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Babalola OO (2002). Interactions between *Striga hermonthica* (Del.) Benth. and fluorescent rhizosphere bacteria Of *Zea mays*, L. and *Sorghum bicolor* L. Moench for *Striga* suicidal germination In *Vigna unguiculata* . PhD dissertation, University of Ibadan, Ibadan, Nigeria.

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# **An Examination of the Effects of Two Equating Methods on the Equivalence of the First Grade DIBELS Oral Reading Fluency Probes**

<sup>\*1</sup>Chung-Hau Fan, <sup>2</sup>Peter R. Denner, <sup>3</sup>Yi Ding and <sup>4</sup>Yu-Lin Chang

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Research has revealed concerns regarding the limited psychometric evidence for using CBM oral reading fluency (CBM-R) for progress monitoring at the individual student level due to probe nonequivalence. Equating methods based on test theories have been shown to be useful to equate less comparable forms. This study investigated the effect of using mean equating and linear equating methods for managing score variability at the individual student level across DIBELS ORF (DORF) probes. A sample of 68 first grade students were administered the first grade DORF probes, and their words correctly read per min (WCPM) were calculated. The results indicated the comparability of the DORF outcomes was significantly improved with the two equating methods. Additionally, linear equating outperformed mean equating for managing score variability. Nevertheless, noticeable score variability was still observed at the individual student level. Directions for future study and implications for applying equating methods for making educational decisions are discussed.

**Keywords:** Oral reading fluency, equating, curriculum-based measurement, progress monitoring

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## INTRODUCTION

Curriculum-based measurement (CBM) is an approach to measuring the academic growth of individual students frequently to help teachers in evaluating the effectiveness of their instruction (Deno, 1985). Historically, CBM data have been used to guide low-stakes decisions (e.g., responsiveness to classroom instruction, pre-referral intervention effectiveness; Shinn, 1998). The reauthorization of the Individuals with Disabilities Education Improvement Act (IDEIA, 2004) allows school districts the option of using response-to-intervention (RTI) methodology to identify specific learning disabilities (Fuchs & Fuchs, 2006). The use of CBM data has been incorporated into such methodology, where students are considered for special education eligibility if they continue to show a lack of adequate progress after exposure to evidence-based interventions (Fuchs & Fuchs, 2006). As a result, CBM or CBM-like measures (e.g., *Dynamic Indicators of Basic Early Literacy Skills*; DIBELS; Good & Kaminski, 2002) are used for eligibility decision-making purposes (Speece, Case, & Molloy, 2003). Although different RTI models have been practiced widely in American school systems, several unsolved issues remain (Kratochwill, Clements, & Kalymon, 2007). One major concern is the lack of psychometric equivalence of CBM reading (CBM-R) measures (i.e., the incomparability of those parallel probes). To date, the evidence to support the comparability of CBM-R probes has been lacking (Betts, Pickard, & Heistad, 2009; *Cummings, Park, & Bauer Schaper, 2013*; Stoolmiller, Biancarosa, & Fien, 2013). From a progress-monitoring perspective within RTI models, such score variability across parallel probes may cause difficulties when

deciding whether to alter or modify a given student's intervention, and it affects the accuracy of high-stakes eligibility decisions. As a result, the rate of false positives and false negatives could be high (Ardoin, Christ, Morena, Cormier, & Klingbeil, 2013; Petscher, Cummings, Biancarosa, & Fien, 2013). After reviewing 171 journal articles, chapters, and instructional manuals, Ardoin et al. (2013) concluded that there is limited psychometric or empirical support for using CBM-R for progress monitoring purposes at the individual student level due to form nonequivalence. They further commented, "It is necessary to first develop CBM-R passage sets composed of equivalent level passages, procedures that allow for equating of passages to accommodate for variation in passage difficulty, or some combination of these procedures" (p. 14).

## EQUATING METHODS

Initially, CBM reading passage sets were developed by randomly selecting passages from students' curricula. This method is flawed because of the considerable variability in the difficulty of texts within curricula (Hintze & Christ, 2004). Recognizing the negative effect of inconsistencies, developers of CBM passage sets (e.g., AIMSweb; DIBELS; Good & Kaminski, 2002; Howe & Shinn, 2002) used readability formulas to control passage difficulty. However, after years of study, researchers have concluded that readability formulas are poor predictors of students' oral reading fluency performance (Ardoin, Suldo, Witt, Aldrich, & McDonald, 2005; Poncy, Skinner, & Axtell, 2005).

Very recently, researchers have begun to apply equating techniques in their studies to enhance the comparability of CBM-R scores (Betts et al., 2009; **Cummings** et al., 2013; Stoolmiller et al., 2013). Equating is the process of adjusting for difficulty differences between test forms built to measure the same content to establish comparability of scores across forms (Kolen & Brennan, 2004). Equivalent scaling is necessary to validate the claim that the unit of measurement across passages is similar, and therefore provides evidence that scores across passages are on the same unit of measurement (**Albano & Rodriguez, 2012**). For instance, two passages (A and B) may be of equal difficulty with a mean of 100 WCPM but have different standard deviations (e.g., 10 words for passage A and 20 words for passage B). If two students each read 120 WCPM in passages A and B, the scores would not strictly be comparable. One student would have scored two standard deviations above the mean on passage A, while the other student would have scored only one standard deviation above the mean on passage B. Thus, an investigation of equivalence should involve an evaluation of both difficulty and scaling across passages.

Mean equating is used to adjust the [distribution](#) of scores so that the mean of one form is comparable to the mean of the other form without changing the original score scale. This is the most basic method of horizontal equating, but it is only appropriate if the standard deviations across alternate forms are similar (Christ & Hintze, 2007). The mean level of performance across multiple passages (i.e., easy and difficult) would be placed at a selected mid-point to equate performances across forms. For instance, the CBM-R mean might be scaled to 30 WCPM for all first grade CBM-R probes. If

passage A had a mean of 40 WCPM, then 10 points would be taken away from each student's score because it is a relatively easy probe. However, the mean equating method might be too simplistic because it does not take into account any differences in standard deviations across the forms (Albano & Rodriguez, 2012). Nevertheless, one advantage is the scores after mean equating transformation are still authentic scores, which keep the same scale as the raw scores. This can make the use and communication of the assessment outcomes easier for the audience than defining the level of a student's performance as in relative norm-referenced scores.

Linear equating can be conceptualized as an establishment of equivalent standard scores (z-scores) for two or more different parallel forms. Moreover, linear equating can be used when the standard deviations across alternate forms are substantially different. Nevertheless, there is an important assumption that the score-distribution shapes of the different forms should be the same, or at least approximately the same (Kolen & Brennan, 2004). Linear equating adjusts scores for differences across forms in both the mean and the standard deviation, such that the rescaled scores for different forms will have the same mean and standard deviation (*SD*). However, linear equating does not eliminate nonlinear relations across forms. Also, the transformed scores after linear equating are no longer authentic scores (Christ & Hintze, 2007). Albano and Rodriguez (2012) utilized data collected in Francis et al. (2008) to demonstrate the effects of mean and linear equating transformation with the second grade DIBELS ORF probes. Given the small sample size ( $N < 70$ ) with a partial random-groups design, the results still suggested that linear equating transformation was more preferable

than no equating for managing score variability.

Equipercntile equating is the most general and powerful method because it can accommodate any degree of linearity or nonlinearity across forms. Through the conversion of raw scores (i.e., WCPM) to equipercntile ranks, students' scores on nonequivalent forms can be compared (Kolen & Brennan, 2004). Among the three equating methods, equipercntile equating requires a relatively larger sample size to make sure percntile ranks for each point can be estimated, or it may result in a poor approximation of the equating relation due to too many unobserved points on the scale (Albano & Rodriguez, 2012). Because the required sample size and the complexity of the procedures for the mean, linear, and equipercntile equating methods increase successively, it may just be unwise to apply equipercntile equating in all conditions if simpler procedures can perform adequately (Stoolmiller et al., 2013). Since equipercntile equating was not the focus in the current study, interested readers can consult Kolen and Brennan (2004) for more details.

To examine this cost-efficiency issue and identify the most parsimonious equating method, Cummings et al. (2013) examined the three equating methods' accuracy and efficiency using DIBELS Next DORF probes from Grades 1 to 6. The mixed-model ANOVAs with repeated measures were conducted to examine the effects of the equating methods on the overall means across each grade's DORF probes. In addition, the standard error of equating (SEE; standard deviation of equated scores) information was used to index the potential effect on score variability caused by random sampling error (Kolen & Brennan, 2004). With their second grade sample for demonstration, Cummings et al. (2013) found relatively lower SEE values (compared with the mean equating

method) produced by the linear equating method in the score range between 30 and 80. Further, the efficiency of the equating methods for the DORF probes was examined with the likelihood ratio test for comparing model fits based on chi-square statistics. More detailed information regarding the testing procedure and the analyses can be found in Cummings et al. (2013). In summary, the results of their efficiency examination indicated linear equating produced the best outcomes with their sample, except for Grade 1, where mean equating was the most efficient method for 13 out of the 20 progress-monitoring probes. However, because equating procedures remove the mean differences across probes, it should have been no surprise their results showed there was no significant difference across the probe means following the equating transformation. In other words, no significant score variability was identified after the equating transformation because the equating procedures had eliminated the form nonequivalence at the group level. Although this was an important finding of their study, score variability at the individual level was left unexamined. Given the fact that the use of CBM-R progress-monitoring procedures in making high-stakes decisions is performed mainly at the individual student level, it is also very important to consider what happens to score variability at the individual level under the different equating methods. As Shapiro (2013) commented, "Certainly, the lack of evidence of the reliability and validity of decisions made from these types of individual progress-monitoring data is a potentially devastating finding to practitioners" (p. 61). In other words, the evidence for the validity of CBM-R based on group study findings should not be over generalized to its application to monitor and evaluate individual student progress

(Ardoin et al., 2013). Thus, more evidence of validation is needed for the use of CBM-R progress-monitoring procedures to inform high-stakes decision making at the individual student level. Taken together, although the current research findings suggest estimates of students' reading rate (i.e., word correctly read per minute; WCRPM) would benefit from establishing equivalent scaling to facilitate comparison of non-equivalent passages, no studies have examined the effects of the equating procedures at the individual student level.

## PURPOSE OF THE STUDY

As stated in the literature, the equating methods and the trade-offs (e.g., cost-efficiency) associated with them have just begun to be investigated (Petscher et al., 2013). Since both the mean and linear equating methods were found to be more efficient at the primary grades than equipercentile equating (Cummings et al., 2013), the current study was intended to further examine and compare these two equating methods to determine their assistance with managing the equivalence of the first grade CBM-R probes. Moreover, we proposed a different analysis method from Cummings et al. (2013). We examined how much the variance in individual scores (i.e., score deviation from each individual's mean) might be reduced through statistical equating. This approach can directly validate the use of CBM-R probes to monitor progress at the individual student level, which was never examined in any previous study with a similar design of using repeated measures.

Two research questions were addressed in this study:

*Research Question #1: Does the mean or linear equating method perform better than no equating transformation for managing within-participant variances across the probes?*

*Research Question #2: Does one equating method perform better than the other?*

If evidence were to support the use of these less complex equating methods for making CBM-R progress-monitoring scores more comparable at the first grade level, it might serve to encourage educators and researchers to use them with greater assurance. Moreover, when CBM-R probes are more comparable after equating transformation, fewer probes may be needed to generate precise and accurate educational decisions as the magnitude of measurement errors are under better control (Hintze & Christ, 2004).

## METHOD

### Participants and Contexts

This study was conducted in two elementary schools located in a Midwestern state. Parental consent and student oral assent were obtained for 68 first grade students (36 females and 32 males). Thirty-one of the participants were from a rural school, in which the first grade students were 100% Caucasian. About 10% of the entire school population in the first building was eligible for discounted/free school meals. About half of their first graders (52%) participated in this study. The other 37 participants were from a small city school with an ethnically diverse student population. About 24% of the

first grade students participated in the study. The first graders in that school year were composed of Caucasian (47%), African American (29%), Hispanic (19%), and Asian/Pacific Islander (5%). About 68% of the students in the second building received free or reduced lunch.

In the first school setting, the test administrators used the same two testing rooms to administer the assessments to students individually. In the other school, the test administrators used the library and the school counselor's office. Each session lasted approximately 10 min.

### **Procedures and Measures**

DIBELS ORF (DORF) Sixth Edition is a standardized, curriculum-based measure for indexing a reader's overall reading competence (Good & Kaminski, 2002). Reliability evidence was reported by its developers in terms of alternate-forms reliability ( $r = .89$  to  $.94$ ). The 20 progress-monitoring probes were arranged in four packets of five probes for each day of data collection. To avoid fatigue and practice effects, the 20 DORF probes were divided into four sets of five probes and were intended to be administered in a counterbalanced order in 4 days. However, a perfect counterbalanced design (i.e., having 17 participants for each probe set on each testing day) was not obtained during administration. Table 1 shows the exact numbers of participants administered each probe set on each data collection day. Five probes in each set were randomly administered to each participant to avoid order effects. For example, on Day 1 each of the 19 participants might receive a different order with the probe Set 1 such as 3, 1, 4, 5, 2, or 4, 1, 2, 3, 5. On Day 2, each of the other 15 participants might receive a different

randomly assigned order such as 5, 4, 1, 2, 3, or 2, 4, 1, 3, 5. Therefore, the administration orders varied for each participant.

During assessment, the test administrator placed the probe in front of the student and read scripted instructions to students prior to reading the probes informing them that they would be reading aloud, explaining where to start reading, and encouraging them to do their best. Each participant read the 20 progress-monitoring DORF probes during a 1-week interval at the end of the school year. According to Kolen and Brennan (2004), the use of such repeated measures across all forms with a single group of subjects can better control random errors than using a random-groups design. In addition, each participant was informed that he or she would be allowed to choose a sticker from the examiner as a reward at the end of each day's assessment. The participants were also told that they would receive an ice-cream gift card when they finished all the probes at the end of the study. Using incentives could ensure that any changes in student performance on probes within and across days were a function of changes in the difficulty of the probes and not changes in student motivation. At the end of each data-collection day, the researcher according to the standardized directions completed the scoring for scoring in the technical manual of DIBELS (Good & Kaminski, 2002).

### **Inter-Administrator Agreement**

There were four test administrators and all were trained in DORF administration procedures. One administrator was a senior school psychologist who had 15 years' experience working for the local educational agency

**Table 1.** Numbers of Participants in the Four Groups of Probe Sets on Each Testing Day

	DAY 1	DAY 2	DAY 3	DAY 4
Set 1 (Probe 1~5)	19	15	17	17
Set 2 (Probe 6~10)	20	18	14	16
Set 3 (Probe 11~15)	17	19	19	13
Set 4 (Probe 16~20)	12	16	18	22
Total Participants	68	68	68	68

(LEA). She received DORF training provided by the LEA in which she was employed. The other three test administrators were doctorate school psychology program students from the author's institution. Directions for administration were reviewed by the researcher to them, including the standardized directions verbatim, the coding system (i.e., a slash for an incorrect response, a bracket after the last word provided at the end of 1 min), and other rules (e.g., discontinue rule, hesitating or struggling with words). After review of the standardized administration procedures, a randomly selected first grade DORF benchmark probe was used for practice with each administrator. During the training sessions, the researcher pretended to be a beginning reader and made common mistakes (e.g., omission, commission, repetition, jumping through lines) to familiarize the administrators with the recoding procedures. Each training session was about a half hour and on an individual basis with the administrators.

Inter-administrator agreement was examined to ascertain the degree of scoring accuracy. The researcher and one of the four test administrators served as the primary test providers and the other three administrators served as independent recorders. While the primary administrator was administering the DORF probes, an

independent recorder was recording the data in a separate examiner booklet using the DORF coding system. Inter-rater agreement was assessed for about 20% of the assessment data on a word-by-word basis by comparing each word the test administrators recorded as correct or incorrect to each word the independent recorder scored as correct or incorrect. The number of agreements (correct and incorrect) between the administrator and the independent recorder was divided by the total number of words and multiplied by 100 to obtain a percentage (House, House, & Campbell, 1981). The results indicated that the judgments made by the test administrators on each probe had high inter-rater agreement with an average agreement of 98%.

### Equating Transformation

Words correctly read per minute (WCPM) was calculated using the criteria in the DIBELS manual (Good & Kaminski, 2002). Then, we applied mean equating and linear equating to equate passages to the scale of the first probe (*the Ant Hill*), which showed the smallest value of standard deviation (*SD*) with the current sample. Because linear equating modifies each probe's variance to match the reference probe, it was important to select

the passage with the smallest variance in its score distribution as the reference. In this way the rescaled variance was kept to a minimum. Also, **Albano and Rodriguez (2012) suggested the reference passage should be about average difficulty to ensure the overlap between score distributions across passages.** The average score of *the Ant Hill* probe with the current sample was about 3 WCPM above the overall mean of the 20 DORF probes, which addressed this suggestion.

### Data Analyses

In a repeated measure ANOVA, the total variation,  $SS_{Total}$  can be partitioned into  $SS_{Between.Persons}$  and  $SS_{Within.Persons}$ . In an experimental design,  $SS_{Between.Persons}$  is a function of differences between the means of the persons who receive treatments and  $SS_{Within.Persons}$  is a function of the pooled variation within the individual persons across the treatments. Different to Cummings et al. (2013), who examined the overall treatment effects resulting from the equating transformation (i.e.,  $SS_{Between.Persons}$ ), we examined how much score variability could be reduced (or under control) in each participant by the selected equating methods (i.e.,  $SS_{Within.Persons}$ ). In other words, less score variability might be observed in a participant's graph of scores. In everyday practice, educators are usually more interested in the within-participant variation that could interfere with the accuracy of decision making (e.g., concluding that changes in progress-monitoring scores reflect a student's response to instruction). The within-participant variation can be partitioned into the effect of treatment variation (in this case the probes) and residual variation. In this study, the residual variation could be due to participant-probe interaction, temporary

performance fluctuation, and other uncontrolled residual sources other than the effects caused by the equating procedures. To determine the within-participant variance, we calculated the variation within each participant. The formula was  $SS_{w.person\ i} = \sum(Y_{ik} - M_{pi})^2$ . This is the sum of the squared deviations of the scores for person  $i$  away from the mean for person  $i$ . As mentioned earlier, this reflects score variability associated with the progress-monitoring probes and residual errors. The degrees of freedom ( $df$ ) for the within-participant variation is  $k - 1$ . Dividing each obtained within-participant variation by its degrees of freedom, yielded the within-participant variances for the 68 participants in the study. Thus, instead of examining overall treatment differences in the equated scores at the group level as was done in Cummings et al. (2013), we used a repeated measures ANOVA to determine whether there was a significant difference among the within-participant variances under the three conditions: no equating, mean equating, and linear equating.

As a follow up to the overall repeated measures ANOVA, we conducted planned multiple comparisons using the Bonferroni procedure to determine if there were significant differences between the means of within-participant variances under the three equating condition. The level of significance was set at  $\alpha = .05$  for the repeated measures ANOVA and the level of significance set at a family-wise error rate of .05 for the multiple comparisons.

Besides ANOVA, the SEE allowed further analysis of the accuracy of the two equating methods (Kolen & Brennan, 2004). The SEE applied to each DORF probe was calculated through the bootstrap method over 500 replications of the two equating methods for comparisons.

Similar to Cummings et al. (2013), the obtained SEE results in the current study should be interpreted with reservation due to the relatively small sample.

Further, in order to demonstrate the difference in score transformation between the three equating conditions, the data of the lowest performing reader with our sample was used for this purpose. The reason for choosing this dysfluent reader is that DORF progress-monitoring probes are usually used for tracking progress of those students who score below benchmarks. The benchmark of DIBELS DORF score for the end of the first grade is 40 WCPM (Good & Kaminski, 2002). The selected student, who read an average of approximately 22 WCPM in this study, fell much below the benchmark and is suitable for the purpose of this demonstration. This student's raw and rescaled scores were graphed to allow visual analyses of the magnitude of the DORF scores fluctuating across probes at the individual student level and the effects of the two equating methods on passage equivalence.

## RESULTS

### Performance before Equating

The current study applied a single-group equating design to control random errors in CBM-R data collection. The results of descriptive statistics indicated that the average raw scores (WCPM) across probes encompassed a range from a low of 69 WCPM on probe #16 to 88 WCPM on probe #18. The range of variability indexed by the standard deviation (*SD*) was from 31.5 to 40.3. The score distributions of the 20 DORF probes were close to a normal distribution. The alternate form correlations between the 20 probes were quite high, .89 to .97, which

were consistent with previous findings (e.g., Betts et al., 2009; Stoolmiller et al., 2013).

