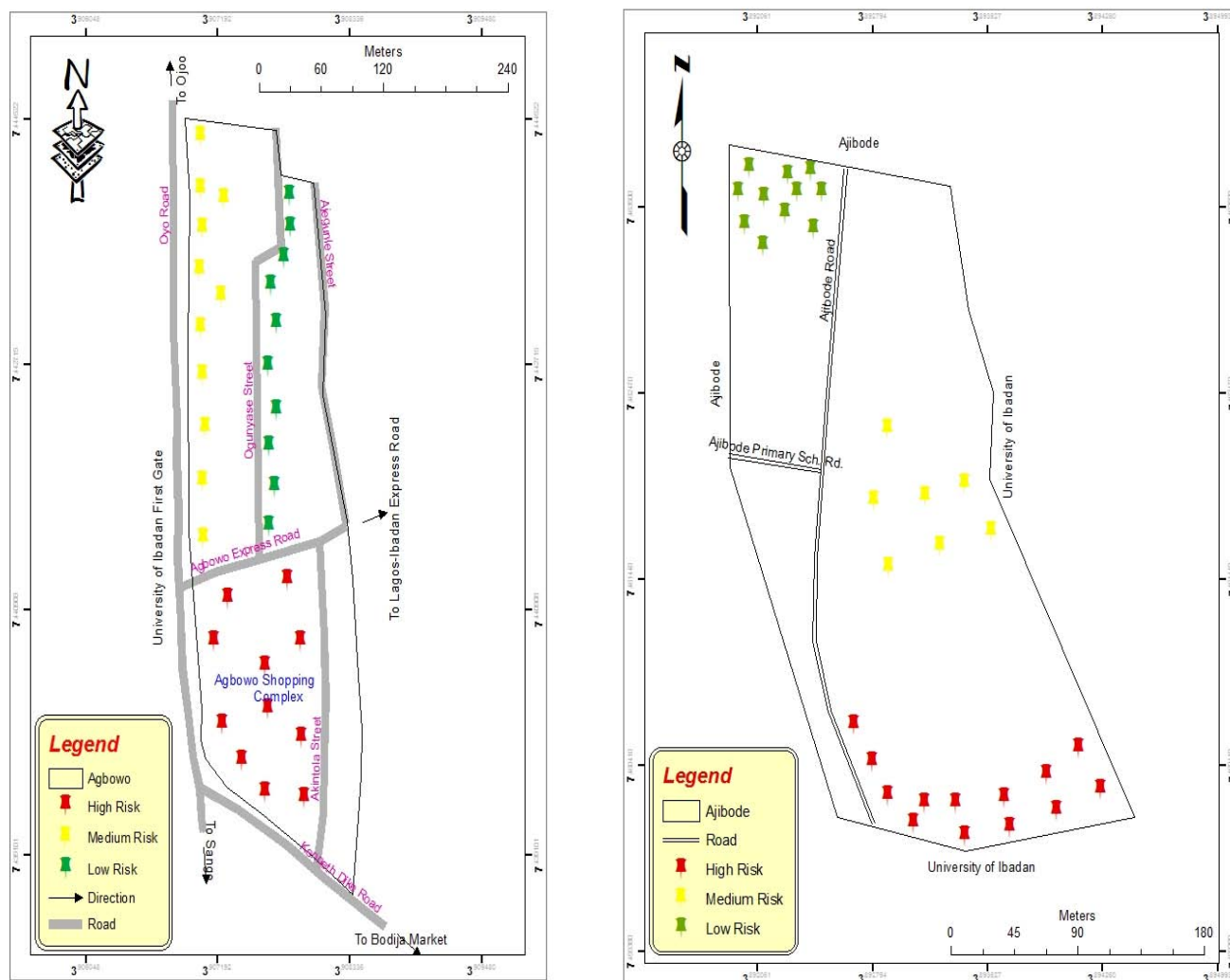
Plate 1 and 2: Risk Map for Generator Users in Agbowo & Ajibode Commercial Environmen

Table 4.0 : GPS spatial mapping data for Agbowo Commercial area

Business Area	Classified location	Sampling Points	Longitude (ºN)	Latitude (ºE)	Elevation (m)
Agbowo	AG1	EC1	7°26'27.00"N	3°54'26.35"E	783
		EC2	7°26'25.17"N	3°54'26.42"E	613
		EC3	7°26'23.81"N	3°54'26.92"E	692
		EC4	7°26'25.30"N	3°54'28.25"E	759
		EC5	7°26'27.38"N	3°54'28.34"E	680
	AG2	RSS1	7°26'29.27"N	3°54'25.36"E	675
		RSS2	7°26'30.78"N	3°54'25.33"E	613