### Effects of Equating Methods

Table 2 shows the means and standards of the within-participant variances under the three probe equating conditions. Preliminary analysis indicated the repeated measures ANOVA assumption of sphericity was not met, so the results were reported for the lower-bound conservative test. The effect of the equating methods on the within-participant variances was statistically significant,  $F(1, 67) = 130.23, p < .001$ . Following the advice and formulas provided by Tabachnick and Fidell (2007, p. 290) for estimating measures of effect size when the sphericity assumption is violated, partial  $\eta^2$  was computed to be .66 and the lower-bound value for  $\eta^2$  was computed to be .29. The finding indicated a significant difference among the within-participant variances under the three treatment conditions that explained between 29% to 66% of the within-subject variances. Multiple comparisons using a Bonferroni procedure with separate error terms revealed the within-participant variances were significantly lower ( $p < .01$ ) under the linear equating method ( $M = 65.35$ ) than the mean equating method ( $M = 90.64, d = -0.30$ ) or the no equating condition ( $M = 129.53, d = -0.77$ ). In addition, the within-participant variances were significantly lower ( $p < .01$ ) after the mean equating transformation than the no equating correction ( $d = -0.47$ ). Due to violation of the sphericity assumption, we based our calculations of the Cohen's  $d$  effect sizes on the standard deviation of the no equating control condition as recommended by Cohen (1988), which reduced the effect size estimates in this

**Table 2.** *Descriptive Statistics for the Within-Participant Variances under the Three Equating Conditions*

	<i>M</i>	<i>SD</i>	95% CI for <i>M</i>
No Equating	129.53	83.00	[109.44, 149.62]
Mean Equating	90.64	65.31	[74.84, 106.45]
Linear Equating	65.35	47.36	[53.89, 76.81]

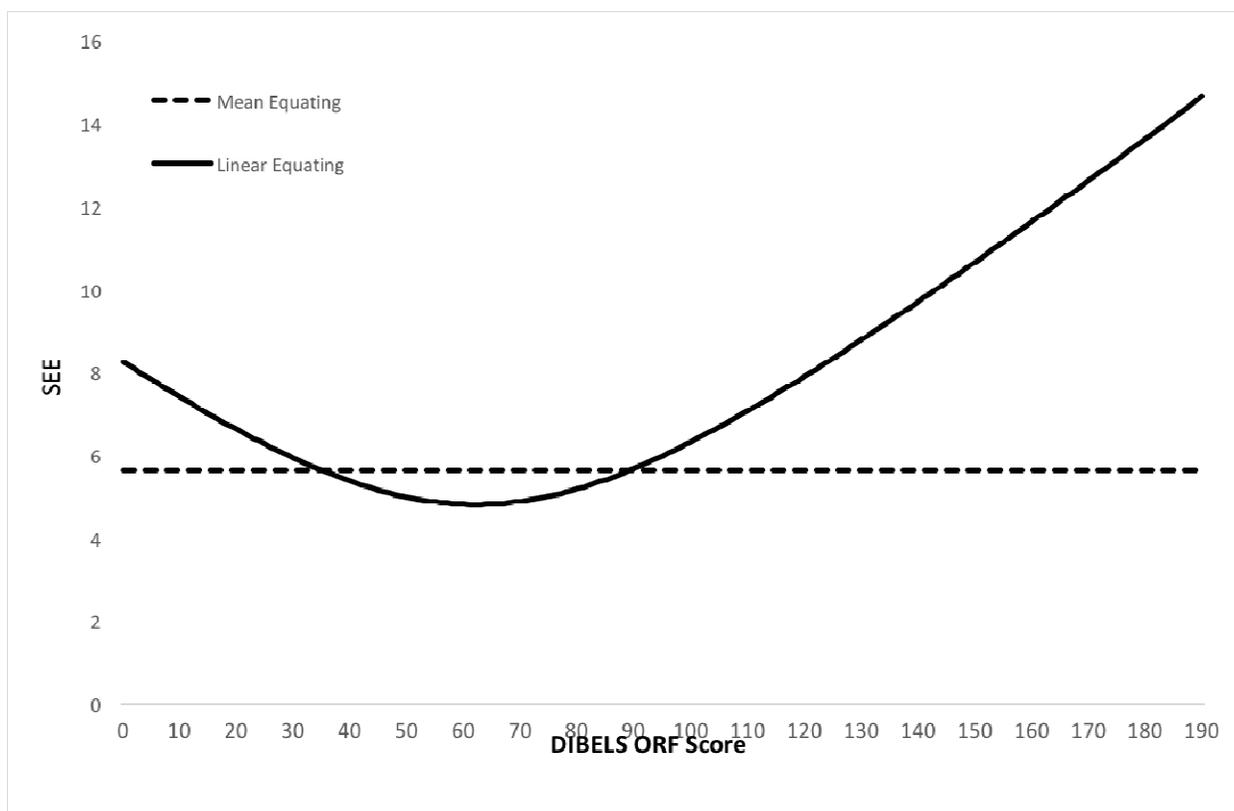
case. Importantly, the results indicated the mean equating method and the linear equating method both reduced the within-participant variances across the probes when compared to the no equating condition. Using the no equating method as the base, the results indicated an average reduction of 49.5% in the within-subject variances following linear equating and a 30% reduction in the within-subject variances following the mean equating method. Thus, the use of the equating methods made a substantial difference to the amount of fluctuation in individual performances across the probes. The effects of the equating methods on progress-monitoring decision making at the individual level were further demonstrated in the following section via visual analyses of raw and rescaled scores.

As to the SEE analysis of the two equating methods, the result of using the progress-monitoring Probe 2 as an example is presented in Figure 1 for demonstration. The estimated SEE of the mean equating method was about 5.64 and was consistent across all score levels in the distribution. The estimated SEE values associated with the linear equating method varied at each score point and were relatively lower when there were more frequent data points presented. Specifically, the estimated SEE values with the linear equating were lower than those with the mean equating transformation through the scores ranging from 35 to 89 WCPM. In other words, without frequently observed cases at the two ends of the score distribution,

the estimated effect of the linear equating might not be as strong as the mean equating method due to sampling error. These findings regarding the SEE patterns with the two equating transformation were similar to what was found in Cummings et al. (2013) with their second grade sample. Also, these SEE results were consistent across the other DORF probes (i.e., Probe 3 to 20) in the current study.

### **Visual Demonstration**

To demonstrate probe effects and potential benefits of the two equating procedures at the individual student level, Figure 2 and Figure 3 were used to show the raw and rescaled scores of the first grade DORF with the mean and linear equating methods for the lowest performing participant, Clifford. First, a significant magnitude of passage effects across the 20 probes was observed in Clifford's raw scores (up to a difference of 25 WCPM). With visual analyses, the score variability was substantially reduced with both equating methods. In general, the linear equating functioned better in reducing score variability. Specifically, the mean equating resulted in a maximum difference (i.e., highest score - lowest score)



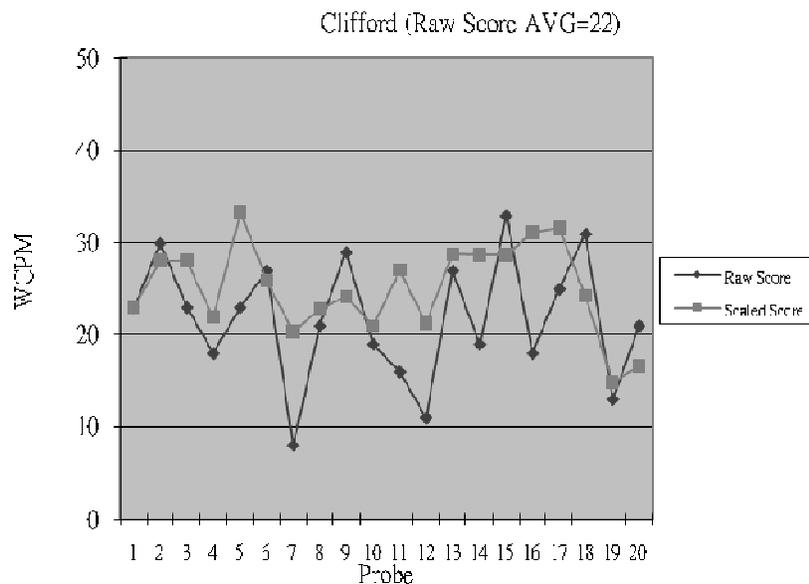
**Figure 1.** The standard errors of the mean and linear equating methods (SEEs) of the first grade DORF progress-monitoring Probe 2.

of 18 WCPM between the 20 progress-monitoring probes. In contrast, the linear equating showed a maximum difference of only 14 WCPM. Thus, the visual inspection confirms the ANOVA results regarding the effects of the equating methods on within-participant variance and demonstrates that the linear equating method had the most desirable outcome for managing score variability when examining individual performances for progress-monitoring decisions.

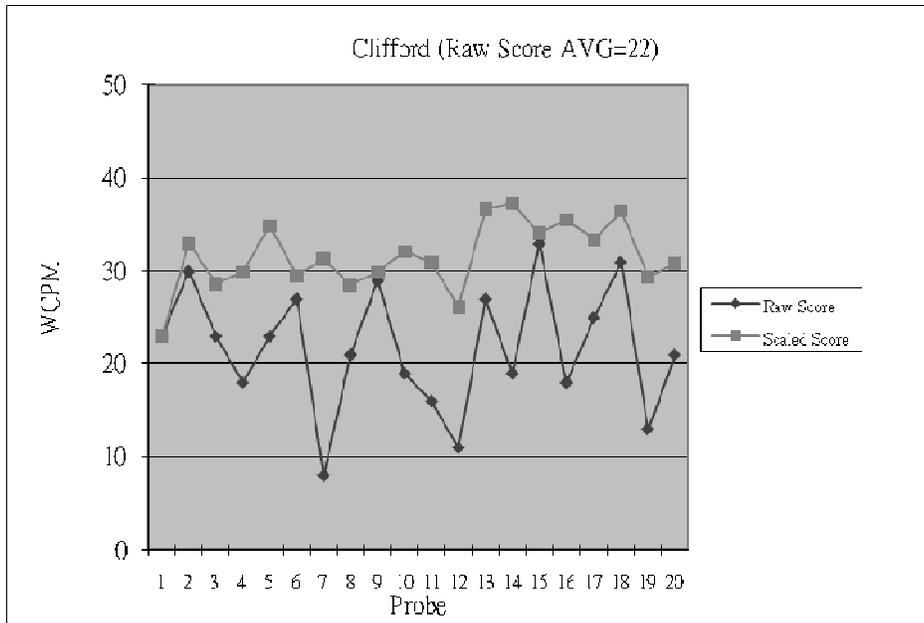
## DISCUSSION

IDEIA (2004) allows using RTI data as a part of the procedure of identifying specific learning disabilities. In

practice, however, no special education eligibility decisions are made for a group of referred students but only for individuals. Thus, it is important to study the use of test scores for this specific purpose (Ardoin et al., 2013; Messick, 1989). To our knowledge, the current study is the first examining the effects of CBM-R score variability within participants. The linear equating method in this study resulted in a significantly smaller within-participant variance than the mean equating method or no equating transformation. This result was consistent with the findings in previous studies that any equating methods outperformed no equating in terms of reducing score



**Figure 2.** The comparison between the raw and rescaled scores with mean equating on the first grade DORF measures with Clifford.



**Figure 3.** The comparison between the raw and rescaled scores with linear equating on the first grade DORF measures with Clifford.

variability across probes (Albano & Rodriguez, 2012; Cummings et al., 2013). However, different from what Cummings et al. (2013) had found, our finding indicated that the linear equating method rather than mean equating was more favored with our first grade sample. One possible explanation is that their data were collected in the middle of the first grade while ours were collected at the end. Therefore, our participants' scores might result in an approximate normal distribution with less impact by floor effects.

Different from the comparisons of overall equating effects using ANOVA, the analyses of the estimated SEE values painted a slightly different picture with the present sample. The linear equating method was more favored for score transformation only for those scores falling between 35 and 89 WCPM because beyond that score range, the low coverage of the data points may create more error than it can remove. Since DORF progress-monitoring probes are usually used with those low-performing students who are at the lower end of the distribution, this finding reemphasized the importance of equating methods selection as raised in the previous studies with relatively small sample sizes applied (e.g., Cummings et al., 2013; Francis et al., 2008). In sum, assuming the SEE is well controlled with an appropriate sample size (i.e., having enough data points at each score level), our finding suggests the linear equating method will be a better option to produce more interchangeable CBM-R scores when progress monitoring first grade readers. This significant reduction of score variability could help school teachers and school psychologists make more accurate decisions about their students' progress.

### Probe Nonequivalence

The key to success of an RTI model is the availability of measures suited for frequent progress monitoring to track student performance over time. Specifically, the reading passages need to function as parallel forms so educators can conclude that changes in the scores on the measures actually reflect changes in student performance, not measurement errors (Hintze & Christ, 2004). Although the developers of the DIBELS ORF measures made significant efforts to control for passage differences by using multiple readability formulas, significant differences in raw scores across the DORF probes were identified in the current study. This has also been shown in prior research (Betts et al., 2009; Cumming et al., 2013; Stoolmiller et al., 2013). As concluded in Cumming et al. (2013), "With this level of passage variability, school teams will struggle with identifying the extent to which student gains or losses in reading performance are due to true changes in reading skill, behavioral problems (e.g., lack of student

motivation), or passage difficulty" (p. 103). In the present study, the score variability within each participant could not be fully eliminated by the equating procedures. Even after the most desirable equating transformation (i.e., linear equating), the maximum difference was as high as 14 WCPM. Yet, the literature suggests for children in general education, realistic growth expectation for first graders is only 2 WCPM per week (Deno, Fuchs, Marston, & Shin, 2001; Fuchs, Fuchs, Hamlett, Walz, & Germann, 1993). Thus, the score variability is significantly larger than the expected weekly growth, which makes it difficult to develop reliable and valid decision rule for evaluating individual students' response to intervention. According to the modern concept of validity which places a heavy emphasis on how a test is used (Messick, 1989), this observed score variability across parallel forms would serve as a psychometric threat to the use of CBM-R results for making educational decisions at the individual student level.

In fact, equating procedures, regardless of the type, can only take care of score variability as reflected in an overall effect (e.g., *Cumming et al., 2013*). Each rescaled probe shared the same mean after the mean equating transformation or the same mean and standard deviation after the linear equating transformation. However, the individual score variability across probes remained. Although recent equating studies (*Cumming et al., 2013*; *Stoolmiller et al., 2013*) have found a positive impact to the application of equating methods on reducing CBM-R score variability, such results of comparability based on group designs should not be automatically transferred to making individual decisions without caution. This finding extended our understanding of the probe effects at the individual student level. To address this unsolved issue regarding the nonequivalence in CBM-R probes, other statistical methods such as generalizability (G) theory may be used with the equating techniques as a combination to improve the validity of individual decision making (Fan & Hansmann, 2015; Petscher et al, 2013). Future study may also consider examining the effect of a combination of different statistical procedures as to managing score variability with CBM-R.

### Practical Implications

To ensure the accuracy of using equating transformation, test developers (e.g., AIMSweb; DIBELS NEXT; Good & Kaminski, 2011; Howe & Shinn, 2002) may consider the significance of this finding when developing the next versions of CBM-R assessments to improve the precision of progress-monitoring decisions. In operation, it seems more reasonable for those enterprises to recruit a large sample of students across all grade levels to develop psychometrically sound parameters for cross validation before the dissemination of their CBM-R products. For example, the test developers ought to develop and

include score conversion tables in their technical manuals for potential users to transform raw scores into equated scores to help make more accurate decisions. As suggested by Stoolmiller et al. (2013), such instrument development activities (e.g., examining the effects of different equating methods to other non-analytic sample) should be conducted by test developers with advanced knowledge of measurement and statistical equating methodologies.

As to practicability, Nitko (1996) named the practicality features one of the eight facets to validity evidence of test use. A test (or statistical method) may not result in adequate outcomes if its operation is not perceived as cost-efficient by its users. In short, they may not even consider using it. Thus, not only theoretical but also practical factors for each specific use of equating procedures need to be thoroughly considered such as the required sample size, training and efforts for operation, and acceptability/understandability of the transformed scores by its potential audience (*Albano & Rodriguez, 2012; Stoolmiller et al., 2013*). Therefore, debates between using absolute or relative norm-referenced scores to describe a student's authentic performance remain (Cummings et al., 2013). In this study, the result of the pairwise comparisons suggested that the linear equating method outperformed the mean equating condition and the mean equating method outperformed no equating transformation at the first grade level. A simple implication is that having either mean or linear equating transformation is better than no equating correction. However, when choosing between mean or linear equating methods to manage nonequivalence in CBM-R scores, linear equating may not always be favored even with its superior outcome in the current study because the absolute scores (WCPM) generated by the mean equating method would be more understandable and acceptable by the general population to describe a student's authentic performance than using a relative score (after linear equating transformation).

### Limitations and Future Research Directions

The results of the present study are specific to the sample and the measures described. Several limitations must be acknowledged. First, the current study included only 68 first grade students. A larger sample of students is usually preferred for using an equating procedure (Kolen & Brennan, 2004). Future studies should include larger sample sizes to reduce sampling error and consider examining the benchmark probes so each progress-monitoring score can be directly equated back to the benchmark result. However, the primary purpose of the present study was to compare the effects of variance reduction at the individual level under the three equating conditions rather than establishing parameters based on

the current first grade sample to allow future application with another sample. Thus, due to the different purposes of data use, not having ideal sample sizes for cross validation would be unlikely to affect the importance of the present study. This study showed equating methods made a difference to first grade DORF score variability at the individual student level, which has not yet been studied and addressed in the current literature. Our results merit the attention of both researchers and educators regarding the validation of the use of CBM-R with statistical equating at the individual student level. Second, results are limited by examining only one grade level, as well as the selection of participants from two Midwest elementary schools. The current results should not be automatically generalized to other subpopulations or other CBM-R measures without further replications of the findings. Third, a distributive model of treatment acceptability (Carter, 2008) may guide future research to investigate the practicability features of different equating methods. This model comprises three facets: consumer acceptability, consultant acceptability, and societal acceptability. School psychologists are typically consultants who have training and experience to implement and monitor the use of equating procedures in educational settings. However, teachers' and other professionals' psychometric knowledge and previous experience should also be taken into account. Without adequate buy-in from consumers, the practicability evidence for the proposed equating methods might be weak (Nitko, 1996). In other words, the gap between scientific findings and the real world practice remains. It is recommended that formal or informal methods used to assess acceptability may include rating scales or interview.

### CONCLUSION

Since CBM procedures play an increasingly important role in making high-stakes educational decisions, it is important to understand their limitations when using their outcomes for different assessment purposes. The current study examined the effects of mean and linear equating methods for managing score variability within individual first graders. The results indicated that the form effects can be effectively controlled by the two equating methods and the comparability of the DORF scores was significantly improved. However, the score variability was still not negligible at the individual student level. Future research should further investigate the effects of those equating methods for tracking individual progress-monitoring data to directly address the validity issue (i.e., how a test is really used) by considering the purposes and interpretation of using DORF outcomes at RTI tiers (Ardoin et al., 2013). This is the primary implication of the present study.

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*Full Length Research*

## The Importance and the Strategies of Islamic Education According to Averroes and Mulla Sadrā

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The Islamic Education is one of the most important issues in Islamic philosophy which always has been considered by Muslim Scholars. Averroes, as a Peripatetic philosopher- following to Aristotle believed that self- education is one of the most important factors in the attainment of knowledge and focused on the role of theoretical and practical training for obtaining goods and goodness. Mulla Sadrā, Philosopher of Transcendent theosophy, also described the role of training and purification of the Carnal Soul in the understanding of intellectual questions and philosophical important facts undeniable. He believed that the training strategies such as following religion, being moral and understanding of intellectual questions and soul perishing are necessary to actualize material intellect. Also, Averroes considered to religion in the practical training. In result, these two Muslim philosophers believed that Islamic Education is the same of real happiness of human.

**Keywords:** Islamic Education, The Importance of Education, Training's Strategies and Barriers, Averroes, Mulla Sadrā.

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### INTRODUCTION

One of the most important issues which has considered by World's Scholars in the history of World is the problem of Training. The Islamic Trainings nature and strategies is also a problem which has considered by Muslim philosophers. Averroes and Mulla Sadrā -two Islamic philosophers by two different viewpoints; Peripatetic School and Transcendent Theosophy- considered the concept of Islamic Training in their different works. Our main issue in this research is exploring of the importance and strategies of Islamic Training by the two Philosophers points of view- Averroes and Mulla Sadrā. Our questions of in this article are: How do these

philosophers (Averroes and Mulla Sadrā) interpret the concept of training and its importance? What Strategies they propose for Islamic training?

Training is making receive to the ultra level. One of the important positions which training occurs is human carnal soul. Scholars have presented different viewpoints about the nature of the carnal soul. Averroes and Mulla Sadrā viewpoints about the nature of the carnal soul have some similarities; however we shouldn't ignore the differences of their viewpoints.

Averroes following Aristotle has presented the problem of the carnal soul in the realm of natural science and has

believed that the carnal soul is a power which is the base of life and growing and development. He also has believed that the carnal soul isn't abstract and depart from substance's conditions and its positions, but he has believed that it is the same. He has pointed in the definition of the carnal soul for the development in being primary for the natural organic body. (Averroes, 1994, p. 2). Mulla Sadrā also believed that the carnal soul is material entity in the createdness and generation, which emerged by due to the substance but after the development and appearance in during of the levels of integrity remains abstract entity (Mulla Sadrā, 1981: 65-66). So, both of philosophers primly have believed that the carnal soul is material but they have confessed that the carnal soul is apt to development and training. They also acknowledged that the carnal soul would be immortal and eternal after the development. Mulla Sadrā's focus on this concept is great.

Averroes and Mulla Sadrā divided the carnal soul into two practical and theoretical parts and believed that practical intellect is based on the human's fairs and it is knowledge of Morality while the theoretical part is related to theories and intellectual questions of the carnal soul. (Mulla Sadrā, 2001: book 2 p. 116 & Averroes 1924: p.241). Training also is one of the parts of the practical ingredient of the carnal soul in the works of these two philosophers.

We can consider the carnal soul's training in three aspects: The importance of the carnal soul's training, the carnal soul's strategies and the carnal soul's barriers.

The present article considers the comparative approach of the carnal soul from the aspect of the importance and strategies and barriers by the Averroes and Mulla Sadrā's viewpoints.

## **DISCUSSION**

### **The Importance of the Carnal Soul Training**

The importance of the carnal soul training can be investigated from the different aspects. We pay attention to the main aspects.

### **The Importance of the Carnal Soul in the obtaining of Happiness**

In spite of above mentioned cases which are believed by two philosophers, we can extract approaches and especial reasons from their works in the case of the carnal soul training that we briefly address these cases:

### **Especial Approach of Averroes about the Importance of the Carnal Soul Training**

Averroes focused from different approaches on the carnal

Averroes assures that achieving to the happiness is based on the Religious Law and Islam teachings. From the works of Averroes we can understand that he has believed that achieving to the happing is unrealizable without training. He has proposed the strategies for it. (Averroes, 1977: p. 14). Mulla Sadrā also believed that the happiness is the type of being which has different levels. He has acknowledged that while human souls develop and interesting of them in body waste and they come back to the Godhead, they will achieve to increasing happiness and enjoyment which aren't analogical with enjoyments of this world. (Mulla Sadrā 1981: book 4, pp. 122- 144). So, it is cleared that Mulla Sadrā has believed that approaching of human to happiness depends to abandonment of material connections of substance and destruction of soul obscurity. So, training in the viewpoint of Averroes and Mulla Sadrā is one of accessories of achieving to happiness.

### **The Importance of the Carnal Soul Training in Achieving to Knowledge**

In the viewpoint of Averroes, moral training and struggling with inclination of the soul, although in direct way can not create knowledge but it is one of the conditions of obtaining of knowledge. In other words, Averroes believed that moral training is necessary condition to achieving to cognition. But it isn't solely a sufficient condition for knowledge achievement. (Ghasem, 1964: pp. 23-24). Mulla Sadrā, also like as Averroes considered this problem sufficiently and in his many works acknowledged to the distinguishing role of being trained and preparing of the carnal soul in the creating of cognition and knowledge. He has believed that understanding of cognitions without training and preparing of the carnal soul is impossible. (Mulla Sadrā 1984, p. 145). Mulla Sadrā even believed that teaching of The Holy Koran is depended to being cleaned from crimes and faults by human. He also believed that it depends to cleanliness of the carnal soul from the abominations of Polytheism and burnishing of the carnal soul and destruction of all vices. (Ibid: 58-60). So, studying these two philosophers' thoughts, the importance of the carnal souls training clears in the obtaining of knowledge. soul training such as: being intended in Islamic religion and dividing of humans based on being trained.

### **Being Intended in Islamic Religion**

Averroes has believed that training is end of Islamic religion and has written that: "It's admirable that we know that Islamic religion's end is training of right doings. He focused on right doing and fairs and right science is the

same of Almighty's science and other beings like as real being. Right Science is the same of doing fairs which achieve to happiness and avoid from fairs which achieve to unhappiness and informing to these fairs is called practical science" (Averroes, 1977: p. 31). So, it is cleared that he has believed that the aim of Islam religion is learning science and right practice. It is an indication of the importance of training in Averroes thoughts.

### **Dividing of Humans based on Being Trained and non-being Trained.**

The Importance of the carnal soul training in Averroes ideas clears from his dividing which has presented in the case of humans. He has divided human beings from the aspect of being trained and non-being trained into two parts: virtuous humans and malicious humans. He also mentioned results which are related to these humans those are results of being trained and non-being trained. (Averroes, 1964: 241-2).

### **Mulla Sadrā's Especial Approach to the Importance of the Carnal Soul Training**

Mulla Sadrā also has addressed this problem from the different aspects which indicate his viewpoints about the carnal soul training:

#### **The Aim of Philosophy is the Carnal Soul Training**

The importance of the carnal soul training in Mulla Sadrā's ideas is to the extent that he believed that the aim of philosophy is the carnal soul training. It even rejected the famous definition of philosophy-knowledge about entities features in the extent of human ability- and has defined philosophy as the carnal soul development which will be possible by cognition of entities facts. In fact, this definition is based on philosophy profits and results. In his opinion, philosophy is a fact which its result is human development in the direction of practice and science. (Mulla Sadrā, 1987, 1, book: 1, pp. 20-21).

### **The Role of Mulla Sadrā's Substantial Motion in the Carnal Soul Training**

Mulla Sadrā's substantial motion also proves the importance of the carnal soul training in his thoughts, because that it based on substantial motion, the system of the world (Nature) is moving wholly and this moving is strongly. (Mulla Sadrā, 1987 /1/ book 2, p: 275). The training is also internal motion of entities towards the development. He believed that the substantial motion is reason and basis of developmental motions of entities

and humans souls. So, if human in the shadow of substantial motion and his developmental motion pass gradually from the natural and isthmus level, and when the level of wisdom level creates, he will receive to intuition from the whole of development in the best way by internal observations. (Dynāni, 2000: p.37).

### **The Role of the Carnal Soul Training in Achieving to the Spiritual Status**

Mulla Sadrā also addressed the importance of the training in achieving to friends of God and perfect human and has admitted that without training achieving to this status is impossible. Because that he called people like holy people who are aware of angels and their inspirations and also Satan and their temptations. He believed that the awareness is result of the carnal soul training. (Mulla Sadrā- 1984: p.193- 94).

### **The Carnal Soul Training's Strategies**

Averroes and Mulla Sadrā are from scholars who in spite of proving of the importance of the carnal soul have presented strategies for its training. They have addressed training from two aspects i.e. practical training and theoretical training (or Intellectual training). Here, we consider both of them separately.

#### **Practical training of the carnal soul**

Practical training is a kind of training that includes practiced fairs in the carnal soul training. It is the opposite of theoretical or intellectual. Here, we consider investigation of the carnal soul training approaches by the viewpoint of Averroes and Mulla Sadrā.

### **Averroes and Mulla Sadrā's Approach in Practical Training**

Studying Averroes works, we can understand that this Peripatetic philosopher has written little pages about the carnal soul training's strategies. His main preoccupation was theoretical intellect and he considered it extensively. Because that he believed that ethical virtue fairs and what are related to practical life of human in the management of society and home are from the religion's features and it should be accepted it without thinking and any objection (Averroes, 1964, p.241). So, he related training to the religion and due to its accessibility and clearness to the humans, he admitted that it isn't necessary to consider this in his philosophical writings. However, he considered it implicitly. Mulla Sadrā,

contrary to Averroes, has considered the carnal soul training and strategies fully and presented it in his works explicitly. The base of strategies which Mulla Sadrā presented for training of the carnal soul is that he like as ethics scholars has believed that the human carnal soul has different faculties such as intellectual faculty, power of anger and concupiscible faculty etc. He also talked about excess and neglect of these faculties. Here, we briefly address them.

a) **Intellectual Faculty:** it is a faculty which scholars of philosophy, sometimes relate the wisdom and wisdom understandings to it. This faculty denotes on the knowledge and cognition. Mulla Sadrā from the moderation of this faculty elected sapience feature which a mediocre of braveness and Ignorance. Braveness and Ignorance both are excess and neglect of sapience and so, we can call them bad fairs in morality (Mulla Sadrā 1984: book 3, p. 514). The aim of Mulla Sadrā in the training of intellectual faculty is achieving of it to the equability i.e. obtaining of sapience.

b) **Power of Anger:** Mulla Sadrā believed that anger is the boiling of blood in the heart which make to combust natural fire and metabolism of body material and its dampness. It does the same doing that the fire does with firewood. (Ibid, 1992: 2, p. 202). He has believed that this faculty has different boundaries that the braveness is result of moderation of it. He believed that the aim of ethical training is accessing to equability. So, other features like as generosity, braveness, patience, stability, self- control, equanimity, etc, divide from this feature. The bad feature of that is being fearless. In result, features like as arrogance, vanity etc divide from that. The being features also divides from the immoderation of this feature. That features like as disparagement, humbleness, susceptibility, powerlessness, ardor, not having sense of honor, smallness of the Carnal soul divides from these features. (Mulla Sadrā, 1984: book 4/ p.116).

c) **Concupiscible Faculty:** we can define passion as a strong willingness and interesting and eagerness which defines in the framework of the carnal soul movement. In moderation of this faculty it can be divided Chastity feature which is one of the carnal soul qualities. Chastity feature is the base of generosity, prudence, patience, negligence, contentment, piety; poverty of avarice, assistance etc. The immoderation of this feature is debauchery which is the base of greediness, impudence, extravagance, disingenuousness abusiveness, jealousy, and scolding, to be pretended to miserable in the time of richness. The immoderation of this feature is quietness. Both of them are from the bad doings in morality, and in the carnal soul training, humans struggle with them. (Ibid, 1984/1/pp.53, 412, /Ibid, 1984/4/p.116).

### **The Strategies and Training Levels in Averroes and Mulla Sadrā's Opinions.**

Although Averroes didn't recount any notes about the carnal soul training directly, but he presented strategies among his works. As we mentioned before, he believed that the moral perfections and on the whole what is related to the carnal soul training are from religions features and duties. So, Averroes considered that the religion and being obedient to religion are from the carnal soul training. In addition, he believed that practical intellect is foreground for theoretical intellect. He even postulated that practical intellect is necessary for theoretical intellect (Averroes, 1964: p.241). So, it clears that he presented practical intellect is before the presentation of an intellect which is related to intellectual training. He also postulated that without practical intellect, the appearance of theoretical intellect is impossible. Mulla Sadrā also, mentioned 4 levels about the training: first level is refinement of visage. The foreground for visage refinement is following to religion. Second level is the refinement of inner part means that cleaning of heart from the bad ideas and fairs. Third level is enlightening of heart by practical visages and real cognition based on faith and forth level is distraction of the carnal soul and does not pay attention to another thing but Allah [God] and devotion of attention to him. This level is the final level in journey to Allah [God]. There are many levels after that. (Mulla Sadrā; 1984/3/book 1/p.368). Respecting to these two philosophers opinions it clears that both of them believed that first strategy is following to religion and being obligated to religion and its teachings. But Mulla Sadrā explicitly went to upper level beyond the religion and admitted that there are other levels. Averroes against of Mulla Sadrā didn't mention these levels. However, as we mentioned already he introduced that practical wisdom before theoretical wisdom in the categorizing of philosophy. Practical wisdom includes ethics and esoteric doings which are exactly corresponding to second level of Mulla Sadrā division. Averroes after practical wisdom presented theoretical wisdom. This level also is corresponding to Mulla Sadrā third level. However, Mulla Sadrā presented another level which is only for him and Averroes hasn't pointed to this level. This level is destruction of the carnal soul. The reason that Averroes hasn't mentioned to this level is that Averroes is a Peripatetic philosopher. Mulla Sadrā in other works believed that rescue of human from the darkness is due to access to power of science and practice. He mentioned about this: "Already, it's impossible we can rescue and go to high level but by light of science and practice. The end of practice is purifications of inner and heart and the meaning of science is enlightenment and development and imagine of forms of facts." (Ibid, 1984: p.69). Mulla Sadrā addressed the effect of human abstract thoughts in the

case of the carnal soul training. He said that: "Undoubtedly every action has an effect on the carnal soul and an effect on abroad the human carnal soul against everyone action is special existence which has effect on the carnal soul. This is the whole of virtues and bad actions of the carnal soul. As the external actions has effect on the carnal soul spiritual actions has an effect on the carnal soul and result to effects from good and bad actions such as resentment, arrogance, self-absorption which theirs realizations appear in the world. (Ibid, 1984: p.195 /Ibid 1984/ 343). He said that every bad action which human do in this world such as injustice, tyranny, darkens human's spirits and engages them in this world fairs and declines spirits to the lowest level means the bestial soul. They deprive from the understanding of real enjoyment. The duty of human is to release their spirits from the whole of dark dependencies which are related to material world and to pure their spirits by good behavior and admirable actions and to decorate the levels of science and practice for achieving to the understanding of happiness's and intellectual enjoyments. (Ibid 1984/2/book 4/ p. 139). Mulla Sadrā said about the maintaining of abstract thoughts that: "Every thought which invites human to the obedience is divine and what invites to the guilt is satanic. Human can rely on his Allah (Good) based on the familiarity with the carnal soul tricks. (Ibid, 1984 /2/ p. 53).

### **The Theoretical (Intellectual) Training of the Carnal Soul**

Averroes in the intellectual dimension also focused on actuality of potential aspects of training. He acknowledged that everyone according to its nature has material intellect and what recognizes as potential doesn't actualize unless in the gradual stream. He presented theoretical intellect's levels like as his ancestors. Averroes believed that human intellect has inherent potentiality for accepting of Agent intellect's connection. He believed that this connection is possible for everyone. (Averroes, 1994: pp. 28-36). On the other hand, he believed that the material intellect actualizes imaginal forms by active light as the actual intellect and it is through this way that the human carnal soul connects to the actual intellect. According to Averroes, he aimed to develop material Intellect and it is the same thing that we can call training, because the training isn't but development and here intellect training is considered. Mulla Sadrā like Averroes has sufficient consideration to Intellectual training and like as his ancestors believed that theatrical intellect's levels are: Material, Habitual, and Actual and Acquired Intellects. He acknowledged that the last stage of human development is promotion of the carnal soul and receiving to Acquired Intellect which is the stage of completing of scientific and practical powers

(Mulla Sadrā, 1984/6/ p.134). Also, Mulla Sadrā like as Averroes said that: the utmost of human spirits development and covering of powers and actualities is connection to Active Intellect. (Ibid, /4/book 1. p. 461). He talked about human spirit's happiness that rational soul's upper level is to become united with universal intellect that human happiness exists there. (Ibid, 1987, p. 586). With comprising two philosophers' approaches clears that both of them have close approach in the theoretical training or intellectual dimension of intellect and both of them believed that the aim of training is connection with Active Intellect.

### **Barriers of Training of the Carnal Soul According to Averroes and Mulla Sadrā**

Averroes, explicitly, acknowledged the reason of human mistake that we can called them the carnal soul training's barriers:

- a) Deficiency in Nature.
- b) Disordering in presentation of making proofs.
- c) Domination of passions.
- d) Lack of guide and leader.
- e) Whole of above mentioned. (Averroes, 1977, p.18).

Mulla Sadrā considered these concepts in his different books. We point some of them here: In "Four Books" (Asfar-e-Arba') believed that barriers of human in achieving to happiness are two: a) Substantial Deficiency of the carnal soul and b) Substantial Maliciousness of spirits which is a result of numerosness of guilty. (Mulla Sadrā, 1984/2/ book 4, pp. 128- 132). Mulla Sadrā in the same book mentioned that the barriers of intelligible forms in the spirit nature are:

- a) Deficiency of spirit nature and its potentiality.
- b) Darkness resulted in passions and guilt. Deviation from the facts world and being absorbed to material world.
- c) The cover which is between the carnal soul and intelligible forms because of wrong ideas which is resulted from emulation and dogmatism. (Ibid, 8/ pp. 105-6). Finally, he in the book of "Three Principles" believed that there are three barriers in the training and development of the carnal soul:
  - a) Lack of obtaining of the carnal soul knowledge. (Mulla Sadrā 2002, p. 15).
  - b) Interesting in eminence, wealth, passion, pleasures and other interesting of the bestial soul (Ibid: 28).
  - c) Beguiling of concupiscence and cheatings of

Satan. (Ibid 32).

By observation two philosophers thoughts about the training barriers clears that two philosophers viewpoints are close. i. e. they believed that the lack of nature, numerousness of passions and guilt and finally the lack of cognition are the training barriers.

## CONCLUSIONS

Comparison of these two philosophers' thoughts resulted in that training is to become actualization and becoming developed things that are apt to these actualization and development. Also, we can understand these comparisons that obtaining of happiness (either spiritual happiness or social happiness) and acquiring of cognition indicate the importance of the carnal soul in these philosophers' thoughts. Division of souls and becoming intended in religion is important in Averroes viewpoint. Also, the main aim of philosophy according to Mulla Sadrā is existence and confirmation of substantial motion and humans achieving to the level of perfect human due to training of soul.

Averroes has considered theoretical training more than practical training and he against Mulla Sadrā hasn't considered describing human soul's powers. Mulla Sadrā has divided human soul's faculties. Mulla Sadrā divided human souls' faculties into intellectual, concupiscible, anger faculties and believed that the aim of practical training is achieving to moderation and this is possible when the concupiscible and anger faculties and resentment powers are at the dominance of the intellect. Also, we can result that obeying to religion and ethics and obtaining of rational sciences are strategies which are presented by two philosophers for soul training. But Mulla Sadrā, in addition to these above mentioned cases, believed that acquiring of science and practice and maintaining in doing fairs are need for soul training. Also, it should be noted that Mulla Sadrā more than Averroes believed in mystic method. However, the approaches of two philosophers are very close. In addition, we should pay attention to that the lack of nature, numerousness of

passions and gilts and the lack of real cognition are the most important behaviors in the carnal soul training. In sum, the educational pattern which is presented by Averroes and Mulla Sadrā can have an important role in the aims of training.

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*Full Length Research*

## Teaching Science for Thai Teachers in the 21<sup>st</sup> Century

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Advancement in technology, neurology research outcomes, and reactions on 21<sup>st</sup> century learning skills paradigm shift in the education business. Education administrative including higher order thinking skills for the learners including technological skills, using administrative real life the ability of learning. So, learners can be ready for practical opportunities in the future and the value added and empowered.



**Key words:** Teaching Science, the 21<sup>st</sup> Century, STEM Education

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### INTRODUCTION

The world of education has undergone changing tremendously in the 21<sup>st</sup> century. The tools for knowledge seeking play more crucial roles than the knowledge content. Technology advancement allows learners' control for self-activated learning through many available learning sources at their own pace of time. So, classroom atmosphere is apparently deviated from the traditional ones where learners holding laptop, tablet, iPad, and extensive types of smart phones. Teachers in this circumstance therefore need to change their role from

knowledge transmitter standing in front of the class to teachers as facilitators stimulating and facilitating conveniences in learning in order to empower their learning at the maximum capacity. Through this education paradigm shift, the conceptual framework for education has also been transformed. So, this paper aims to present 4 issues based on the concept of STEM Education and the outcome of implementing STEM Education in oversea countries. Also being presented is components of knowledge and skills for 21<sup>st</sup> century

education, and guidelines developing 21<sup>st</sup> century learning for Thailand education through STEM Education.

### Definition, Concept, and Characteristics of STEM Education

STEM Education is an interdisciplinary integration of various disciplines including Science(S) Technology (T) Engineering (E) and Mathematics (M) that harmoniously incorporates distinct features and teaching methods of each discipline in order that the learners implement knowledge of every disciplines in problem-solving, researching, and developing many innovations by means of interdisciplinary learning management from teachers of different disciplines working together. This is because working and living in the real life needs the interdisciplinary integration not the disintegrated knowledge. In addition, STEM Education promotes development of vital skills in accord to globalization or skills needed in the 21<sup>st</sup> century (Dejarnette, 2012; Wayne. 2012; Breiner, Harkness, Johnson, & Koehler, 2012).

Learning instruction in STEM Education composes of

1. Interdisciplinary

- Science (S) places an emphasis on understanding of nature. Educational practitioners advise teachers to use Inquiry Based Science Teaching and Scientific Problem-based Activities which rather match with primary students than secondary or tertiary students as this might cause boredom and disinterest to learners. However, teaching Science based on STEM Education attract students' attention and activate their enthusiasm and challenge leading students an increase on confidence and gaining success in learning high level of Science.
- Technology(T) is a subject involving process, problem-solving, improving, and developing elements or processes in order to meet the needs of human through technological processes entitled Engineering Design or Design Process which is similar to inquiry-based method. So, technology is not limited to only computer or ICT as normally perceived by the public.
- Engineering (E) is the subject involving thinking, creating, and developing innovations

by students employing knowledge in Science, Mathematics, and Technology. People normally think that this subject is difficult to learn but research studies showed that even kindergartens can handle this subject successfully.

- Mathematics(M) is the subject not only involving counting numbers but also covering other vital components, first, Mathematical Thinking involves comparing, classifying/categorizing, patterning, and describing. Second, mathematical language involves children communicating thoughts or concept in mathematics using mathematical language such as more than, less than, smaller than, larger than, etc. Third, promote Higher-Level Math Thinking based on doing activities, playing toys or performing daily life activities.

2. Integration friendly for all class levels from kindergarten to high school. It has been found that the US mandated STEM as educational policy for all states. The findings indicated that teachers used Project-based Learning, and Design-based Learning. Highly excel students in doing works. In addition, implementing STEM learners enhance their some states in the US mandated STEM Education

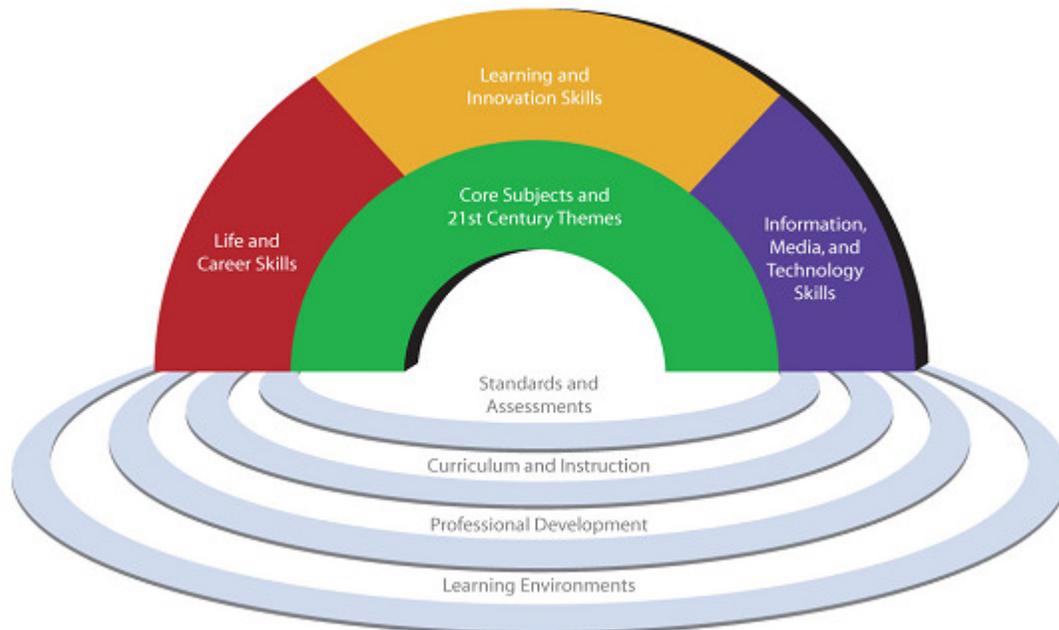
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STEM Education illustrates clear integration of 4 disciplines as aforementioned; however, it also incorporates Context Integration that involves daily life activities. Like this, it makes teaching meaningful to the learners and allows learners to see the values of learning and brings learning to benefit their daily life. So, this can lead to the value added and empowerment to the country economy.