	RSS3		7°26'31.93"N	3°54'25.59"E	690
	RSS4		7°26'33.85"N	3°54'25.37"E	680
	RSS5		7°26'35.26"N	3°54'25.46"E	696
AG3	SSS1		7°26'29.76"N	3°54'27.39"E	765
	SSS2		7°26'30.89"N	3°54'27.48"E	751
	SSS3		7°26'31.78"N	3°54'27.41"E	700
	SSS4		7°26'33.01"N	3°54'27.47"E	769
	SSS5		7°26'34.43"N	3°54'27.47"E	748

Table 5.0 : GPS spatial mapping data for Ajibode Commercial area

Business Area	Classified location	Sampling Points	Longitude (ºN)	Latitude (ºE)	Elevation (m)
Ajibode	AJ1	EC1	7°27'45.77"N	3°53'34.35"E	621
		EC2	7°27'45.48"N	3°53'34.85"E	617
		EC3	7°27'46.58"N	3°53'34.90"E	626
		EC4	7°27'47.07"N	3°53'34.80"E	667
		EC5	7°27'46.99"N	3°53'34.07"E	698
	AJ2	RSS1	7°27'37.25"N	3°53'33.32"E	768
		RSS2	7°27'37.31"N	3°53'33.74"E	677
		RSS3	7°27'37.80"N	3°53'33.52"E	657
		RSS4	7°27'36.49"N	3°53'34.20"E	665
		RSS5	7°27'36.50"N	3°53'34.23"E	661
	AJ3	SSS1	7°27'40.41"N	3°53'35.55"E	633
		SSS2	7°27'40.98"N	3°53'34.75"E	723
		SSS3	7°27'42.49"N	3°53'35.60"E	711
		SSS4	7°27'40.99"N	3°53'37.21"E	743
		SSS5	7°27'42.51"N	3°53'34.77"E	717

IV. Discussion

The high numbers of environmental noise sources such as electric generator, cars, music houses and motorcycles observed in Agbowo location as compared with Ajibode is predicated on the increased level of commercial activities present in this area. A similar study on environmental noise within Delta state campus, Nigeria conducted by (Oseji, 2011) revealed heavy noise pollution during business activities and attributed this to the indiscriminate use of electric generators. Another study conducted by (Omubo-Pepple, 2010) in Nigeria revealed that the main noise pollution sources in Port Harcourt metropolis came from generators, road traffic and the use of loudspeakers mainly in religious and social gatherings. Frequent power failure has resulted in proliferation of electric generators in Agbowo, hence urgent government intervention and health education is required to employ noise control strategies.

Traffic Density in Agbowo significantly exceeded those in Ajibode. The noise from vehicles may be termed road traffic noise. Suter, 1991 identified the principal noise sources in a vehicle as the power unit and its auxillaries, transmission system, tires and braking system. This may have contributed to the high level of noise observed in Agbowo as compared with Ajibode due to the increased presence of automobiles.

The highest noise level measured in both Agbowo and Ajibode was around 11am -1pm, which was above the WHO guideline limit of 70dB (A) for a commercial environment. This may not be unconnected with the fact that respondents have the highest level of patronage and majority of the generators are in operation around that time frame. In addition, Agbowo and Ajibode are close to traffic prone areas, which could contribute to the overall noise levels. Yusoff and Karim (1997) revealed high noise level (104.3 dB) emanating from vehicular traffic.

High noise level in enclosed location in Agbowo exceeded those recorded in Ajibode and other classified locations (Roadside and Street). Suter (1991) suggested that narrow streets and tall buildings can augment noise and produce a "canyon" in which traffic noise or any other type of noise reverberates. Therefore the the nature of the environment and surrounding buildings may be responsible for the overall noise levels measured in this location.

The risk map showed that noise levels were significantly different in all classified locations. High risk areas were represented by enclosed and road side locations in Agbowo and Ajibode respectively. The noise levels within this location is between 80-90 dBA, which is capable of inducing hearing impairment (WHO, 1993). This is not surprising considering the fact that traffic noise (Suter, 1991) and electric generators in operation (Makinde et al., 2008) produce heavy noise pollution which significantly contributes to the overall work environment noise levels. This calls for urgent government intervention in the area of health education of workers on the hazards of noise exposure. Low risk areas in Agbowo (street location) and Ajibode (enclosed location) were characterized by noise levels between 60-70 dBA. Individuals within such location are at low risk of developing hearing impairment, because its still within the guideline limit set by (WHO, 1993).

Workers in Agbowo were exposed to mean noise levels of 81.0 dBA which ranged from (63.5 dBA to 99.2 dBA) as compared with their counterparts in Ajibode 62.5 dBA which ranged from (60.0 dBA to 82.7 dBA). The workers in Agbowo generally work for 5.5 ± 1.7 hr/day as compared to 2.1 ± 1.1 hr/day in Ajibode. Therefore they are both exposed over 36 hr/wk to high noise levels. The noise exposure levels in Agbowo are excessively high as compared to the maximum permissible noise exposure limit of 85-90 dB(A) for 40h/wk as suggested by ISO, 1971. This high level of noise interferes with communication between workers, and prolonged exposure could lead to hearing impairment.

V. Conclusion

In this study, we described the level of noise pollution in selected/classified business locations. Environmental noise sources such as generators, automobiles (traffic) and music shops were observed to be higher in Agbowo as compared to Ajibode, this may have contributed to the overall noise levels observed in Agbowo as the mean noise levels in Agbowo were found to be significantly higher than the WHO guideline limit of 70 dB(A) for commercial work environment. High risk areas as described by the risk map were enclosed and roadside locations in Agbowo and Ajibode respectively. These areas were characterized by noise levels within 80-90 dB(A). The workforce in these locations are at high risk of developing noise induced hearing loss (NIHL) and other associated ailments due to excessive noise exposure.

Therefore there is an urgent need for the government to design and implement a well defined, comprehensive and enforceable noise regulation. In Nigeria, total working hours per week are around about 20% more than those in USA or European countries (Olayinka, 2009), therefore the limit of 90 dB(A) for 8 h/d

stated by OSHA and Nigerian factories Act (FEPA, 1991) has to be followed with caution. Furthermore, workers in these locations need to be provided with personal safety devices such as ear plugs or ear muffs. Position of worker at work is also important as surrounding surfaces need to be covered with sound absorbent material e.g glass. Enclosure of power generating sets would provide more attenuation than leaving it exposed.

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Biomechanical Structure of Skilled Female Gymnast's Technique In the «Handspring» Vault

By Vitaly Kashuba, Irene Khmelnitska & Svetlana Krupenya

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Abstract- The paper deals with the problem concerning the substantiation and development of special programs to improve sports technique of skilled female gymnasts in «Handspring» vault with an apparatus «vaulting table».

Keywords : technique of motor actions, female gymnast, "handspring" vault, vault table, biomechanical analysis.

GJMR-K Classification : NLMC Code: QT 255

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Strictly as per the compliance and regulations of:

Biomechanical Structure of Skilled Female Gymnast's Technique In the «Handspring» Vault

Vitaly Kashuba [α], Irene Khmelnitska [σ] & Svetlana Krupenya [ρ]

Abstracts- The paper deals with the problem concerning the substantiation and development of special programs to improve sports technique of skilled female gymnasts in «Handspring» vault with an apparatus «vaulting table».

Keywords: technique of motor actions, female gymnast, "handspring" vault, vault table, biomechanical analysis.

I. Introduction

The important task in improvement of vault performance in artistic gymnastics is to identify those informative biomechanical characteristics of gymnast's motor actions that influence to sport result. So we need to study the biomechanical structure of gymnast's vault technique. One of the areas of the technique improvement is to use the methodological approaches [1, 4]. At this stage of artistic gymnastics it was found that the optimal methods of teaching to complicated vaults must be justified biomechanically [2, 3, 7].

The objective of our research is to substantiate the improvement of female gymnast's vault performance on the table by using the biomechanical motion analysis.

II. Methods

We used the video based recording and 2D analysis technology by Sony Handicam DCR-VX2100E digital camera (25 frames per second) positioned in line with the table, perpendicular to the direction of the runway. We performed manual tracking motion analysis by using the «BioVideo» software that designed by kinesiology department, National University of Physical Education and Sports of Ukraine.