3. Promoting learners' comprehensive development based on 21st learning skills.

- Cognitive skills refers to learners' comprehension of learning content
- Thinking skills refers to learners' developing higher-order thinking skills such as analytical thinking, creative thinking, etc.
- Teamwork skills refers to learners' ability in team working, effective communication, leadership, and open-minded for criticism and different opinions.





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crucial for  
advance

These skills are:

- Information Literacy
- Media Literacy
- ICT Literacy (Information, Communications & Technology)

4. Life and Career Skills refer to living life and work not require only individuals' knowledge and cognitive competence but also require individuals who are capable to work under complicated context and the required skills for this are:

- Flexibility and Adaptability
- Initiative and Self Direction
- Social and Cross-cultural Skills
- Productivity and Accountability
- Leadership and Responsibility

#### **Guidelines Developing Thailand Education based on STEM Education**

Education administration in Thailand has undergone

including qualitative and emphasis is on quality of on learning content scientific research outcome regarding and psychology on human learning for application into education administration at every level whether it be basic education and tertiary education by conducting research and employing the findings in reforming quality education administration. Setup academic seminar drawing participation from all parties involved to stimulate education practitioners to take account on importance of STEM Education and implement the approach to activate the movement in education policy with emphasis on empowering learners' important skills in 21<sup>st</sup> century. Teachers also need changes in teaching methods with concentration on learner-centeredness and variety of teaching styles in order to build necessary skills in the 21<sup>st</sup> century especially thinking skills such as integrated teaching with emphasis on project-based, research-based, etc. Upon the changes following Thai education trends can show readiness for Thai education in implementing STEM Education.

Implementing various approaches in reforming traditional education administration require Thai education practitioners, stakeholders, teachers, and administrators' comprehensive analysis and

understanding in STEM Education implementation in order to prevent misunderstanding that lends negative effects in future education administration or affects unsuccessful implementation. For example, many people perceive that STEM Education focuses only on teaching science and mathematics as found in regular curriculum. In addition, many people understand that STEM Education refers to researching and developing new instructional method promoting teaching and learning in specific discipline. Some people also view that STEM Education focuses mainly on core knowledge on science and mathematics while integrating technological and engineering knowledge for comprehensive acquisition. So, comprehensive understandings on STEM Education regarding advantages, research findings, and related components or factors are needed to be reviewed for successful implementation of STEM Education in Thailand (Rachel, 2008; Bybee, 2009; The Wheelock College Aspire Institute, 2010; Bybee, 2011; Rapporteur, 2011; Carr, Bennetti, & Strobe, 2011). These issues include:

1. Curriculum/learning content is interdisciplinary including science, technology, engineering, and mathematics. Successful implementation of STEM Education empowers students entering tertiary states of the US. Content, and learning resources that allow teachers access to search for media and learning resources. Teachers can use learning content and media conveniently. Research findings were used for curriculum improvement and revision. Thailand's readiness on 4 subject areas for STEM Education implementation on core basic education curriculum B.E. 2551, only science (S), technology (T), and mathematics (M) appeared readiness for implementation except engineering (E) which was found implicitly embedded in in technology and science subjects. So, explicit and consistent readiness of each subject area is important guidelines for teachers' implementation into lessons. In addition, readiness on media, lessons, explicit assessment and evaluation is also considered important for STEM Education implementation in Thailand.

2. Professional Development. Teachers play crucial roles in successful STEM Education implementation. Success stories among schools in the US involved were the results of teacher preparation and training in order to empower teacher's teaching capacity. Thailand, Institute for the Promotion of Teaching Science and Technology, who is in charge of developing curriculum on science, mathematics, and technology, involves in implementation planning for STEM Education by organizing training for

personnel in educational institutions, international conference, and inviting specialists for special education and research training. Effective teacher development plan allow school administrators and teachers clear understanding on STEM Education so they can implement STEM successfully. In addition, experts in higher education can play a role in developing teachers through mentoring system in order to help teachers in their community accurate knowledge and understanding. Teacher preparation process promote friendly learning environment and allow teacher to construct lessons that encourage students to take action on doing things themselves while teachers provide assistance on curriculum planning and scaffold teachers' confidence and positive attitudes towards STEM Education.

3. Preparing student teachers to become STEM Education teachers is important process. Research findings showed that one factor leading to failure in teaching science at primary level was teachers lacked confidence in teaching due to inadequate teaching background or knowledge in science. Students received very few experience in science but having been nurtured substantial knowledge on rules or science theories. Student teachers should focus on 4 subject areas such as science, technology, engineering, and mathematics. Like this, student teachers should provide clear understanding on STEM Education in order to benefit student teachers. Appropriate proportion allocation of teachers to students for quality of teaching. Coaching and mentoring system is also important to develop confidence on student teachers performing teaching practicum.

4. Institutional preparation refers to preparing educational institutions and school administrators for STEM Education implementation as this process requires professional administrators in order to accommodate the administration strategically. This process aims at developing classroom instruction and allowing participation of all parties involving in sharing ideas and administrating. School administrators must act upon a leader of change and maintain good relationship with family, community, and education institution. The leaders should be active and pay attention to the changes for development. The leaders should be ready for develop career advancement and ready for coordination and collaboration with others. The leaders should provide supports for classroom instruction and allow participation for outsiders to take roles in education administration.

5. Undertaking research studies in support and develop



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*Full Length Research*

# Dietary Energy Consumption and Dietary Diversity Access Scale in Kerala and Tamilnadu-A study

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The research was a cross sectional one and was conducted through structured interviews using a questionnaire, focus group discussions and key informant interviews. Using DEC per adult equivalent and per capita both per day, it was found that 84.2% and 81.8% of the 400 sampled households were food secure respectively. Using HFIAS and DD, 88% and 31.8% were food secure respectively. It is concluded that DEC per adult equivalent per day, per capita per day and HFIAS give almost similar food security incidences and have good potential to give reasonable results of food security status, while DD tends to exaggerate food insecurity incidences. It is recommended that the government and other stakeholders dealing with food security should use both DEC per adult equivalent, DEC per capita per day and HFIAS almost equally since they give almost similar results. Besides, effort should be made to establish international cut off points and food items to include in the classification of households into food secure and food insecure based on DD.

**Key words:** Food security, dietary energy consumed, dietary diversity, household food insecurity access scale.

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## INTRODUCTION

Food security remains the world's fundamental challenge for human welfare and for economic growth. It is estimated that 805 million of the global population were chronically undernourished in 2012-14 (FAO, 2014). Of these, 1.8% were inhabitants of developed regions; 34.3% were inhabitants of Southern Asia; 26.6% were inhabitants of Sub-Saharan Africa; 20% were inhabitants of Eastern Asia; 7.9% were inhabitants of South Eastern Asia; 4.6% were inhabitants of Latin America and Caribbean; 2.3% were inhabitants of Western Asia; 1.6%

were inhabitants of Northern Africa; 0.7% were inhabitants of Caucasus and Central Asia while 0.2% were inhabitants of Oceania (FAO, 2014). In Tanzania, statistics show that in 2011/12, about 9.7% of the people were food insecure (NBS, 2014).

Overall, Tamilnadu's food security situation appears to be improving (FEWS NET, 2010; WFP/WB, 2013). With respect to national food security, which has been self-

sufficient in food production since 2005 with a peak of 112% in 2007 (URT, 2011). Tanzania is mainly an agricultural country and produces a significant amount of food. Agriculture is the backbone of. In 2010/2011, on average, 37% of households' food energy came from their own production while 60% was purchased from shops and markets (WFP/WB, 2013). In 2012, the Ministry of Agriculture Food Security and Cooperatives (MAFC) reported that food requirements indicated that, overall, the country would attain a Food Self Sufficiency Ratio (SSR) of 113% for the year 2012/13 (URT, 2012). That SSR was slightly above that of the 2011/12 agricultural season, which was 112%.

Food security is not a new concept; it has been defined in a variety of ways by different authors and organizations. Food security is achieved when "all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life" (FAO, 2015). The converse of this definition is food insecurity, which is inability of people to have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active life. Food security and food insecurity use the same indicators; Below a given threshold on those indicators there is food insecurity while there is food security at and above the threshold, for example a cut-point of 2,100 kcal per capita per day. Food security is a concept that has evolved considerably over time. This evolution has resulted into the development of different indicators of food security analysis. For example, one volume on household food security by Maxwell and Frankenberger (1992) lists 25 broadly defined indicators. Hoddinott (1999) suggested roughly 450 food security indicators. Maxwell (2008) suggested that, wherever possible, the use of more than one food security indicator is advisable because one indicator can not wholly explain the food security status of a household.

Generally, researchers and other development practitioners face some methodological challenges as to which indicators are appropriate when it comes to determining food security. The challenge is driven by lack of a "gold standard measure" of food security (Coates, 2004). Measures of consumption, poverty, and malnutrition are all used as proxy measures, and an indicator of assets and income are used as more distal determining factors (Maxwell *et al.*, 1999). All measures are related to food security; yet none of them captures the concept accurately or completely. This is because food security, in the words of Maxwell *et al.* (1999), is probably too complex to ever adequately be captured by a single indicator (Ndobo, 2013; Zemedu and Mesfin, 2014). It is, therefore, important to search for reliable and cost effective indicators to use based on four pillars of food security (availability, access, utilization and

stability). The paper focuses on measuring food sufficiency based on actual food intake as dietary energy consumption and food access based on dietary diversity and household food insecurity access scale (HFIAS).

In practice, the indicator most commonly used to assess access to sufficient quantity of food is dietary energy intake. Energy intake data can be obtained by weighing and measuring food consumed by the household in the reference period (IFPRI, 2006; Bazezew, 2012). Dietary energy consumed (DEC) in terms of kilocalories can be expressed per capita or per adult equivalent, both per day. When dietary energy consumed is expressed per capita per day, a household is said to be food insecure if it consumes less than 2,100 kcal per capita per day, which is the global average DEC per capita per day (Devereux, 2006; Bogale and Shimelis, 2009). The single most important indicator of food adequacy level of a community is the per capita dietary energy supply measured in kilocalories (Bazezew, 2012). When energy intake is expressed per adult equivalent per day, a household is said to be food insecure if it consumes less than 2,280 kcal per adult equivalent per day. This amount is recommended by the World Health Organization that the minimum dietary energy intake per day per adult should not be less than 80% of the adequate daily caloric intake of 2,850 kcal (Wanmali and Islam, 2002). The above amount (2,280) is 80% of the 2,850. In Tanzania, however, the minimum recommended dietary energy intake is 2,200 kcal per adult equivalent per day (NBS, 2014). Bazezew (2012) pointed out that households' calorie intake might be greater than 2100, but the availability of food could be from cereals and/or protein only. In that sense, dietary diversity is considered to be a good measure of dietary quality.

Another measure of food security is dietary diversity. Dietary diversity (DD) is correlated with levels of caloric acquisition (Hoddinott, 2002; Bazezew, 2012). Dietary diversity is defined as the number of different foods or food groups consumed over a given reference period (Hoddinott, 1999; Ruel, 2002). Based on the assumption that no single food can contain all nutrients, DD has been conjectured to have a greater practical potential of meeting nutrient requirements (Labadarios *et al.*, 2011). This could be an indicator of nutrient adequacy and an outcome measure of food security (Hoddinott, 2002) for the main pillars of food security (availability, access, utilisation and stability), which are also positively reflected in DD (Ajani, 2010). At the household level, Vakili *et al.* (2013) and FAO (2013) suggested that DD can be used as a proxy indicator of food access (e.g. of households' capacity to access costly food groups). DD is measured by summing up the number of different foods or food groups consumed over a reference period. Hoddinott (2002) measured DD by calculating a weighted sum, whereby the weights reflect the frequency

of consumption and not merely the number of different foods. The reference period usually ranges from one to three days, but seven days is also often used (FAO, 2011), and periods of up to 30 days have been reported (Hoddinott, 2002). In the context where a 2 weeks' intake can be accurately assessed, this reference period is likely to provide even better estimates (Drewnowski *et al.*, 1997). In most developing country contexts, however, a 7 days' recall may be the longest reference period achievable from a practical point to minimize memory error (Ruel, 2003). This recall period is too short to get accurate data on dietary diversity. The plausible explanation is that in rural areas many people have low income which limits their ability to buy a wide variety of food to diversify their diet. This might be the reason why Hoddinott (2002) proposed a recall period of up to 30 days in order to increase dietary diversification.

DD can be measured using various approaches. Researchers in China (e.g. Taren and Chen, 1993; Tarin *et al.*, 1999) used food group counts, while studies from Ghana and Malawi (Fegurson and Sprecher, 1997) and in Kenya (Onyango *et al.*, 1998) used the number of individual foods consumed. Studies from Mali (Hatloyet *et al.*, 1998), Viet Nam (Ogle *et al.*, 2001), Burkina Faso (Savy *et al.*, 2005) and Tanzania (Keding *et al.*, 2012) used both single food counts (called Food Variety Score [FVS]) and a food group count called Dietary Diversity Score [DDS]. Studies in South Africa (Labadarios *et al.*, 2011; Taruvinga *et al.*, 2013) and India (Srivastava *et al.*, 2014) used Dietary Diversity Score. Despite the well recognized importance of dietary diversity, there is a lack of consensus on how to measure and operationalize DD (Ruel, 2003). According to Ruel (2002, 2003), further research should be carried out to validate and compare indicators based on alternative food and food group classification systems, scoring systems, reference periods and cut-off points. It would be useful to continue to explore whether indicators based on food groups (a simpler approach) perform as well as those based on individual foods in predicting outcomes of interest. Another measure of food security is Household Food Insecurity Access Scale (HFIAS) (Coates *et al.*, 2007). Household food access is defined as the ability to acquire sufficient quality and quantity of food to meet all household members' nutritional requirements for productive lives (Saaka and Osman, 2013). HFIAS is a continuous measure of the degree to which food insecurity (access) in the household in the previous 30 days (Nyikahadzoi *et al.*, 2013). According to Coates *et al.* (2007), the HFIAS reflects the three universal domains of household food insecurity that is anxiety about household food insecurity, insufficient quality and insufficient quantity of food supplies. This indicator captures the household's perception about their diet regardless of its nutritional composition (Coates *et al.*, 2007). This food insecurity measure focuses on consumption related

strategies and captures the household's behavioural and psychological responses to food insecurity or perceived food insecurity. The HFIAS is based on the assumption that households' experiences of food insecurity cause predictable reactions and responses that can be captured and quantified through a survey and then summarized into a score.

Measuring food security incidences using different methods is paramount. This is due to the multidimensional nature of food security (Bazezew, 2012). Researchers in Tanzania (e.g. Kayunze *et al.*, 2010) determined dietary energy consumed per capita and per adult equivalent per day from maize and rice consumed based on one week's, 30 days' and one year's data in Rufiji District, Tanzania. Mende *et al.* (2014) determined food security using monetary values of food consumed and dietary energy consumed per adult equivalent per day using 28 days' data in Makete and Mbeya Districts. Ngongi and Urassa (2014) determined dietary energy consumed per adult equivalent based on all foods and dietary energy consumed per capita per day based on grains and number of meals from 24 hour recall period, household income expenditure survey (HIES) for 30 days, amount of grains stored, monetary food poverty per adult equivalent for 28 days, and HFIAS from 7 days' data in Kahama District, Tanzania. However, comparing food security incidences based on dietary energy consumed from all foods, dietary diversity and household food insecurity access scale based on 30 days' data has not been done at least in Tamilnadu. Therefore, the research for this paper was done to determine food security incidences based on dietary energy consumption, dietary diversity and household food insecurity access scale in Chamwino District, Tanzania, with the specific objectives to: determine dietary energy consumption per adult equivalent and per capita, determine household dietary diversity, measure food access by using household food insecurity access scale (HFIAS) and compare food security incidences based on the four methods of food security determination.

### **Contribution to knowledge**

This study contributes to new knowledge by establishing cut off points for measuring DD using weighted sum dietary diversity. Food groups to include in measuring DD based on local availability were developed.

## **METHODOLOGY**

### **Description of the Study Area**

The study was conducted in Tamilnadu District. The district was selected since it had a history of chronic food

insecurity for the previous five years (2009-14) (DAICO, Thanjavur District, personal communication, 2014). In 2012 the district was among food insecure districts in Tamilnadu (URT, 2012). Need for food aid from the government has been increasing since 2009-14. Generally, food aid in tonnes for the above period was 93.8 (2009/10), 25 (2010/11), 53.8 (2011/12), 69 (2012/13) and 10 (2013/14).

### **Research Design, Sampling Procedure and Sample Size**

A cross-sectional research design was used to collect data used for the current paper. Based on the nature of the study and absence of longitudinal data, the above design was best suited (Ngongi and Urassa 2014). Moreover, literature (Babbie, 1990; Bailey, 1998) shows that cross sectional design can provide information that is useful for descriptive purposes as well as for determination of relationships between and among variables. Further to the above, a cross sectional research design is cost effective and allows inclusion of participants or groups of people from whom a comparison can be made (Matthew and Ross, 2010). The sampling unit for this study was a household since food scarcity is ultimately experienced at the household level (Maxwell, 1996). Chamwino District was selected purposively because of its history of chronic food insecurity. Three wards were selected purposively. Six villages were selected randomly. These included Fufu Ward (Fufu and Suli Villages) and Idifu Ward (Idifu and Miganga Villages) where chronic food insecurity was relatively high and Membe Ward (Membe and Mlimwa Villages) where chronic food insecurity was relatively low. The selection criterion of these villages was based on a history of receiving food aid from the government (DAICO of Chamwino District, personal communication, 2014) (Appendix 4). The respondents were selected randomly from the sampling frames which were constructed from the village registers. The sample size was 400 households. The formula for sample size determination by Cochran (1977, cited by Bartlett *et al.*, 2001) was used to determine the sample size as indicated in Appendix 1. In addition, 13 key informants were purposively selected based on their positions and being considered to have much knowledge and experience about food security in the research villages.

### **Data Collection**

Primary data were collected using a questionnaire, which was administered to household heads. Key informant interviews were held with people who were considered to have in-depth understanding and knowledge on food

security in the district. Key informants included one District Agricultural Irrigation and Cooperatives Officers (DAICO), six village and ward extension officers, three village government leaders and three Ward Executive Officers (WEO). Twelve focus group discussions were conducted in the 6 villages (2 FGD per village) with 8 to 10 villagers. The FGD participants were a mixture of old and young farmers, the youth and women, and villagers doing various activities. In this study, secondary information was collected through reviewing literature on the state of food insecurity in Tanzania and reports on the trend of food aid from Chamwino District Office. A person responsible for meal preparation was requested to provide information on all types of foods consumed by the household in the previous 30 days prior to the survey date, including items consumed outside home (Appendix 3). Information on household food security was collected using a questionnaire which included a validated nine item household food insecurity access scale. HFIAS was used to assess whether households had experienced problems in accessing food during the reference period of 30 days prior to the survey date. A person responsible for meal preparation was interviewed to provide information on the modifications a household made in the diet or food consumption patterns due to limited resources to acquire food.

### **Data Processing and Analysis**

Qualitative and quantitative methods were employed to analyze collected data. Qualitative data were analyzed by being summarized by their themes, and comparing and contrasting arguments given by different interviewees. Quantitative data collected were analysed using the Statistical Package for Social Sciences (SPSS) and Microsoft Excel software. The data were analysed by computing descriptive statistics to determine frequencies, percentages, statistical means, and standard deviations of individual variables. Descriptive analysis was used to determine dietary energy consumption per adult equivalent and per capita, household dietary diversity, and food access by using household food insecurity access scale.

### **Adult Equivalent Units Computation**

Cognisant of the fact that if variables like income and dietary energy consumed are expressed per capita they do not reflect good comparative figures in households with different sizes and composition by age and sex, DEC was expressed per adult equivalent following the procedure used by Collier *et al.* (1990). In order to calculate adult equivalent units, the sex and age of every household member were recorded. A two-step procedure

was followed whereby in the first step adult equivalent scales for East Africa by age and sex were added up for all household members to get all the household members in terms of adult equivalents. The equivalent scales are presented in Appendix 2. The second step involved adjusting the above adult equivalents for economies of scale due to the fact that larger households need fewer resources per person due to sharing some facilities. The economies of scale are taken into account by multiplying the adult equivalent units by the average cost (Appendix 2) corresponding to the number of people in the household. The adjusted adult equivalent units were used as denominators for calculating values per adult equivalent in particular households.

### **Determination of Dietary Energy Consumed**

In order to determine food security based on dietary energy consumed per adult equivalent and per capita, all food items consumed by all household members were used. Based on data collected using a household questionnaire, quantities of all food items consumed for 30 days were recorded. Quantities of dietary energy consumed in all the food items were computed based on Tanzania Food Composition Tables by Lukmanji *et al.* (2008). Dietary energy consumed was adjusted for the number of individuals in the household based on sex and age. Appendix 2 gives the adult equivalent scales that translate children into adult equivalents and also compare women and men. Moreover, household size is represented by the number of adult equivalents rather than simply the number of individuals. The basis for such translation has mostly been the nutritional requirements of individuals by age and sex. Based on these adjustments, the quantities of DEC by all household members were expressed per adult equivalent units per day and per capita per day based on all foodstuffs consumed for 30 days. In this case households were said to be food insecure if they had consumed less than 2200 kCal per adult equivalent per day or less than 2100 kCal per capita per day.