20 skilled female gymnasts – the members of Ukraine's National Team – have participated in the researches. Skilled female gymnasts performed «Handspring» vaults on «vault table» which were filmed using Sony Handicam DCR-VX2100E digital camera positioned in line with the table, perpendicular to the direction of the runway. Then we defined angles, distances and velocities by videogram processing with the «BioVideo» software.

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III. Results

The «Handspring» vault movement was divided into seven separate phases: I – approach; II – hurdle-step; III – on-board; IV – pre-flight; V – on-table; VI – post-flight; VII – landing. As a result of the biomechanical analysis of female skilled gymnast's motor actions, the following quantitative kinematic parameters: the velocity of general center of gravity (GCG) of gymnast's body in the run-up to the board; the duration of hurdle-step phase; the duration of on-board phase; the velocity of the GCG of gymnast's body at take-off the board; the angles in knee and hip joints at take-off the board; the duration the pre-flight phase; the duration of on-table phase; the velocity of the GCG of gymnast's body at take-off the table; the angle in shoulder joint at take-off the table; the duration, height and horizontal distance of the post-flight phase; the angle between horizontal and body at take-off the table; the turn angle at the ascending part of the post-flight trajectory; the angle in hip joint in piked/tucked salto forward off; the angle between the vertical and body at the landing; the angle in knee joint at the landing were determined. Canter of gravity was calculated using mathematical models developed by Hanavan model. The GCG trajectory of female gymnast's body has been also analysed. Thus, the duration of post-flight phase in "Handspring" vault is 0.863 s (SD = 0.019 s), the height of flight is 1.26 m (SD = 0.11 m), and the horizontal distance of flight is 2.19 m (SD = 0.24 m).

The leading elements of the "Handspring" vault motor structure on the table are the kinematic characteristics of female gymnast's motor actions in post-flight phase: its duration, height of flight trajectory and flight horizontal distance. This was confirmed by the results of further statistical evaluation with correlation analysis. The correlation coefficients between these characteristics and total score of the "Handspring" vault are from 0.59 to 0.72 at a significance level $p < 0.05$ (Fig. 1). We determined experimentally that the indicator of skilled female gymnast's body position was the angle in her hip joint in post-flight phase that equaled to 53,0 ° (SD=2,6 °) in the "Handspring" vault.

Basing on the results of biomechanical analysis, we have developed the training program for skilled female gymnasts in order to improve their «Handspring» vault performance [6]. This program includes: strategy, purposes, exercises complex, training tools and

methods, dosage, recreation intervals and seven exercise complexes (5 exercises per complex) for each vault phase (a total of 35 exercises), performance criteria and scales for biomechanical monitoring of female skilled gymnast's technique in the "Handspring" vault. One separate complex solves the problem in achieving of those biomechanical parameters which sport performance depended on directly. Our program is designed for trainers working with skilled female gymnasts and aiming to improve their performance of handspring vault. The efficiency of author's special program was confirmed through the direct comparative pedagogical experiment.

20 gymnasts were divided by random selection into two groups of 10 gymnasts both in control and experimental group. Gymnasts in both groups had no statistically significant differences by biomechanical characteristics of vault technique at the beginning of the pedagogical experiment (Table 1).

Table 1 : Kinematic parameters of «Handspring» vault performed by skilled female gymnasts of control (n=10) and experimental (n=10) groups on the «vault table» at the beginning of pedagogical experiment