### **Determination of Dietary Diversity**

In this study, a weighted sum of dietary diversity is adopted. In this context, a person responsible for preparation of food was asked to indicate different foodstuffs (e.g. maize, sorghum, vegetables) the family had eaten in the previous 30 days. The foodstuffs were location specific and, in this study, food groups were developed from focused group discussions. The score (Appendix 3) was done using the following categories: 16-30 days in the previous month (score of 24) i.e. at least every other day; 4-15 days in the previous

month (score of 10) i.e. once or twice a week; 1-3 days in the previous month (score of 3) and 0, i.e. not at all (score of 0). The dietary diversity index was achieved by the calculation of the weighted sum adopted from Hoddinott (2002). The following weights were assigned: J: 24; S: 10; M: 3 and R: 0. However, it is important to note that Hoddinott (2002) did not indicate the reasons for use of the letters J, S, M and R for weighting scores of dietary diversity. It is plausible that such letters were used for convenience purposes in data coding and analysis. There are no internationally accepted cut-off points below those cut-off points to assist in making judgments on whether households below a certain dietary diversity score have low dietary diversity or not. According to Ruel (2002, 2003), the international cut off points to define high or low diversity are likely to be meaningless. Cut-off points to define varying levels of diversity have to be defined in the context where they are used, taking into account local food systems and dietary patterns. It is important to define in each context the set of foods and food groups that can contribute to improve dietary quality. This study classified households into two categories: A household was said to be food insecure if the weighted sum score was less than 126.54 and food secure if the weighted sum score was above 126.54. The cutoff of 126.54 was chosen because it was the mean weighted sum score in the sample. Using the mean of the sample to establish cutoff points has been used by Saaka and Osman (2013) in determining food consumption score based on dietary diversity in Ghana.

### **Determination of Food Access by Using Household Food Insecurity Access Scale (HFIAS)**

Food access was measured through HFIAS, which is an adaptation of the approach used to estimate the prevalence of food insecurity in the United States of America (Coates *et al.*, 2007). The HFIAS was developed for use in developing country settings, and it is a tool that asks respondents about three domains of food insecurity: (1) experiencing anxiety and uncertainty about the household food supply (2) altering quality of the diet and (3) reducing quantity of food consumed (Coates *et al.*, 2007). The tool consists of nine questions that ask about changes households made in their diet or food consumption patterns due to limited resources to acquire food in the preceding 30 days. Based on the responses given to the nine questions and frequency of occurrence over the past 30 days, households are assigned a score that ranges from 0 to 27. A higher HFIAS score is indicative of poorer access to food and greater household food insecurity. For this analysis, households were classified into two groups based on overall distribution of the HFIAS in the sample. The lower the score, the higher the food security situation in the household.

Consequently, a score of 17 and less was classified as food secured and a score of more than 17 was classified as food insecure. HFIAS allows assessment of food poverty (i.e. the inability to obtain healthy and affordable food).

## RESULTS AND DISCUSSION

### Incidence of Food Security Based on Dietary Energy Consumed per AE per Day

The results on food secure and food insecure households based on DEC per adult equivalent showed the mean of 3,573.4 kcal per adult equivalent per day. They also showed minimum and maximum values of 1,530.3 and 6,461.0 kcal per adult equivalent per day respectively and a standard deviation of 862.0 kcal per adult equivalent per day. The results in Table 1 further show that 84.2% of the households surveyed were food secure while 15.8% were food insecure.

### Incidence of Food Security Based on DEC per Capita per Day

The results on food secure and food insecure households based on DEC per capita showed the mean of 2,351.2 kcal. They also showed minimum and maximum values of 1,035.3 and 4,185.5 kcal per capita per day respectively and a standard deviation of 537.5 kcal per capita per day. The results further showed that 81.8% of the households surveyed were food secure while 18.2% were food insecure (see Table 1). These results are slightly different from those of DEC per adult equivalent per day. These results show that the incidence of food insecurity was slightly higher. The probable explanation is that the value of 2,100 kcal which is used as a cutoff point in measuring DEC per capita is too close to the value of 2,200 kcal per adult equivalent per day which is used in Tanzania. The international cut off point is 2,280 kcal per adult equivalent per day (Wanmali and Islam, 2002). Besides, if you take the mean kcal eaten per day per household which was 13,932.3 kcal and divide it by the mean household size which was 5.90, the answer is 2,361.4 kcal. However, if you take the mean kcal eaten per day per household, which was 13,932.3 kcal and divide it by the mean adult equivalents, which was 3.845, the answer is 3,625.4 kcal. There is a huge difference between the two answers. Therefore, it is quite possible that measuring food security using DEC per capita tends to exaggerate food insecurity compared to measuring DEC per adult equivalent. Moreover, measuring food security using DEC per adult equivalent per day takes into consideration the caloric requirement by age and sex of every household member while

measuring DEC per capita per day takes the absolute number of household size.

### Incidence of Food Security Based on Dietary Diversity

The results on food secure and food insecure households based on DD showed the mean of 126.54 weighted sum scores. They also showed minimum and maximum values of 72 and 295 respectively and a standard deviation of 46.60 weighted sum scores. The results in Table 1 showed that 38.8% of the household surveyed were food secure while 61.2% were food insecure. These results show that many households in the study area were consuming a limited dietary variety. It is apparent that poor dietary variety is a feature of many developing countries (Labadarious *et al.*, 2011). Several studies have suggested a positive association between household income and dietary diversity (Ruel, 2002). Households in the study area were constrained in terms of cash, which could be used for buying foods in order to diversify their diet. During FGDs they reported that household income from the sale of crops was decreasing because the food was available in the markets and shops. The income farmers were getting from the sale of crops had declined, according to 2007 Household Budget Survey, from 60% in 2000/01 to 50% in 2007 (NBS, 2009). Moreover, during FGDs it was reported that a few households were buying foodstuffs from market places and shops.

### Incidence of Food Security Based on Household Food Insecurity Access Scale

The results on food secure and food insecure households based on HFIAS showed the mean of 12.65 scores. They also showed minimum and maximum values of 4 and 27 respectively, the standard deviation being 4.05 scores. The results in Table 1 show that 88% of the households were food secure while 12% were food insecure. These results indicated that the majority of households had enough access to food. During FGDs they reported that they were accessing food through production, purchasing and assistance by relatives. During focus group discussion it was pointed out that a few households were buying food from shops and markets due to low income at the household. Additionally, during FGDs it was pointed out that all households owned land which was used for crop production. During focus group discussions they reported that all households had access to, and were collecting, various wild foodstuffs which included vegetables, fruits and small animals. Both vegetables and fruits were reported in Gogo language. Wild vegetables included *kidingulio (Aloe nutii)*, *mhilile (Cleome*

**Table 1:** Food security based on the four methods of food security determination

Food security status	Frequency	Percentage
<b>Incidence of food security based on DEC per AE per day</b>		
Food secure	337	84.2
Food insecure	63	15.8
<b>Total</b>	<b>400</b>	<b>100</b>
<b>Incidence of food security based on DEC per capita per day</b>		
Food secure	327	81.8
Food insecure	73	18.2
<b>Total</b>	<b>400</b>	<b>100</b>
<b>Incidence of food security based on dietary diversity</b>		
Food secure	123	30.8
Food insecure	277	69.2
<b>Total</b>	<b>400</b>	<b>100</b>
<b>Incidence of food security based on Household Food Insecurity Access Scale</b>		
Food secure	352.0	88.0
Food insecure	48.0	12
<b>Total</b>	<b>400</b>	<b>100</b>

*hirta*, *mzimwe* (*Gynandropsis gynandra*) and *ilendi-lya mhonejela* (*Sesamum angolense*) (Ruffo *et al.*, 2002). Wild fruits included *mpela* (*Adansonia digitata*), *msisi* (*Tamarindus indica*), *mgwelu* (*Grewia fallax*), *mhafuta* (*Grewia hexamita*), *mfulu* (*Vitex doniana*, *Vitex ferruginea* and *Vitex payos var. payos*) and *mpelemehe* (*Grewia platyclada*) (Ruffo *et al.*, 2002). Wild animals included Dikdik (*Madoqua kirkii*), Impala (*Aepyceros melampus*), Hare (*unidentified species*), Helmeted guinea-fowl (*Numida meleagris*), Bush pig (*Potamochoerus porcus*), Francolin (*unidentified species*), Dove (*unidentified species*) and African civet (*Civettictis civett*). The mentioned foods show dietary diversity. However, wild fruits and vegetables are available seasonally. Vegetables and some fruits are plenty during rainy season and decrease during dry season. During focus group discussion they reported that they usually collect wild vegetables during rainy season. They process these vegetables by drying and storing them for consumption during dry season. This was further confirmed during focus group discussions whereby they reported that the number of meals of wild vegetables was 2 to 3 per day. Wild animals are available but occasionally.

#### **Figure 1: Food Security Levels Based on four methods of Food Security Determination**

The results showed that food insecurity incidences in Chamwino District based on DEC per adult equivalent and per capita, DD and HFIAS were much higher than

the national levels of food insecurity in Tanzania, which was 9.7% in 2011/12 (NBS, 2014). The high food insecurity incidences based on DD (See Figure 1) could be due to methodological problems because food groups were developed during FGDs based on the local classification system according to the foods which were available and could contribute to improved diet in the study area. The cut off points were established using the mean score on DD in the sample. Moreover, high food insecurity obtained using DD could be due to low agricultural diversity in Chamwino District and also because only one ethnic group with similar food habits dominates the district. It is argued that strong food habits can not be affected by poverty. However, income level has been reported to have positive influence on food habits (Dunneram *et al.*, 2013). For example, Dunneram *et al.* (2013) found that health foods were consumed by high income earners compared to low income earners among Mauritians in Mauritania.

Unlike urban people who depend more on food from purchasing from shops, supermarkets and market places; rural people mainly depend on own production of food. Such dependence has been reported by some scholars. For example, Olney *et al.* (2009) reported that homestead production has a direct positive impact on dietary diversity, and Keller *et al.* (2005) reported that Kongwa and Singida had low dietary diversity due to low agricultural diversity. Chamwino District has semi-arid characteristics like Kongwa and Singida. These three districts (Kongwa, Singida and Chamwino) are found in the same agroecological zone. In spite of own production having direct and positive impact on dietary diversity,

Ruel (2002) argues that household income is positively related to dietary diversity. In areas with low agricultural diversity, dietary diversity could be improved by purchasing foods from market places and shops. During FGDs it was said that a small proportion of households were buying foods from market places and shops. Moreover, it was pointed out that household income from the sale of crop products was decreasing because, during the survey, food was available in market places, shops and households. Besides, a large proportion of households from four out of the six surveyed villages (Fufu, Idifu, Miganga and Mlimwa) had food stored in their households. However, in two villages (Suli and Membe) a large proportion of households had no food stored in their households. At Suli, most of the produce (sorghum and bullrush millet) was devoured by destructive birds. At Membe, they depended much on maize production, but during the agricultural season covered by the research (2013/14) they didn't harvest any grain due to extended drought.

DEC per adult equivalent and per capita per day and HFIAS gave almost similar results of food security incidences, although slightly more food insecurity incidences were obtained using DEC per capita per day. The results on DEC per adult equivalent per day showed that 84.2% were food secure while 15.8% were food insecure. The results on DEC per capita showed that 81.8% were food secure while 18.2% were food insecure. The results on HFIAS showed that 88% were food secure while 12.0% were food insecure. The results on DD showed that 38.8% were food secure while 61.2% were food insecure. These results of food insecurity incidences were higher than the national levels of food insecurity in Tanzania, which was 9.7 % in 2011/12 (NBS, 2014). Of all the methods in Fig.1, DEC per adult equivalent and per capita per day and HFIAS gave the best results in determining food security incidences. Incidences of food security based on kCal per adult equivalent and per capita being different has also been reported by Kayunze *et al.* (2010); they attributed the differences to kCal per adult equivalent being based on adult equivalent units, the determination of which is subjective.

## CONCLUSIONS AND RECOMMENDATIONS

Based on the findings of this study, it is concluded that DEC per adult equivalent per day, DEC per capita per day and HFIAS give almost similar food security incidences and have good potential to give reasonable results of food security status while DD tends to exaggerate food insecurity incidences. It is recommended that the government and other stakeholders dealing with food security should use both DEC per adult equivalent, DEC per capita per day and HFIAS almost equally since

they give almost similar results. Besides, effort should be made to establish international cut off points and food items to include in the classification of households into food secure and food insecure based on DD.

Based on food insecurity incidences which were higher than national levels, it is concluded that food insecurity observed in this study could be associated with limited access to food due to limited financial resources to access food. Accordingly, it is recommended that the government should support these households of Chamwino District through various non-farm activities in order to minimize financial constraints.

Based on the food groups which were developed during focus group discussion and using a weighed sum dietary diversity procedure to determine dietary diversity, it is concluded that most households were food insecure. Most households reduced the diversity of the food items they consumed due to cash constraints; this was reflected in lower scores on the measure of dietary diversity. Furthermore, using the weighted sum score procedure, local food systems limited generalization of the research findings. This is due to the fact that there is no agreed international cut off points and food classification system based on DD. Therefore, it is recommended that effort geared at alleviating household food insecurity could contribute to consumption of a wide range of food items at the household level. Besides, effort should be made to establish the international cut off points and foods to include in the classification system in order to enable generalization of the findings.

Food access which was measured using HFIAS gave low incidences of food insecurity compared to other measures of food security, leaving alone DD. Accordingly, it is recommended that the government and other stakeholders dealing with food security should use HFIAS because it is a good measure of food insecurity in several settings.

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**Full Length Research**

# Foodstuffs consumption among primary, middle and high school students in Kenitra city

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The excessive consumption of food products that are full of additives is responsible for more health problems for the new generation. The aim of the present study was to reach the preference and pattern of food consumption among children and students. Four modes of food consumption were proposed: daily consumption, weekly consumption, monthly consumption and no consumption. A survey was conducted over 417 persons (males and females). The tool used in this research was a questionnaire. It was distributed to students of different levels (primary, middle and high school). The results of the statistical analysis showed, that among 417, 88,82% of students consume packaged products either one time per day or one time per week. For The Multiple Correspondence Analysis (MCA) of the daily and weekly consumption of foodstuffs by gender and school level, it has revealed three groups for daily mode consumption and two groups for weekly mode consumption. Each group of the above (daily and weekly) consumes a certain food differently. For the most consumed products per day and gender, we have found both boys and girls consume milk and cheese. As for weekly consumption, boys have consumed more fruit juices. However, girls prefer soft drinks. According to the school level, high school students consume foodstuffs more than other groups.

**Keywords:** food products, consumption, survey, gender, school level.

Rhaïem N, Ijoub I, Lamine H, Ouhssine M (2016). Foodstuffs consumption among primary, middle and high school students in Kenitra city. *Inter. J. Acad. Res. Educ. Rev.* 4(3): 71-77

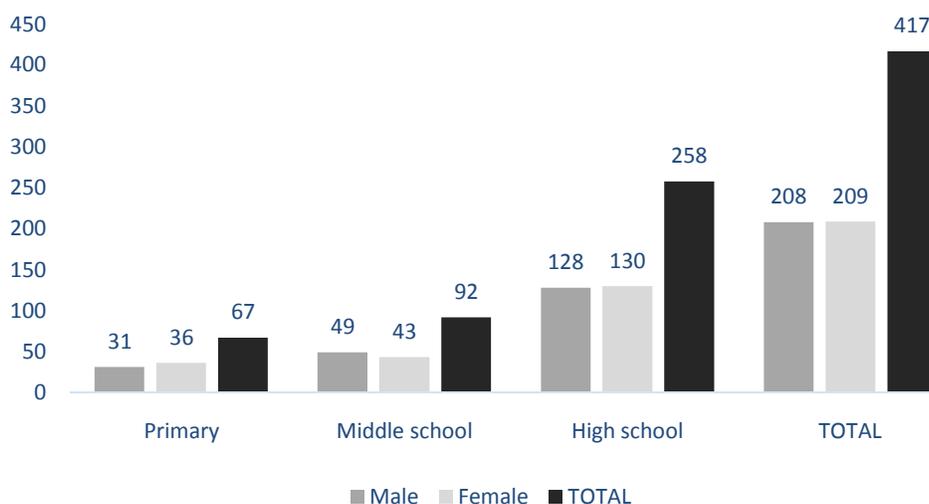
## INTRODUCTION

Foodstuffs (such as chips, ketchup, drinks, biscuits, milky products and others) are produced by the Industrial Technology of raw materials of agriculture and animals. They are intended for human consumption. Furthermore, the intensive exposure of the number of food products in the market has pushed consumers to explore the taste of each product; and eventually consume them. Recently, scientific researchers noted the significant increase in cases of allergies, intolerance and hypersensitivity [1, 2] following the ingestion of these foods among consumers.

The objective of this study is to determine the consumption mode of food products and to find out the most consumed products by students aged between 7-18 years.

## MATERIALS AND METHODS

The study was conducted at three public schools located in Kenitra city, and it examined 417 students who were divided into three groups:



**Figure 1:** Distribution of students by gender and school level

- \* Group 1: consists of students aged 7 to 10 years.
- \* Group 2: consists of students aged 11 to 14 years;
- \* Group 3: consists of adolescent students (15-18 years)

The selected students were asked to fill in a questionnaire that includes identification of gender, school level, and consumption mode. The list of 12 food products was proposed. The selected products are those that are available at the food markets. They consist of the following foods: chewing gums, fruit juice, sweets, chips, chocolates, biscuits, soft drinks, ketchups, marmalade, cheese, ice cream, mayonnaise and milk [4]. Students were asked to choose the consumption mode for these products. Basically, there were 4 modes: daily consumption mode, weekly consumption mode, monthly consumption mode and no consumption. The collected data was put in Excel and was subjected to statistical analyses involving adequacies of tests like Chi-Square test and Multiple Correspondence Analysis (MCA).

## RESULTS

The questionnaire was distributed to 600 students, and 183 surveys were discarded because of filling errors. The distribution of students by gender and school level is shown in Figure 1. The sex ratio (male / female) is balanced ( $p > 0,05$ ).

### Distribution of four Consumption Modes

The Figure 2 shows the distribution of 4 consumption modes of the food products among the two genders.

### Daily food products consumption

#### Food products consumption by gender

The results of the daily consumption frequency of food products related to gender are showed in figure (3). The analysis of this figure shows that the daily consumption of males is also different from females. Indeed, the most consumed foodstuffs are chewing-gums, sweets, marmalade, cheese and milk. Boys consume more soft drinks, sweets, chewing-gums, Ketchup, casher, marmalade, cheese and ice cream, but girls prefer to take fruit juices, cookies and drink more milk than boys (Figure 3).

#### Food products consumption by school level

The separate analysis of 13 selected foodstuffs according to the school level shows that the consumption among high school students is much greater than middle school students, and even primary school students (Figure 4).

### The result of MCA for daily food consumption

The overall analysis of daily food consumption among gender and school level by MCA is shown in graphic 5 (Figure 5).

Attached diagram of modality points.

The Multiple Correspondence Analysis (MCA) identified the following results:

- The first group of male students at middle and high school consumes large amounts of:

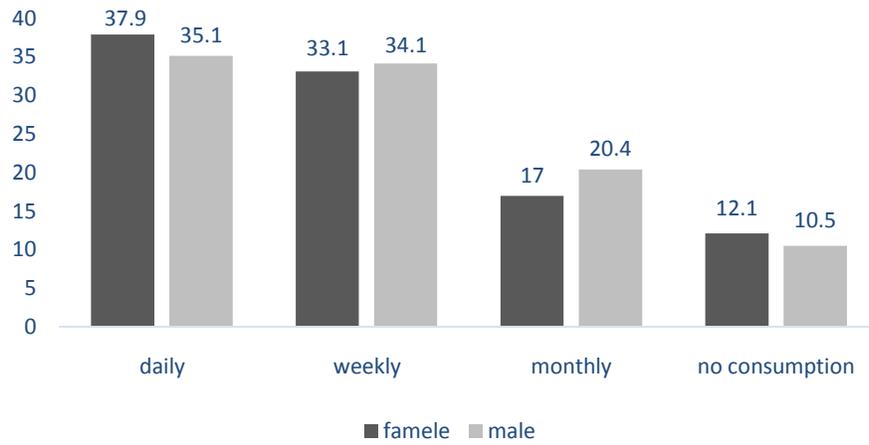


Figure 2: Distribution of surveyed students depending on consumption mode

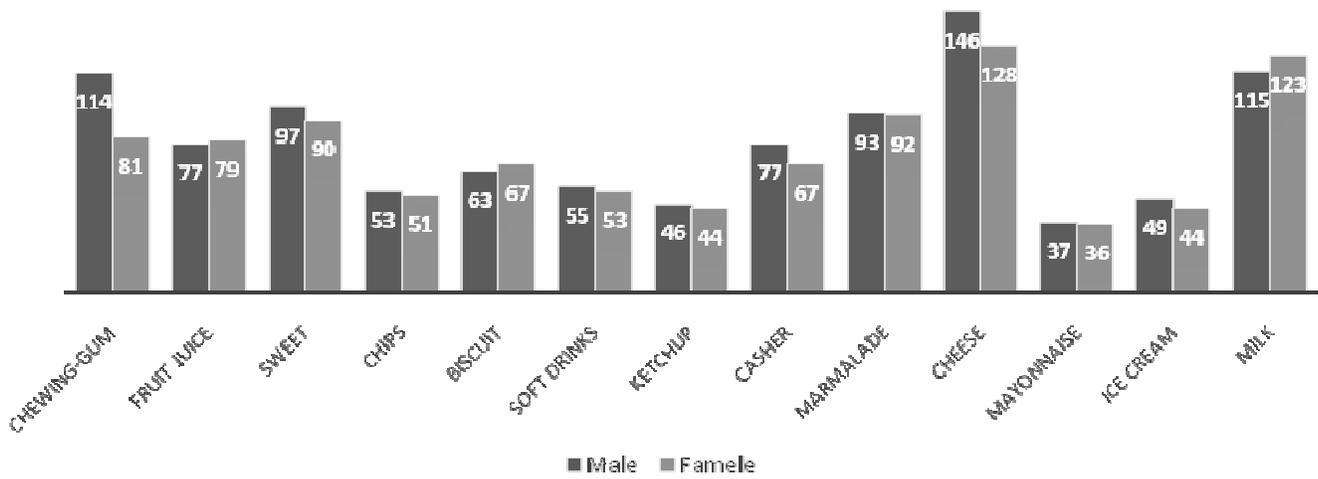


Figure 3: Distribution of the daily food products consumption by gender.