Phase		Characteristic	Control group		Experimental group		Difference between groups
			mean	SD	mean	SD	
I	approach	velocity, m·s⁻¹	6.28	0.246	6.27	0.138	p>0.05
II	hurdle-step	time, s	0.278	0.006	0.276	0.008	p>0.05
III	on-board	time, s	0.106	0.019	0.108	0.017	p>0.05
		velocity at take-off the board, m·s⁻¹	4.75	0.15	4.74	0.15	p>0.05
		angle in knee joint, degrees	158.80	7.95	157.50	8.79	p>0.05
		angle in hip joint, degrees	147.4	12.08	150.3	8.5	p>0.05
IV	pre-flight	time, s	0.246	0.010	0.252	0.021	p>0.05
V	on-table	time, s	0.224	0.011	0.216	0.008	p>0.05
		velocity at take-off the table, m·s⁻¹	3.51	0.20	3.48	0.18	p>0.05
		angle between horizontal and body at take-off the table, degrees	60.4	6.8	60.0	5.9	p>0.05
		angle in shoulder joint, degrees	133.8	6.2	133.0	6.2	p>0.05
VI	post-flight	time, s	0.864	0.016	0.862	0.022	p>0.05
		turn, degrees	367.0	37.6	367.2	31.2	p>0.05
		height off the flight, m	1.26	0.10	1.27	0.12	p>0.05
		horizontal distance, m	2.19	0.26	2.20	0.24	p>0.05
	piked/tucked salto forward off	hip joint, degrees	53.4	3.0	52.7	2.3	p>0.05
VII	landing	angle between vertical and body, degrees	50.6	3.9	49.8	3.5	p>0.05
		angle in knee joint, degrees	78.9	7.3	78.5	7.2	p>0.05
	Vault total time, s		1.689	0.029	1.712	0.023	p>0,05
	A score		4.54	0.13	4.60	0.23	p>0.05
	B score		8.30	0.37	8.36	0.212	p>0.05
	Total score		12.84	0.41	12.96	0.32	p>0.05

Pedagogical experiment was carried out during 12 months at the training to main starts in the Ukrainian and World Championships. Gymnasts in both groups trained on a single plan per 3 hours twice a day, six days a week. The only difference between the groups was that the control group trained under the traditional program and the experimental group trained by our program.

We calculated quantitative "before-after" pedagogical experiment to analyze skilled female gymnast technique in Handspring vault. After the experiment, gymnasts of the experimental group increased on average A score from 4.60±0.23 to 4.84±0.22, p<0.05; B score from 8.36±0.21 to 8.90±0.16, p<0.05; gymnasts of the control group also increased A score from 4.54±0.13 to 4.60±0.19, p>0.05; B score from 8.30±0.37 to 8.64 ±0.25, p<0.05 (Table 2).

Table 2 : Kinematic parameters of «Handspring» vault performed by skilled female gymnasts of control (n=10) and experimental (n=10) groups on the «vault table» as a result of pedagogical experiment

Phase		Characteristic	Control group		Experimental group		Difference between groups
			mean	SD	mean	SD	
I	approach	velocity, m·s⁻¹	6.58	0.518	7.97	0.548	p<0.05
II	hurdle-step	time, s	0.274	0.010	0.272	0.010	p>0.05
III	on-board	time, s	0.106	0.013	0.092	0.014	p<0.05
		velocity at take-off the board, m·s⁻¹	5.42	0.384	6.32	0.432	p<0.05
		angle in knee joint, degrees	161.8	7.3	169.4	7.3	p<0.05
		angle in hip joint, degrees	154.0	7.1	164.8	6.2	p<0.05
IV	pre-flight	time, s	0.224	0.016	0.188	0.023	p>0.05
V	on-table	time, s	0.210	0.017	0.192	0.010	p<0.05
		velocity at take-off the table, m·s⁻¹	4.13	0.393	4.99	0.531	p<0.05
		angle between horizontal and body at take-off the table, degrees	61.0	5.7	66.7	5.7	p<0.05
		angle in shoulder joint, degrees	141.1	6.3	155.3	9.3	p<0.05
VI	post-flight	time, s	0.875	0.021	0.896	0.018	p<0.05
		turn, degrees	376.1	32.1	397.0	28.3	p<0.05
		height off the flight, m	1.50	0.111	1.77	0.157	p<0.05
		horizontal distance, m	2.43	0.209	2.80	0.132	p<0.05
	piked/tucked salto forward off	angle in hip joint, degrees	45.2	3.1	38.1	4.7	p<0.05
VII	landing	angle between vertical and body, degrees	48.7	4.1	45.0	3.2	p<0.05
		angle in knee joint, degrees	79.1	7.2	86.6	7.8	p<0.05
Vault total time, s			1.689	0.029	1.640	0.034	p<0.05
A score			4.60	0.189	4.84	0.227	p<0.05
B score			8.64	0.246	8.90	0.163	p<0.05
Total score			13.24	0.344	13.74	0.310	p<0.05

IV. Discussion

Knoll & Krug [5], using a laser speed measurement system for the competition analysis of the women vaults in world championship 2007 found that handspring-type vaults averaged 7.74 m/s on the vaulting table. Our investigation indicated that skilled female gymnasts showed the average velocity from 6.27 m/s (SD=0.14 m/s) at board contact in vault on "new table" in experimental group before the experiment to 7.97 m/s (SD=0.55 m/s) after the experiment.