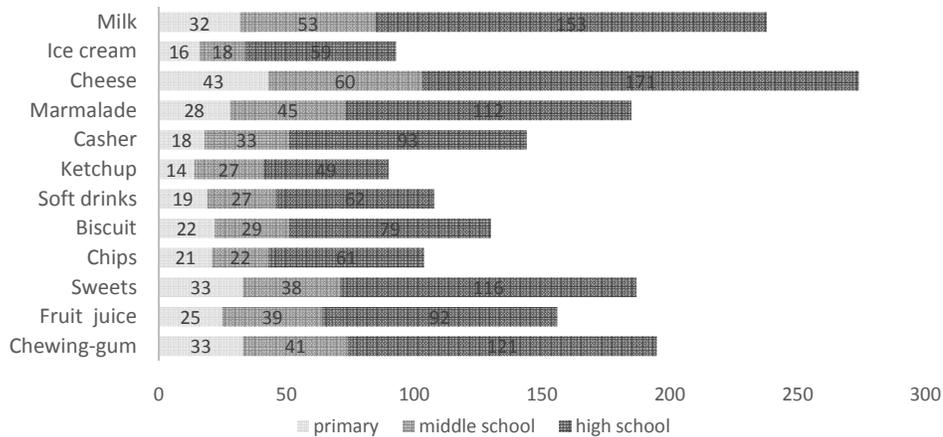
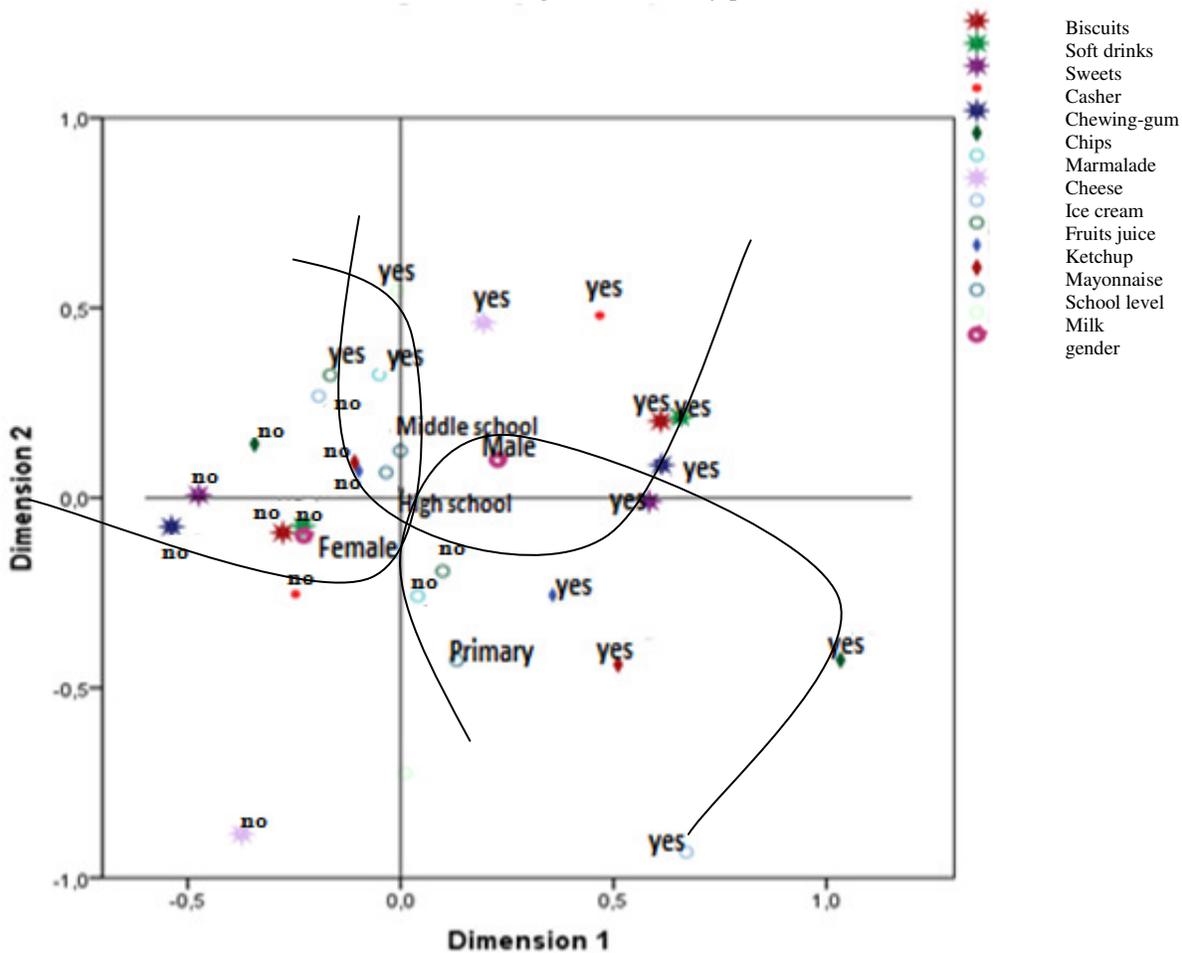


Figure 4: Distribution of students answering "yes" for daily food products consumption by school level.

Attached diagram of modality points



Standardization of the main variable

Figure 5: Graphic of the daily food products consumption by gender and school level

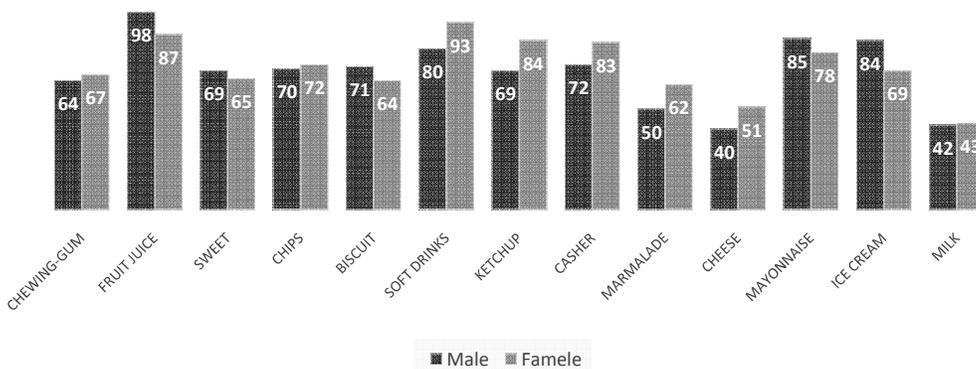
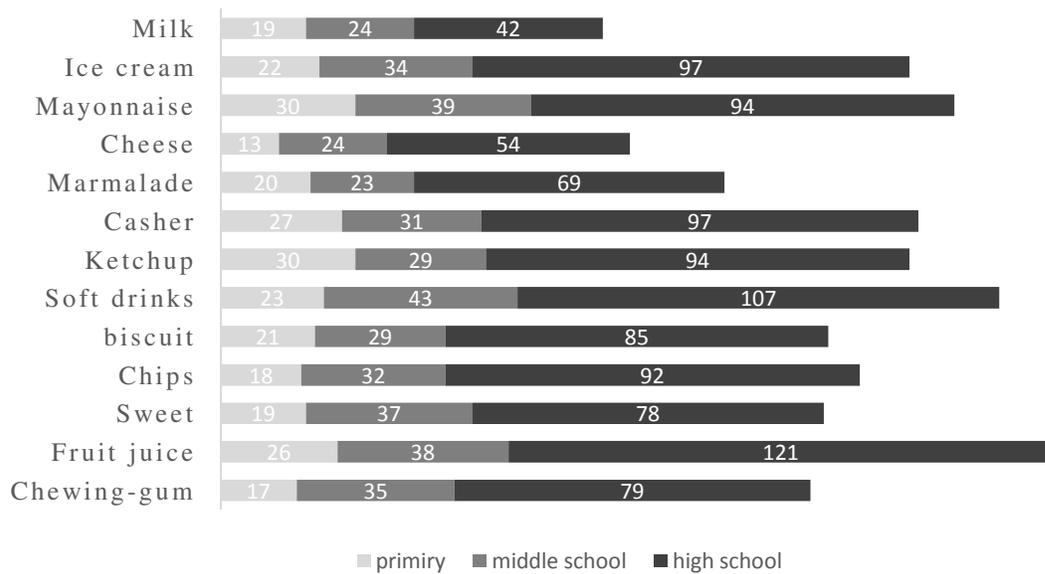


Figure 6: Distribution of the weekly food products consumption by gender



**Figure7:** Distribution of students answering "yes" for weekly food products consumption by school level.

chewing gum, soft drinks, sweets, cheese, cookies and casher.

- The second group of primary school students preferentially eats the following foods: chips, ketchup, mayonnaise and ice cream.

- The third group of girls at middle and high school consumes more fruit juices, marmalade. It also consumes more the milky products than boys.

### Weekly food products consumption

#### Weekly food products consumption by males and females

The Figure 6 shows the weekly food products consumption by gender.

#### Weekly food products consumption by school level.

The figure 7 shows the weekly consumption of food products by the students of the three grades. The analysis of this graph shows that some foods are greatly consumed by students every week such as the fruit juice (44%), soft drinks (41%), mayonnaise (39%) and ice cream (39%).

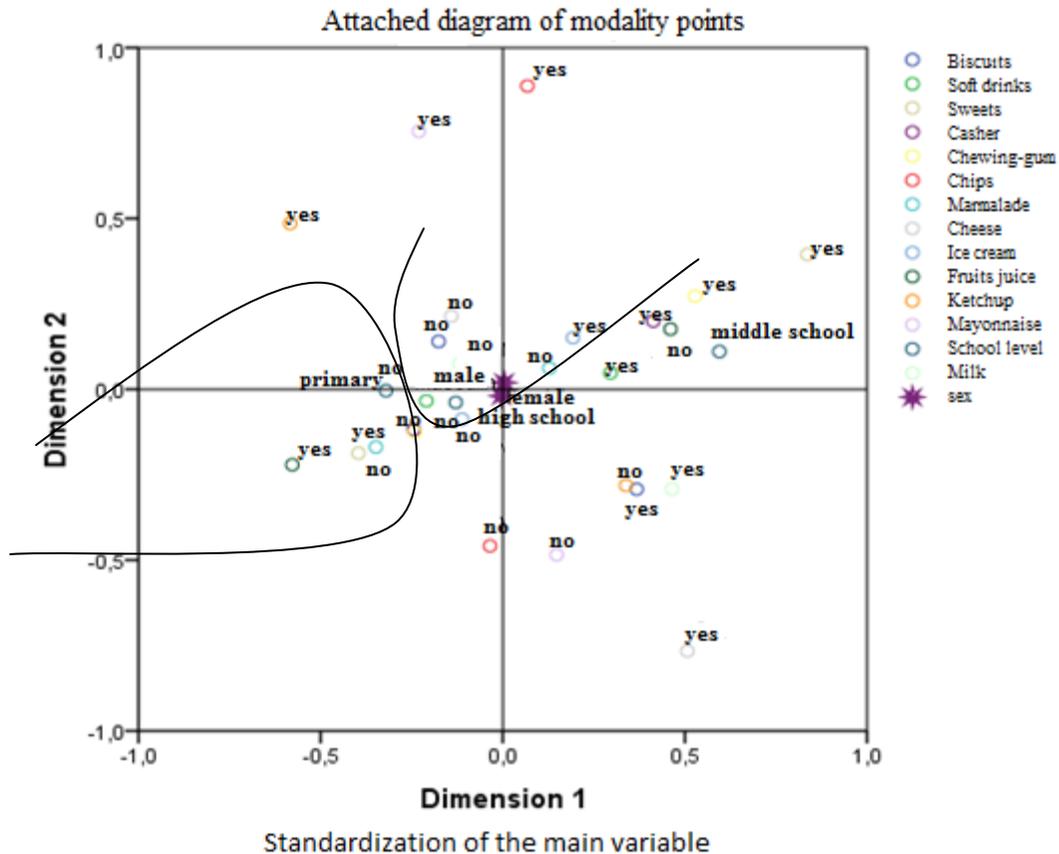
#### The result of MCA for weekly food consumption

The overall analysis of the weekly foodstuffs consumption by gender and school level is shown in Figure 8.

The Multiple Correspondence Analysis (MCA) of the weekly food consumption allowed classifying students to two distinct groups (fig.8). The first group consisted of middle school students whom weekly consume the following products: sweet, casher, chewing gum, fruit juice and ice-cream. The second group included high school and primary school students who slightly consume mentioned foodstuffs, weekly.

### DISCUSSION

The daily and weekly consumption frequency displays no significant difference at 5% error ( $p > 0, 05$ ). Regarding the daily consumption, the frequency of consumed products among gender is in the order: 37, 9% for females and 35, 1% for males. The situation is the inverse for the weekly consumption; the frequency appears significantly different ( $p < 0, 05$ ). It is 20, 4% for males and 17% for females. In parallel, 22, 6% (12% for females and 10% for males) of a surveyed student answered "no" to foodstuffs consumption. Data of the Chi-Square test of independence suggest that the daily consumption mode of products is not perceptible between boys and girls, except for chewing-gum (chi-square = 10,79 at  $p = 0,001$ ) and cheese (chi-square = 3,70 at  $p = 0,05$ ); for boys (27, 34%) and for girls (19, 42%). As well for cheese, the consumption by boys is more important (35%) than girls 30% (3). Mayonnaise, ketchup and ice cream are less daily consumed by students. The analysis of « school level » variety shows no significant difference. Therefore, the average of



**Figure 8:** Representation of the weekly food products consumption by gender and school level.

consumed foodstuffs per day/ school level is 4,  $74 \pm 2, 05$ . The results of the statistical analysis showed that cheese consumption occupies the first choice among students in three school levels with 65, 71%, followed by milk (57, 07%). Then, sweets and chewing-gums came with mostly the same consumption rate: (44, 84%) and (44,93%), respectively. This important consumption of the last two products was reported by some researchers with their negative impact on the health of consumers [5]. Whereas, ketchup (21, 58%), ice cream (22, 30%) and chips (25%) are daily less consumed. The results of the daily products consumption (low by primary school, medium by middle school and high by adolescent students) are the reverse according to another study [6]. The consumption of sweet (by children) is reasonable because it is necessary for their growth [8]. This may be explained by the physiological needs of the human body [9] because as a child grows, he needs more calories [10]. The distribution of students according to weekly consumption of industrially processed foods is shown in Figure 6. Through the investigation, we have found out that the most consumed products are: fruit juices, drinks,

ketchup, casher, mayonnaise, and ice cream. Among 417 surveyed students 45,5 % of boys intensively eat every week the following products: fruit juice, sweets, cookies, mayonnaise and ice cream. 47,9 % of girls consume more soft drinks, ketchup, casher, chewing-gum, marmalade and cheese. Concerning milk consumption, only 10% of boys and 10% of girls answered "yes". But, the rest of the food consumption is almost the same among boys and girls (fig.6). The weekly consumption of juice varies among the three groups of students. Indeed; 25% of primary students drink fruit juice every week, 41% of middle school students and finally 47% of high school students. Hence, there is a positive correlation between students' age and consumption of fruit juice. For the consumption of soft drinks, 37% of high school students consume less soft drink than middle school students (47%). The consumption of ice cream and mayonnaise was respectively remarked with high percentage (37%) and (36%) among high school students compared with other school levels.

## CONCLUSION

Based on the results of the survey of foodstuffs consumption by primary, college and high school students, boys and girls are equal in the daily consumption which indicates that the risk of exposure to food additives is more important among boys as well as girls [11, 12]. The most consumed packaged products per day for boys are: cheese, milk and chewing-gum. But, the girls are more admired by milk and cheese. For the weekly mode, boys consume more fruit juices; however, girls prefer soft drinks. Mayonnaise, ketchup, chips and ice cream was consumed less often by day; but cheese and milk were the top choices; 65,71% for cheese, followed by milk 57,07%. For daily and weekly consumption depending on school level, high school students consume more food products than college school and primary school students.

## ACKNOWLEDGEMENTS

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*Full Length Research*

# **Beliefs and Practice of Breast Cancer Detection and Prevention: The Health Implication**

**Okpako J.E.F. (Ph.D) and Ikemike D. O (BSc, M.ed, Ph.D in view)**

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The purpose of the study was to investigate the Beliefs and Practice of breast cancer detection and prevention, among female secondary school teachers in Bayelsa State. The research design was a cross sectional survey. Nine hundred and seventy six (976), female teachers in Bayelsa State were sampled, using multistage sampling procedures. The research instrument was a self- structured and validated questionnaire with reliability coefficient of 0.78 using the person product moment correlation. The statistical tools used for the analysis of the data were descriptive statistics of percentage, mean and inferential statistics of chi-square and one- way ANOVA using the Statistical Package for Social Sciences (SPSS) batch system. Results showed that majority of the female teachers ( $\bar{x} = 3.15$ ) had right beliefs about breast cancer detection and prevention but the practice of breast cancer detective and preventive measures were below average (35.6%). Also the result showed that demographic variables such as religion, marital status and location had no significant influence on practice of breast cancer detection and prevention. Likewise location has significant influence on beliefs about breast cancer detection and prevention. It was recommended that; health education campaigns should be carried out to enlightened the public especially teachers on the importance of putting into practice the detective and preventive measures of breast cancer, because having right beliefs about something is important but putting it into practice will yield a better result. State government should sponsor and organize workshops/ seminars on the importance of putting in to practice the detective and preventive measures of breast cancer, among women in general. There is urgent need to design more interventions and also to implement and re-enforce existing cancer awareness and cancer screening programmes.

**Keywords:** Beliefs, Practice, Breast cancer, Detection and Prevention, Health Implication

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## **INTRODUCTION**

### **Background**

Breast cancer is now the leading cancer in Nigerian women with a rising prevalence of 33.6/100,000 to 116/100.000. Increased number of prominent Nigerian women had died from the disease. Breast cancer is usually diagnosed in late stages in countries with limited resources. Early detection of Breast Cancer is likely to

improve the outcome of the disease for women in these areas.(Heba, Mamdouh, Hazzem, & Omnia,2014). Reduction in mortality from Breast Cancer depends to a large extent on interventions aimed at early detection and treatment, including breast self-examination, clinical breast examination, and mammography.(Sadler, Dhanjal, Shah, Ko & Anghel,2001) Lack of early detection programs is the primary reason for the escalation of the

mortality rate from Breast Cancer in developing countries.( Pinotti , Barros , Hegg, Zeferino, 1995).

Over the years, people had the belief that breast cancer is an older women's disease, therefore, the primary focus has been on prevention, detection and treatment of breast cancer for women who are 50 years and above (Kinnon, 2003). But in the African- American community, the disease can strike well at a younger age and this prompted physicians and cancer advocates groups to recommend that women should get baseline mammograms at age 40 (American Cancer Society, 2012).

Breast cancer is usually diagnosed in late stages in countries with limited resources (Marchick, Henson, 2005). Efforts aimed at detecting it in the earlier stages are likely to improve the outcome of the disease for women in these areas.( Anderson ,Smith, Meischke, Bowen, &Urban,2003). Globally, efforts to increase screening have met with moderate success (Althuis, Dozier, Anderson, Devesa, Brinton, 2005). The Breast Health Global Initiative recommends that women aged 50-69 should have mammographic screening every 2 years even in countries with limited resources (Yip& Anderson, 2007)

One of the vital parts of the body affected by cancer is the breast, giving rise to breast cancer. Cancer is a non-communicable disease, increasingly becoming important worldwide. It is a disease characterized by an abnormal growth of cells with the ability to invade adjacent tissues and even metastasize to distant organs, resulting in morbidity and eventually leading to the death of the individual, if not detected and managed early (Park, 2007). Over the past two decades, breast cancer has become a matter of serious public health concern in developing countries and associated mortality, especially among women. It is established that early detection and early treatment lead to improved survival (World Health Organization, 2007).

Cancer occurs as a result of mutations, or abnormal changes, in the genes responsible for regulating the growth of cells and keeping them healthy. Breast cancer is a malignant tumor that starts in the breast tissue, which is made up of glands for milk production. A malignant tumor is a group of cancer cells that can grow in to surrounding tissues (invade) or spread (metastasize) to distant areas of the body. Most breast cancers begin in the cells that line the ducts, which are the passages that drain milk from the lobules to the nipple, (ductal cancers). Some begin in the cells that line the lobules, which are the milk producing glands (lobular cancers), while a small number start in other tissues. Thus most types of cancer are named after the part of the body where the tumor originates. The disease occurs almost entirely in women, but men can get it, too (Puangthong, 2006).Breast cancer presents most commonly as a painless breast lump and a smaller proportion with non- lump symptoms. In those

with spread of the disease, there may be bone pain, swollen lymph nodes, shortness of breast (Saunders, Jassal, 2009).

Every woman is at risk of developing breast cancer. There are diverse risk factors that may affect each woman's susceptibility to the disease which include: increasing age, hormone replacement therapy (HRT), high dietary fat, excessive alcohol consumption smoking, exposure to certain chemicals, physical agents such as radiation, obesity, having children at late age or not at all, and family history, onset of early menstrual period among others, (Globocan, 2000, & American Cancer Society, 2009).

Breast cancer is a disease of public health importance. Female malignancies such as breast cancer are an important aspect of the reproductive health problems of women worldwide. Breast cancer affects young, middle-aged, and elderly women who are care givers of the family and who contribute to the development of society. Breast cancer is unfortunately still characterized by late presentation and poor outcome in many developing countries that lack the facility for early detection. It results in high morbidity and mortality in women worldwide. The high morbidity and mortality from breast cancer can be decreased by measures targeted at early detection such as screening. Breast examination as screening tool for breast cancer in developing countries is advocated in view of its cost- effectiveness (Misauno, Anosike, Ojo& Ismaila, 2011). It is surprising, however, that cancer of the breast still results in high morbidity and mortality despite the fact that the breast is an "exposed" organ and is readily accessible to breast screening measures (Herman, Gill &Fajardo, 2002).

According to Adekemi, Adenike, and Abimbola (2012) breast screening refers to tests and examinations used to detect a disease such as cancer in people, who do not have any symptoms. Since the degree of success in treating breast cancer is influenced primarily by the stage at which intervention is introduced, secondary prevention (early detection) is the mainstay. Philip, Harris, Flaherty and Joslin (1986), outlined the three screening methods recommended for breast cancer which include breast self-examination (BSE), clinical breast examination (CBE) and mammography.

Mammography is the only screening tool proven to reduce Breast Cancer mortality, with evidence that adherence to yearly screening mammography can reduce Breast Cancer mortality by 22-35% for women aged 50 years or older ( Greif, 2010 ). Mammography is an x-ray of the breast that is complex and expensive, but may pick up tumours long before they can be detected in any other way, thus enhancing better prognosis than those whose cancer is detected in some other way, (Aldridge, 2005). While recognized as the most effective screening procedures for early detection, this technique is also the most expensive. Because of this, efforts have

been made, particularly in the United States, to make the procedure more affordable (Parker, Simpson & McCooley, 1995). The United States Preventive Services Task Force recommended that at 50 to 70 years old women should have a screening mammogram every two years, while at 40 to 49 years old, women should start thinking of getting a mammogram (Centre for Disease Control and Prevention, 2014).

Clinical breast examination is an examination of your breast by a health professional such as a doctor or nurse, who use his or her hand to feel for lumps or other changes in the breast that may mean a serious problem is present, such as breast cancer (American Cancer Society, 2015). Clinical breast examination is also relatively simple and inexpensive, but its effectiveness in reducing mortality from breast cancer has not been directly tested in a randomized trial, (Aldridge, 2005).

Breast self – examination (BSE) is the examination performed by individuals to help detect any abnormality within the breasts. It involves visually and manually inspecting the breast for lumps and changes in the skin and nipples of the breasts. It should be performed monthly after the age of 20 years; preferably a few days after an individual's menstrual period when the breasts are least swollen. BSE entails a process whereby women examine their breasts regularly to detect any abnormal swelling or lumps in the breast in order to seek prompt medical attention. BSE is a useful tool for the early detection of breast cancer. This is very important because prognosis is directly associated with the stage at which the tumour is detected and how localized the lesion is. Early diagnosis usually results in treatment before metastasis of the cancerous cells and signifies a better outcome of management. It has been estimated that an effective screening programme may reduce mortality in the screening age group by up to 25% (Blamey, Wilson & Patrick, 2000).

According to Talbert (2008), there is cancer fatalism which is the belief that all things in the world are under the control of some invisible forces, and we are powerless to do anything about it. Hence the belief that situations such as illnesses or catastrophic events, happen because of a higher power (such as God), or they are just meant to happen, and cannot be avoided. Thus the belief that death is inevitable when cancer is present has also been identified as a barrier to participation in cancer screening, detection and prevention (Powe, 1997). In the view of Knight (2003), holds that all events in the history of the world, and in particular, the actions and incidents which make up the story of each individual life are determined by fate. Though Ali, Mehregan and Soghra (2003) study findings suggests that most Muslim women do not perceive breast self- examination as being against their Islamic beliefs and that they believe clinical breast examination by a male physician does not interfere with their religious

beliefs. Opoku, Benwell and Yarney (2012) also examined the influence of contextual factors such as cultural beliefs and health system characteristics on intention to screen for breast cancer among Ghanaian women. It was found that women's perception of the benefits of breast screening was related to their intentions to perform BSE or have CBE or mammography. Women who knew that early detection through screening could reduce their chances of dying from breast cancer reported positive intention towards screening.

The current guidelines from the American Cancer Society, (1996), states that women 20 years and older should practice monthly breast self-examination (BSE). Women 20-39 years old should have a clinical breast examination, (CBE) every three years, while women 40 years and older should have a yearly CBE. Women 40-49 years old should also have a mammogram every 1-2 years, and women 50 years and older should have one yearly. This is not only a state of physical wellbeing, but is an expression of the many roles she performs as a mother, caregiver, wage earner and her interaction with the social and economic, as well as cultural circumstances which influence her duty life (Aswathy, Sumithra, Valsala, Sandheed, Lohidas, Shobha, George, Francis, Rajeew, & Johnson, 2006). The American Cancer Society (2002), posits that if we can effectively promote healthy behaviours, much of the suffering and death from cancer can be prevented or reduced. However, poor practice of breast cancer screening methods has been reported in many studies in Nigeria, (Akhigbe & Omuemu, 2009).

## AREA OF STUDY

Bayelsa State is one of the 36 political sub-divisions of Nigeria. It occupies the extreme south of the country and is approximately mid-way between the eastern and western boundaries of the country with the Republic of Cameroon and Benin respectively. The state is bounded in the north by Delta State, east by Rivers State and the west and south by the Gulf of Guinea. Bayelsa State is a picturesque tropical rain forest, with an area of about 21,110 square kilometres. More than three quarters of this area is covered by water, with a moderately low land stretching from Ekeremor to Nembe (Yanga, 2006). It has a population of around 2 million people, (National Population Commission, 2006).

## STATEMENT OF THE PROBLEM

Cancer had claimed the lives of so many notable female Nigerians, Bayelsa State inclusive. Could it be that the increasing cases of breast cancer in females, is due to

wrong beliefs about breast cancer, or not being able to practice measures for early detection and prevention? Teachers remain key persons that can play an effective role in communication and motivation of young students, and can help to disseminate the importance of screening for breast cancer can as well serve as role models to other women in the society. Interestingly, there are current data suggesting that healthy behaviour towards breast cancer detection and prevention may be influenced by having the right beliefs about breast cancer.

### AIM AND OBJECTIVES OF THE STUDY

The aim of this study was to assess the beliefs and practice of breast cancer detection and prevention and the health implication among female teachers of government-owned secondary schools in Bayelsa State. In specific terms, the study intends to determine the:

1. Beliefs about breast cancer detection and prevention among female teachers of government-owned secondary schools in Bayelsa State.
2. Practice of breast cancer detection and prevention among female teachers of government-owned secondary schools in Bayelsa State.
3. Influence of religion on the practice of breast cancer detection and prevention among female teachers of government-owned secondary schools in Bayelsa State.
4. Influence of marital status, on the beliefs and practice of breast cancer detection and prevention among female teachers of government-owned secondary schools in Bayesa State.
5. Influence of location on the practice of breast cancer detection and prevention among female teachers of government-owned secondary schools in Bayelsa State.

### RESEARCH QUESTIONS

The following research questions guided the study

1. What are the beliefs about breast cancer detection and prevention among female teachers in government-owned secondary schools in Bayelsa State?
2. What is the practice of breast cancer detection and prevention among female teachers in government-owned secondary schools in Bayelsa State?
3. What is influence of religion on the practice of breast cancer detection and prevention among female teachers in government-owned secondary schools in Bayelsa State?

4. Does marital status, have influence on the Beliefs and Practice of breast cancer detection and prevention among female teachers in government-owned secondary schools in Bayelsa state?
5. Does location have influence on the Practice of breast Cancer detection and prevention among female teachers in government- owned secondary schools in Bayelsa State?

### Hypotheses

The following hypotheses were postulated and tested at .05 alpha level.

1. Religion has no significant influence on the practice of breast cancer detection and prevention among female teachers in government-owned secondary schools in Bayelsa State.
2. Marital status has no significant influence on the beliefs about breast cancer detection and prevention among female teachers in government- owned secondary schools in Bayelsa State.
3. Marital status has no significant influence on the practice of breast cancer detection and prevention among female teachers in government- owned secondary schools in Bayelsa State.
4. Location has no significant influence on the practice of breast cancer detection and prevention among female teachers in government-owned secondary schools in Bayelsa State.

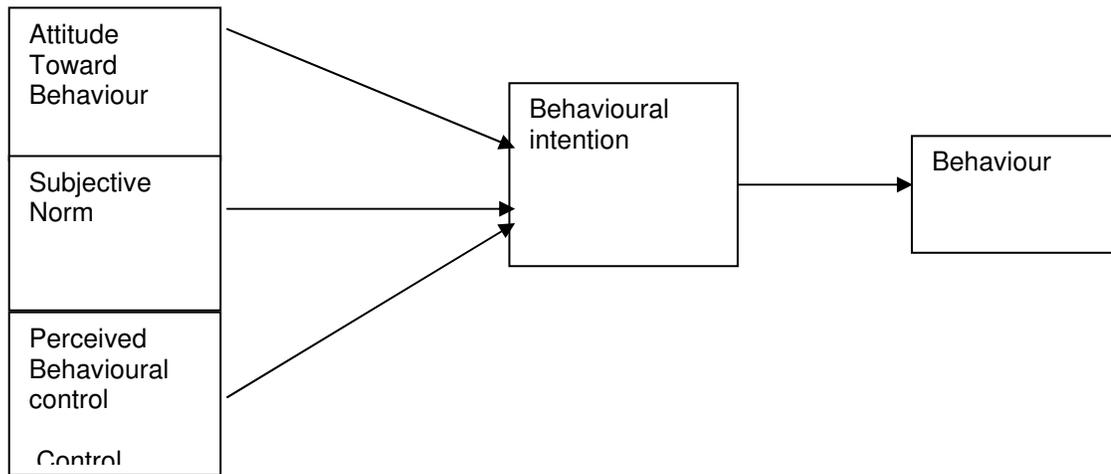
### THEORETICAL FRAMEWORK

- i Health Belief Model (Hockbaum, Leventhal, Kegeles & Rose Stock, 1966)
- ii Theory of Planned Behaviour (Ajzen, 1991)
- iii Theory of Reason Action (Fishbein & Ajzen, 1975)

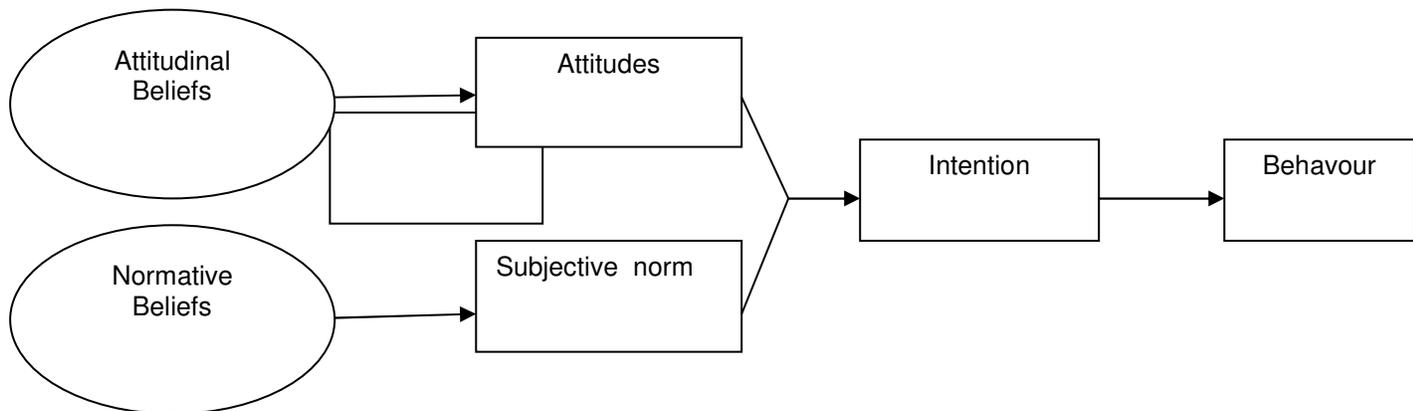
A possible framework utilized to help understand why and under what conditions people take action to prevent, detect or comply with treatment is the Health Belief Model. The HBM includes the following four concepts:

1. Perceived personal exposure to a health condition (susceptibility).
2. Perceived personal harm from the condition (seriousness).
3. Perceived positive attributes of an action (benefits) and
4. Perceived negative aspects related to an action (barriers).

According to Abdulaziz and Parinnaz (2012), the Health Belief Model (HBM), is a Psychological model that



**Figure 1:** Theory of Planned Behaviour. Source: Ajzen, (1991).



**Figure 2:** Theory of Reasoned Action . Source: Ajen&Fisfbein, (1999).

attempts to explain and predict preventive health behaviours.

Theory of Reasoned Action: This construct reflects an individual’s desire to have the cancer detected early and beliefs that a screening behavior will lead to early detection of cancer. Subjective norms reflect the social pressure an individual feels to be screened for cancer. This pressure arises from the perceived expectations from others such a family, friends, and colleagues who may encourage or discourage cancer screening, and an individual’s desire to comply with these expectations. Perceived behavioural control; similar to self-efficacy, reflects the individual’s belief in his or her ability to perform the cancer screening behaviour in the presence of constructive or obstructive factors,(Glanz, Rimer, & Lewis, 2002). See Figure 1

**The Theory of Reasoned Action (TRA)**

The Theory of Reasoned Action (TRA) by Ajzen and

Fishbein (1999), postulates of behaviour. Intentions are formulated via a reasoned process whereby the individual considers the consequences of their actions, either implicitly or explicitly. The behaviour reasoned to be the most likely to achieve the most positive outcome for the individual is the enacted. The TRA hypothesizes two determinants of interventions: attitudes and subjective norms which are underpinned by attitudinal and normative beliefs about the consequences of the behaviour. The strength of a person’s attitude (i.e, their positive or negative evaluation of performing the behaviour) combined with the weight of social pressure they perceived, they are under to perform the behaviour (subjective norm), will influence the strength of their intention to perform the behaviour and the subjective action. The diagram is shown in Figure 2.

**METHOD AND MATERIALS**

A cross sectional survey design was adopted for the

**Table 1:** Frequency and percentage distribution of respondents by Age

Age	f	%
20- 24 years	178	21.1
25-29 years	203	24.0
30-34 years	180	21.3
35-39 years	137	16.2
40 years and above	147	17.4
Total	845	100

**Table 2:** Frequency and percentage distribution of respondents by Educational Status

S/N	Educational Status	f	%
1.	NCE	219	25.9
2.	B.Ed/ B.Sc	560	66.3
3.	M.Ed/M.Sc	62	7.3
4.	Ph.D	4	0.5
	<b>Total</b>	<b>845</b>	<b>100</b>

**Table 3:** Frequency and percentage distribution of respondents by Marital Status

Marital Status	f	%
Unmarried	420	49.7
Married	401	47.5
Divorce	14	1.7
Separated	7	0.8
Widowed	3	0.4
<b>Total</b>	<b>845</b>	<b>100</b>

study. The population of the study consists of 1,952 female teachers of government –owned secondary schools in Bayelsa State, with a sample size of 976 female teachers. All the eight local government areas within the three senatorial districts were used for the study. Multi-stage sampling procedures were used to draw the sample. The research instrument for data collection was a 29 item self- structured and validated questionnaire with reliability coefficient of 0.78, using the person product moment correlation. The statistical tools used for the analysis of the data include descriptive statistics of percentage, mean and inferential statistics of chi-square, and one-way ANOVA using the statistical package for social sciences (SPSS) batch system. A total of 976 copies of questionnaire were administered directly to the respondents with the help of 10 research assistants. Eight hundred and forty five (845) copies were properly filled and returned, giving a return rate of 87 percent and was used for the analysis.

## RESULTS

Table 1 shows that 178 (21.1%) of the female teachers were between the ages of 20-24 years, while 203 (24%)

of them were between the ages of 25-29 years. Also 180 (21.3%), were between the ages of 30-34 years, 137 (16.2%) of the teachers were between the ages of 35-39 years and, 147 (17.4%) of them were 40 years and above. This indicated that teachers within the age bracket of 25–29 years constituted the highest number 203 (24%).

Table 2 shows that 219 (25.9%) of teachers were NCE holder, while B.Ed/ B.Sc holders were 560 (66.3%). Also teachers that were holders of M.Ed/M.Sc were 62 (7.3%) and Ph.D, 4 (0.5%) which indicated that the highest number of teachers, 560 (66.3%) were B.Ed/B.Sc holders.

Table 3 shows that 420 (49.7%) of the female teachers were unmarried, 401 (47.5%) of them were married, while 14 (1.7%) were divorced teachers, while 7 (0.8%) were separated. Also 3 (0.4%) of teachers were widowed, which indicated that the highest number of teachers were those that were unmarried 420 (49.7%).

Table 4 shows that 819 (96.9%) of teachers were Christians, 17 (2.0%), of them were Islam, while teacher that belong to Traditional religion were 5 (0.6%) and others, (Eckankar and Grail Message) 4 (0.5%), which indicated that the highest number of teachers 819 (96.9%) were Christians.

**Table 4:** Frequency and percentage distribution of respondents by Religion

S/N	Religious Status	f	%
1.	Christianity	819	96.9
2.	Islam	17	2.0
3.	Traditional religion	5	0.6
4.	Others (ECKists & Grail-Message)	4	0.5
	<b>Total</b>	<b>845</b>	<b>100</b>

**Table 5:** Frequency and percentage distribution of respondents by Location

S/N	Location	f	%
1.	Urban	503	59.5
2.	Rural	342	40.5
	<b>Total</b>	<b>845</b>	<b>100</b>

Table 5 shows that 503 (59.5%) of female teachers from government-owned secondary school resided in the urban area, while 342 (40.5%) resided in the rural area of Bayelsa State.

**Research Question 1:** What is the belief about breast cancer detection and prevention among female teachers of government-owned secondary schools in Bayelsa State?

Table 6 shows that the female teachers have right beliefs about breast cancer detection and prevention with regards to; breast cannot be detected by breast self-examination with ( $\bar{x} = 2.72$ ); Clinical breast examination by a male physician is embarrassing ( $\bar{x} = 2.82$ ). Likewise feeling or touching one's breast for lump by a physician is disgraceful ( $\bar{x} = 2.98$ ), and Clinical breast examination by a male physician is against my religious belief ( $\bar{x} = 3.10$ ). Also with regards to mammography is not a useful method for breast cancer detection ( $\bar{x} = 3.10$ ). Breast cancer cannot be prevented ( $\bar{x} = 3.14$ ), breast cancer is a disease that can be prevented once the person has faith ( $\bar{x} = 3.03$ ); breast cancer is punishment from God and so cannot be prevented ( $\bar{x} = 3.50$ ); breast cancer is due to bad luck and cannot be prevented ( $\bar{x} = 3.66$ ); breast cancer is a matter of destiny and there is no need to worry about its prevention ( $\bar{x} = 3.64$ ); breast cancer can be prevented by avoiding hand shake with someone having the disease ( $\bar{x} = 3.46$ ); breast cancer is not curable but preventable ( $\bar{x} = 2.81$ ); one's diet has relationship with breast cancer prevention ( $\bar{x} = 2.83$ ); breast cancer is caused by witches and wizards which can not be prevented ( $\bar{x} = 3.42$ ); breast cancer patients should be stigmatized as a way of preventing its occurrence and spread ( $\bar{x} = 3.19$ ) and that there is nothing like breast cancer talkless of its prevention ( $\bar{x} = 3.12$ ). It was found that the respondents had right beliefs about

breast cancer detection and prevention, with the overall grand mean of 3.15, which is also in line with medical practice.

**Research Question 2:** What is the practice of breast cancer detection and prevention among female teachers of government-owned secondary schools in Bayelsa State?

Table 7: reveals that 531 (62.8%) of the respondents did not perform breast self-examination, a week after menstrual cycle. Only 284 (33.6%) started breast self-examination at the age of 20 years, 407 (48.2) admitted that, they perform breast self-examination while standing in front of a mirror. Also 620 (73.4%) have not performed breast self-examination any time, and only 250 (29.6%) go for clinical breast examination during pregnancy and not for breast cancer examination, 414 (49.0%) also admitted that, they are satisfied in consulting a health professional in carrying out clinical breast examination. Likewise 192 (22.7%) started mammography at the age 40 years and only 143 (16.9%), go for mammography two times yearly as a routine for breast cancer detection. Meanwhile only 45 (5.33%) admitted that they abstain from smoking, 750 (88.8%) eat diet high in fat and 694 (82.1%) indulge in drinking alcohol beverages. Only 70 (8.30%) practice regular exercises to maintain healthy weight and 53 (6, 30%) did avoid radiation therapy. Based on the above findings, the practice of breast cancer detection and prevention among female teachers of government-owned secondary schools in Bayelsa State was poor with an overall percentage of 64.4%, against 35.6% of those that practice breast cancer detection and prevention.