V. Conclusion

1. The parameters of kinematic structure of skilled female gymnast's motor actions in the "Handspring" vault are the velocity of general center of gravity of gymnast's body in the run-up to the board; the duration of hurdle-step phase; the duration of on-board phase; the velocity of the GCG of gymnast's body and the angles in knee and hip joints at take-off the board; the duration the pre-flight phase; the duration of on-table phase; the velocity of the GCG of gymnast's body and the angle in shoulder joint at take-off the table; the duration, height and horizontal distance of the post-flight phase; the angle between horizontal and body at take-off the table; the turn angle at the ascending part of the post-flight trajectory; the angle in hip joint in piked/tucked salto forward off; the angle between the vertical and body at the landing; the angle in knee joint at the landing. The leading elements of sports technique in the "Handspring" vault are the kinematic characteristics of post-flight phase: the duration, the height and horizontal length of GCG's trajectory of female gymnast's body. The correlation coefficients between these parameters and total score in the "Handspring" vault are r = 0.59-0.72 (p <0.05).

2. The biomechanical characteristics of skilled female gymnast's motor actions and the laws of their changing in the «Handspring» vault allowed

developing a program for performance technique improving. The efficiency of author's special program was confirmed through the direct comparative pedagogical experiment.

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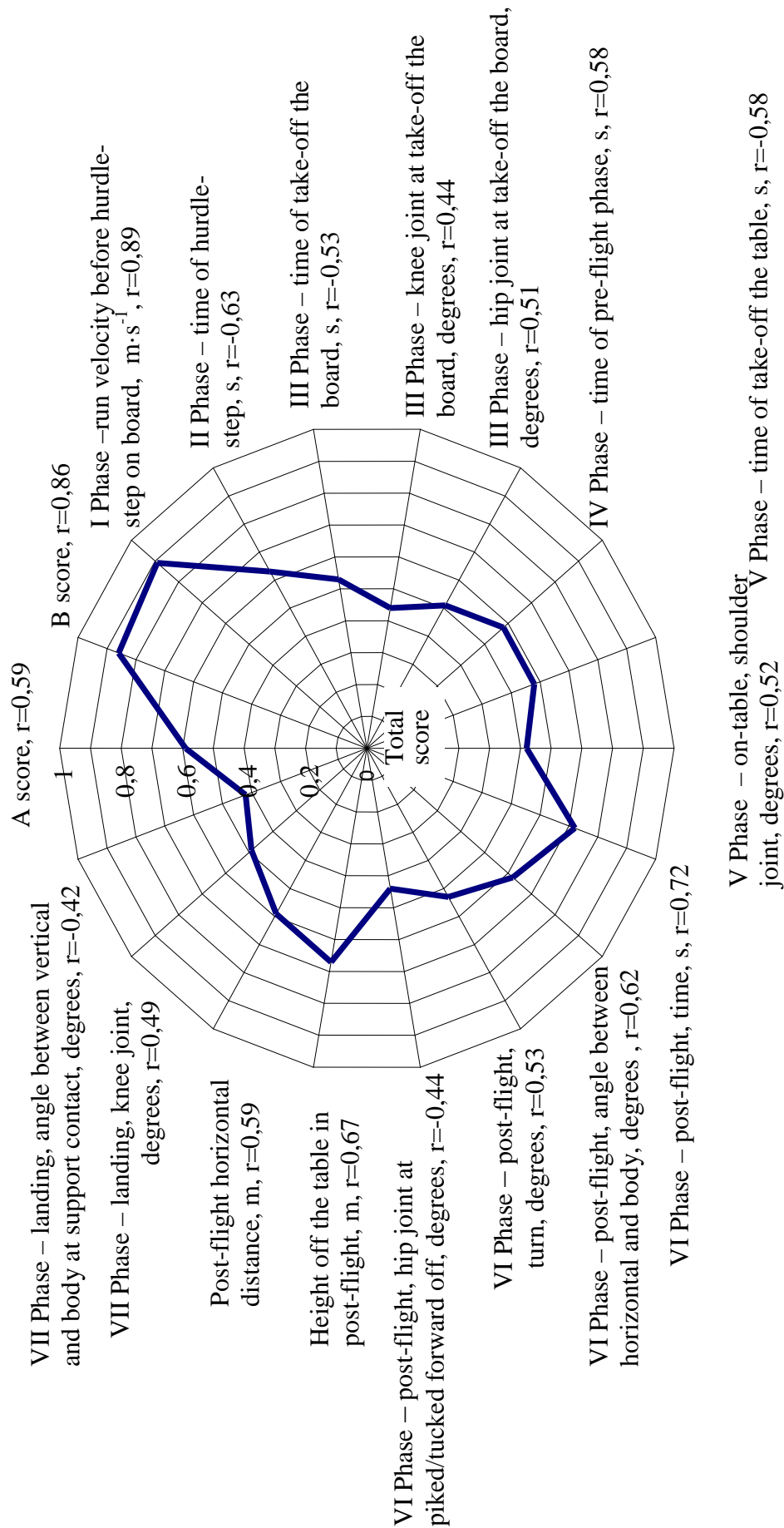
Figure 1: The correlation coefficients between kinematical characteristics of skilled female gymnast's technique and total score (n=20) in handspring vault, p<0.05

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- Paragraph before Spacing of 1 pt and After of 0 pt.
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1. General,

2. Ethical Guidelines,

3. Submission of Manuscripts,

4. Manuscript's Category,

5. Structure and Format of Manuscript,

6. After Acceptance.

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- 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 sound written Procedures segment allows a capable scientist to replacement 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 for the least amount of information that would permit another capable scientist to spare 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 object, mention the specific item describing a way but draw the basic principle while stating the situation. The purpose is to text 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:

- Explain materials individually only if the study is so complex that it saves liberty this way.
- Embrace particular materials, and any tools or provisions that are not frequently found in laboratories.
- Do not take in frequently found.
- If use of a definite type of tools.
- Materials may be reported in a part section or else they may be recognized along with your measures.

Methods:

- Report the method (not 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 - details how procedures were completed not how they were exclusively performed on a particular day.
- If well known procedures were used, account the procedure by name, possibly with reference, and that's all.

Approach:

- It is embarrassed or not possible to use vigorous voice when documenting methods with no using first person, which would focus the reviewer's interest on the researcher rather than the job. As a result when script up the methods most authors use third person passive voice.
- Use standard style in this and in 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.

Results:

The principle of a results segment is to present and demonstrate your conclusion. Create this part a 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. Carry on to be to the point, by means of statistics and tables, if suitable, to present consequences most efficiently.You must obviously differentiate material that would usually be incorporated in a study editorial from any unprocessed data or additional appendix matter that would not be available. In fact, such matter should not be submitted at all except requested by the instructor.

Content

- Sum up your conclusion in text and demonstrate them, if suitable, with figures and tables.
- In manuscript, explain each of your consequences, point the reader to remarks that are most appropriate.
- Present a background, such as by describing the question that was addressed by creation an exacting study.
- Explain results of control experiments and comprise 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 in manuscript form.

What to stay away from

- Do not discuss or infer your outcome, report surroundings information, or try to explain anything.
- Not at all, take in raw data or intermediate calculations in a research manuscript.

- Do not present the similar data more than once.
- Manuscript should complement any figures or tables, not duplicate the identical information.
- Never confuse figures with tables - there is a difference.

Approach

- As forever, use past tense when you submit to 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 part.

Figures and tables

- If you put figures and tables at the end of the details, make certain that they are visibly distinguished from any attach appendix materials, such as raw facts
- Despite of position, each figure must be numbered one after the other and complete with subtitle
- In spite of position, each table must be titled, numbered one after the other and complete with heading
- All figure and table must be adequately complete that it could situate on its own, divide from text

Discussion:

The Discussion is expected the trickiest segment to write and describe. A lot of papers submitted for journal are discarded based on problems with the Discussion. There is no head of state for how long a 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 implication of the study. The purpose here is to offer an understanding of your results and hold up for all of your conclusions, using facts from your research and generally accepted information, if suitable. The implication of result should be visibly 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 with prospect, and let it drop at that.

- Make a decision if each premise is supported, 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 the experiment might be personalized to accomplish a new idea.
- Give details all of your remarks as much as possible, focus on mechanisms.
- Make a decision if the tentative design sufficiently addressed the theory, and whether or not it was correctly restricted.
- Try to present substitute explanations if sensible alternatives be present.
- One 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 available information
- Submit to work done by specific persons (including you) in past tense.
- Submit to generally acknowledged facts and main beliefs in present tense.

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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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