**Research Question 3:** What is the influence of religion on the practice of breast cancer detection and prevention among female teachers of government-owned secondary

**Table 6:** Respondent's Beliefs about breast cancer detection and prevention: n=845

Statement	$\bar{x}$	Decision
<b>Breast cancer detection</b>		
1 Breast cancer cannot be detected by breast self-examination	2.72	Right belief
2 Clinical breast examination by a male physician is embarrassing	2.82	Right belief
3 Feeling or touching one's breast for lump by a physician is disgraceful	2.98	Right belief
4 Clinical breast examination by a male physician is against my religious belief	3.10	Right belief
5 Mammography is not a useful method for breast cancer detection	3.20	Right belief
Grand mean:	3.00	
<b>Breast Cancer Prevention</b>		
6 Breast cancer cannot be prevented	3.14	Right belief
7 Breast cancer is a disease that can be prevented once the person has faith	3.03	Right belief
8 Breast cancer is punishment from God and so cannot be prevented	3.50	Right belief
9 Breast cancer is due to bad luck and cannot be prevented	3.66	Right belief
10 Breast cancer is a matter of destiny and there is no need to worry about its prevention	3.64	Right belief
11 Breast cancer can be prevented by avoiding handshakes with someone having the disease	3.46	Right belief
12 Breast cancer is not curable but preventable	2.81	Right belief
13 One's diet has relationship with breast cancer prevention	2.83	Right belief
14 Breast cancer is caused by witches and wizards which cannot be prevented	3.42	Right belief
15 Breast cancer patients should be stigmatized as a way of preventing its occurrence and spread	3.19	Right belief
16 There is nothing like breast cancer, talk- less of its prevention	3.12	Right belief
<b>Grand mean</b>	<b>3.30</b>	<b>Right belief</b>
<b>Overall grand mean</b>	<b>3.15</b>	<b>Right belief</b>

schools in Bayelsa State?

Table 8: reveals that majority of the respondents in all the religious groups did not perform breast self-examination a week after menstrual cycle Christians;514(62.1%), Islam;10 (58.8%), Traditional religion; 4(80.0%) ECKists/ Grail Message; 3(75.0%). Also majority of the respondents in three religious groups did not start breast self-examination at the age of 20 years (Christians; 542 (66.2%), Islam=13 (76.5%), Traditional religion; 4(80.0%)), while 50% of

respondents in other religious groups (ECKists/ Grail Message) respectively, started breast self-examination at 20 years. With regards to performing breast self-examination, while standing in front of a mirror, Muslims 12(70.6%) responded positively, while the rest responded negatively, Christians; 425(51.9%), Traditionalreligion;4(80.0%) and ECKists/Grail Message; 4(100%). Furthermore majority of the respondents who are Christians; 609 (74.4%), Traditionalist; 5(100%) and ECKists/ Grail Message; 4(100%) never performed breast self-

examination at any time, whereas 10(58.8%) of them who are Muslims did perform breast self-examination at any time. Likewise 11(64.7%) of respondents who are Muslims did go for clinical breast examination only during pregnancy and not for breast cancer detection while the rest responded negatively Christians;582(71.1%), Traditionalists; 3(60.0%) and ECKists/ Grail Message; 4(100%).Majority of the respondents who are Christians; 423(51.6%), Traditionalists; 3(60.0%), and ECKists/Grail Message; 4(100%) admitted that they were not satisfied consulting a

**Table 7: Practice of Breast Cancer Detection and Prevention ( n=845)**

S/N		Statement			
Yes	No				
Breast Cancer Detection f%				f	
%					
1	I do perform breast self- examination a week after my menstrual Cycle	314	37.2		
	531 62.8				
2	I started breast self- examination at the age of 20 years	284	33.6		
3	561 66.4				
4	I perform breast self- examination while standing in front of a mirror	407	48.2	438	
	51.8				
5	I have not performed breast self- examination any time	225	26.6		
6	620 73.4				
7	I go for clinical breast examination only during pregnancy and not for BC examination	250	29.6	595	
	70.4				
8	I am satisfied consulting a health professional in carrying out clinical breast examination	414	49.0	431	
	51.0				
	I started mammography at the age of 40 years	192	22.7		
9	653 77.3				
10	I go for mammography two times yearly as a routine for breast cancer detection	143	16.9	702	
	83.1				
11	<b>Cluster</b>			<b>%</b>	
	<b>33.0 67.0</b>				
12	<b>Breast cancer Prevention</b>				
13	I abstain from smoking			45	
	5.33 800 94.7				
	I eat diet high in fat			750	
	88.8 95 11.2				
	I do regular exercise to maintain a healthy weight	70	8.30		
	775 91.7				
	I do drink alcohol beverages excessively			694	
	82.1 151 17.9				
	I do avoid radiation therapy			53	
	6.30 792 93.7				
	<b>Cluster</b>			<b>%</b>	
	<b>38.2 61.8</b>				
	<b>Overall</b>			<b>%</b>	
	<b>35.6 64.4</b>				

**Table 8:** Practice of breast cancer detection and prevention, based on religion ( n=845)**Table 8:** Practice of breast cancer detection and prevention, based on religion ( n=845)

S/N	Statement	Christianity (n=819)		Islam (n=17)		Trad-Rel (n=5)		ECK/GM (n=4)									
		Yes	%	No	%	Yes	%	No	%	Yes	%	No	%				
1.	I do perform self-examination a week after my menstrual cycle	305	(37.2)	514	(62.8)	7	(41.2)	10	(58.8)	1	(20.0)	4	(80.0)	1	(25.0)	3	(75.0)
2.	I started breast self-examination at the age of 20 years	277	(33.8)	542	(66.2)	4	(23.5)	13	(76.5)	1	(20.0)	4	(80.0)	2	(50.0)	2	(50.0)
3.	I perform breast self-examination while standing in front of a mirror	394	(48.1)	421	(51.9)	12	(70.6)	5	(29.4)	1	(20.0)	4	(80.0)	0	(0.00)	4	(100)
4.	I have not performed breast self-examination any time.	210	(25.6)	609	(74.4)	10	(58.8)	7	(41.2)	0	(0.00)	5	(100)	0	(00.0)	4	(100)
5.	I go for clinical breast examination only during pregnancy and not for BC examination	237	(28.9)	582	(71.1)	11	(64.7)	6	(35.3)	2	(40.0)	3	(60.0)	0	(0.00)	4	(100)
6.	I am satisfied consulting a health professional in carrying out clinical breast exam.	396	(48.4)	423	(51.6)	14	(82.4)	3	(17.6)	1	(20.0)	4	(80.0)	3	(75.0)	1	(25.0)
7.	I started mammography at the age 40 years.	188	(23.0)	631	(77.0)	3	(17.6)	14	(82.4)	1	(20.0)	4	(80.0)	0	(0.00)	4	(100)
8.	I go for mammography two times yearly as a routine for breast cancer detection	140	(17.1)	679	(82.9)	2	(11.8)	15	(88.2)	1	(20.0)	4	(80.0)	0	(0.00)	4	(100)
	Cluster %		32.8		67.2		46.3		53.7		20.0		80.0		18.8		81.2
	<b>Breast Cancer Prevention</b>																
9.	I abstain from smoking	39	(4.8)	780	(95.2)	5	(29.4)	12	(70.6)	1	(20.0)	4	(80.0)	0	(0.00)	4	(100)
10.	I eat diet high in fat	745	(91.0)	74	(9.0)	4	(23.5)	13	(76.5)	0	(0.00)	5	(100)	1	(25.0)	3	(75.0)
11.	I do regular exercise to maintain a healthy weight	66	(8.1)	753	(91.9)	2	(11.8)	15	(88.2)	2	(40.0)	3	(60.0)	0	(0.00)	4	(100)
12.	I do drink alcohol beverages excessively	689	(84.1)	130	(15.9)	3	(17.6)	14	(82.4)	1	(20.0)	4	(80.0)	1	(25.0)	3	(75.0)
13.	I do avoid radiation therapy	51	(6.2)	768	(93.8)	2	(11.8)	15	(88.2)	0	(0.00)	5	(100)	0	(0.00)	4	(100)
	Cluster %		38.8		61.2		18.8		81.2		16		84		10		90
	<b>Overall Cluster %</b>		35.8		64.2		32.6		67.4		18.0		82.0		14.4		85.6

health professional in carrying out clinical breast examination, while 11(64.7%) of respondents who are Muslims responded positively. Furthermore, the respondents in all the religious groups did not start mammography at the age of 40 years (Christianity; 631(77.0%), Islam; 14(82.4%), Traditionalists; 4(80.0%) and ECKists/Grail Message; 4(100%), likewise respondents in all the religious groups (Christians; 679(82.9%), Islam; 15(88.2) Traditionalists; 4(80.0%) and ECKists/ Grail Message; 4(100%), did not go for mammography two times yearly as a routine for breast cancer detection.

With regards to abstain from smoking, majority of the respondent in all the religious groups responded negatively, (Christianity; 679(69.5%), Islam; 12(70.6%), Traditionalists; 4(80.0%) and ECKists/ Grail Message; 4(100%). While majority of the respondents in all the religious groups did not eat diet high in fat, Islam ;13 (76.5%), Traditionalists; 5(100%) and ECKists/ Grail Message; 3(75.0%), except Christians; 745 (91.0%). Also majority of the respondents in all the religious groups did not carry out regular exercise to maintain a healthy weigh, Christians;753(91.9%).Islam;15(88.2%),Traditionalists;3( 60.0%)andEckists/GrailMessage;4(100%).Furthermore majority of the respondents in all the groups responded negatively to drinking alcohol beverages excessively, Islam ; 14 (82.4%), Traditionalists; 4 (80.0%), and ECKist/ Grail Message; 3 (75.0), except Christians; 689 (84.1%). While majority of respondents admitted that they did not avoid radiation therapy, (Christianity: 768 (93.8%), Islam; 15 (88.2%), Traditionalists; 5 (100%) and ECKists/ Grail Message; 4 (100%). From the analysis, it was revealed that the practice of breast cancer detection and prevention was poor amongst the various religious groups with the overall cluster percentages of negative responses (Christianity ; 64.2%, Islam ; 67.4%, Traditionalists ; 82.0% and ECKists / Grail Message;(85.6%).

**Research Question 4:** Does marital status have influence on practice of breast cancer detection and prevention among female teachers of government-owned secondary schools in Bayelsa State

Table 9 reveals that majority of the respondents with different marital status did not perform BSE a week after menstrual cycle, (unmarried; 272 (64.8%), married; 243 (60.0%), divorced; 9 (64.3%), separated; 6 (85.7%), and widowed; 3(100%). Also majority of the respondents did not start BSE at the age of 20 year, (unmarried; 286 (68.1%), married; 261 (65.1%), and widowed; 3(100%), while the rest of the respondents, widowed; 3 (100%), while the rest of the respondents, did practice BSE at the age of 20 years (divorced; 9 (64.3%), and separated; 6 (85.7%). Furthermore only the married teachers 217 (54.1%) performed BSE while standing in front of a

mirror, while majority of them did not, (Unmarried; 237 (56.4%), divorced; 9 (64.3%), separated; 6 (85.7%) and widowed; 2 (66.7%)

With respect to not performed BSE anytime, all the respondents with different marital status responded negatively (unmarried; 314 (74.8%), married; 284 (70.8%), divorced; 13 (92.9%), separated; 7 (100%) and widowed; 2 (66.7%). Also majority of the respondents with different marital status, responded negatively, to have gone for CBE only during pregnancy and not for breast cancer detection, (unmarried; 324 (77.1%), married; 260 (64.8%), divorced 9 (64.3%) and widowed; 3 (100%), while only the teachers that have separated; 5 (71.4%), that responded positively. Likewise majority of the respondents indicated dissatisfaction, consulting a health professional, in carrying out CBE (unmarried; 225 (53.6%), separated; 6 (85.7%) and widowed; 3 (100%), while the married; 207 (51.6%) and divorced; 8 (57.1%), indicated satisfaction. Furthermore majority of the respondents did not start mammography at the age of 40 years, (unmarried; 347 (82.6%), married; 289 (82.0%), divorced; 9 (64.3%) and separated; 7(100%) while only the widowed; 2 (66.75) responded positively. Also none of the respondents had gone for mammography two yearly as a routine for breast cancer detection (unmarried; 353(84.0%), married; 329 (82.0%), divorced; 11 (78.6%), separated; 6 (85.7%) and widowed; 3 (100%) All the respondents also responded negatively to abstinence from smoking (unmarried; 330 (78.6%), married; 280 (69.8%), divorced; 10 (71.4%), separated; 5 (71.4%) and widowed; 2 (66.7%). Likewise majority of the respondents eat diet high in fat, (unmarried; 260 (61.9%), married; 320 (79.8%), divorced; 11 (78.6%). Separated; 6 (85.7%) and widowed; 3 (100%).

With regards to performing regular exercise to maintain a healthy weight, all the respondents admitted positively, (unmarried; 290 (69.0%), married; 350 (87.3%), divorced; 12 (85.7%), separated; 5 (71.4%), and widowed; 3 (100%). They also responded positively to drinking alcohol beverages excessively (unmarried; 290 (69.0%), married; 350 (87.3%), divorced; 12 (85.7%), separated; 5 (71.4%) and widowed; 3 (100%). While all the respondents with different marital status responded negatively to avoiding radiation therapy (unmarried; 350 (83.3%), married; 251 (62.6%), divorced; 8 (57.1%), separated; 4 (57.1%), and widowed; 2 (66.7%), It was found that marital status does not have influence on the practice of breast cancer detection and prevention with the overall cluster percentages of 39.0% for Unmarried teachers, married; 49.1%, divorced 48.3%, separated; 37.5% and widowed; 41.7%.

**Research Question 5:** Does marital status have influence on beliefs about breast cancer detection and prevention among female teachers of government-owned secondary schools in Bayelsa State?

**Table 9:** Practice of breast cancer detection and prevention; Based on Marital Status (n= 845)

S/N	Statement	Unmarried (n= 420)		Married (n= 401)		Divorced (n= 14)		Separated(n= 7)		Widow(n= 3)											
		Yes		No		Yes		No		Yes		No									
		f	%	f	%	f	%	f	%	f	%	f	%								
<b>Breast Cancer Detection</b>																					
1.	I do perform BSE a week after my menstrual cycle	148	(33.6)	272	(64.8)	158	(39.4)	243	(60.0)	5	(35.7)	9	(64.3)	1	(14.3)	6	(85.7)	0	(0.00)	3	(100)
2.	I started BSE at the age of 20 Years	134	(32.0)	286	(68.1)	140	(43.9)	261	(65.1)	9	(64.3)	5	(35.7)	6	(85.7)	6	(85.7)	0	(0.00)	3	(100)
3.	I perform BSE while standing in front o of a mirror	183	(43.6)	237	(56.4)	217	(54.1)	184	(45.9)	5	(35.7)	9	(64.3)	1	(14.3)	6	(85.7)	1	(33.3)	2	(66.7)
4.	I have not performed BSE any time	106	(25.2)	314	(74.8)	117	(29.2)	284	(70.8)	1	(7.1)	13	(92.9)	0	(0.00)	7	(100)	1	(33.3)	2	(66.7)
5.	I go for CBE only during pregnancy and not for BC detection	96	(22.9)	324	(77.1)	141	(35.2)	260	(64.8)	5	(35.7)	9	(64.3)	5	(71.4)	2	(28.6)	0	(0.00)	3	(100)
6.	I am satisfied consulting a health professional, in carrying out CBE	195	(46.4)	225	(53.6)	207	(51.6)	194	(48.4)	8	(57.1)	6	(42.9)	1	(14.3)	6	(85.7)	0	(0.00)	3	(100)
7.	I started mammography at the age of 40 years	73	(17.4)	347	(82.6)	112	(27.9)	289	(82.0)	5	(35.7)	9	(64.3)	0	(0.00)	7	(100)	2	(66.7)	1	(33.3)
8.	I go for mammography two yearly as a routine for BC detection	67	(16.0)	353	(84.0)	72	(18.0)	329	(82.0)	3	(21.4)	11	(78.6)	1	(14.3)	6	(85.7)	0	(0.00)	3	(100)
<b>Cluster %</b>		<b>29.8</b>		<b>70.2</b>		<b>37.4</b>		<b>62.6</b>		<b>36.6</b>		<b>63.4</b>		<b>17.9</b>		<b>82.1</b>		<b>16.7</b>		<b>83.3</b>	
<b>Breast Cancer Prevention</b>																					
9.	I abstain from smoking	90	(21.4)	330	(78.6)	121	(30.2)	280	(69.8)	4	(28.6)	10	(71.4)	2	(28.6)	5	(71.4)	1	(33.3)	2	(66.7)
10.	I eat high diet in fat	260	(61.9)	160	(38.1)	320	(79.8)	81	(20.2)	11	(78.6)	3	(21.4)	6	(85.7)	1	(14.3)	3	(100)	0	(0.00)
11.	I do regular exercise to maintain a healthy weight	300	(71.4)	120	(28.6)	280	(69.8)	121	(30.2)	9	(64.3)	5	(35.7)	4	(57.1)	3	(42.9)	2	(66.7)	1	(33.3)
12.	I do drink alcohol beverages excessively	290	(69.0)	130	(31.0)	350	(87.3)	51	(12.7)	12	(85.7)	2	(14.3)	5	(71.4)	2	(28.6)	3	(100)	0	(0.00)
13.	I do avoid radiation	70	(16.7)	350	(83.3)	150	(37.4)	251	(62.6)	6	(42.9)	8	(57.1)	3	(42.9)	4	(57.1)	1	(33.3)	2	(66.7)
<b>Cluster %</b>		<b>48.1</b>		<b>51.9</b>		<b>60.9</b>		<b>39.1</b>		<b>60.0</b>		<b>40.0</b>		<b>57.1</b>		<b>42.9</b>		<b>66.7</b>		<b>33.4</b>	
<b>Overall Cluster %</b>		<b>39.0</b>		<b>61.0</b>		<b>49.2</b>		<b>50.8</b>		<b>48.3</b>		<b>51.7</b>		<b>37.5</b>		<b>62.5</b>		<b>41.7</b>		<b>58.3</b>	

**Table 10:** Beliefs about breast cancer detection and prevention, based on marital status (n=845)

S/N	Statement	Unmarried(n=420) $\bar{x}$ Decision	Married(n=401) $\bar{x}$ Decision	Divorced(n=14) $\bar{x}$ Decision	Separated (n=7) $\bar{x}$ Decision	Widowed(n=3) $\bar{x}$ Decision
1.	Breast cancer can not be detected by BSE	3.51 RB	3.62 RB	3.0 RB	3.0 RB	3.67 RB
2	CBE by a physician is embarrassing	3.24 RB	3.42 RB	3.14 RB	3.42 RB	3.33 RB
3.	Feeling or touching one's breast for lump, by a physician is disgraceful	3.12 RB	3.64 RB	3.64 RB	3.57 RB	2.14 WB
4	CBE by a male physician is against my religious belief	3.18 RB	3.32 RB	3.79 RB	3.00 RB	3.67 RB
5.	Mammography is not a useful tool for breast cancer detection	3.38 RB	3.67 RB	2.36 WB	3.57 RB	3.33 RB
	Grand Mean	3.29	3.53	3.19	3.31	3.23
	<b>Breast Cancer Prevention</b>					
6.	Breast cancer cannot be prevented	3.56 RB	3.45 RB	3.29 RB	3.29 RB	3.33 RB
7.	Breast cancer is a disease that can be prevented once the person has faith	3.45 RB	3.55 RB	3.21 RB	3.00 RB	3.00 RB
8.	Breast cancer is punishment from God and so cannot be prevented	3.77 RB	3.61 RB	3.50 RB	3.29 RB	3.67 RB
9.	Breast cancer is due to bad luck and can not be prevented	3.43 RB	3.82 RB	3.14 RB	3.43 RB	3.33 RB
10.	Breast cancer is a matter of destiny and there is no need for its prevention	3.51 RB	3.47 RB	3.36 RB	3.71 RB	3.66 RB
11.	Breast cancer can be prevented by avoiding hand shake with someone having the disease	3.47 RB	3.60 RB	3.42 RB	3.71 RB	2.67 RB
12.	Breast is not curable but Preventable	3.38 RB	3.67 RB	3.60 RB	3.71 RB	3.00 RB
13.	One's diet has relationship with breast cancer prevention	3.45 RB	3.50 RB	3.71 RB	3.29 RB	3.33 RB
14.	Breast cancer is caused by witches and wizards which cannot be prevented	3.52 RB	3.35 RB	3.60 RB	3.29 RB	3.33 RB
15.	Breast cancer pts should be stigmatized as a way of preventing its spread	3.67 RB	3.40 RB	3.57 RB	3.57 RB	3.00 RB
16.	There is nothing like breast cancer, talk less of its prevention	3.45 RB	3.69 RB	3.50 RB	3.00 RB	3.67 RB
	Grand Mean / Overall Grand Mean	3.83	3.60	3.44	3.10	3.27
	Overall Grand Mean	3.56	3.57	3.32	3.24	3.25

Table 10 reveals that the overall grand mean of female teachers who are unmarried ( $\bar{x}$  =3.56), married ( $\bar{x}$  =3.57) and divorced ( $\bar{x}$ =3.32) had right belief about breast cancer detection and prevention. Also, among the female teachers who are separated ( $\bar{x}$ = 3.24) and widowed ( $\bar{x}$  =3.27) had right belief about breast cancer detection and prevention. It was found that majority of the respondents with different marital status, had right

beliefs about breast cancer detection and prevention with an overall grand mean for unmarried teachers (3.56), married, (3.57), divorced, (3.32), separated, (3.24) and widowed, (3.25).

**Research Question 6:** Does location have influence on the practice of breast cancer detection and prevention among female teachers of government-owned secondary schools in

Bayelsa State?

Table 11 reveals that majority of the respondents living in the urban and rural areas 313 (62.25) and 220 (64.3%) respectively, did not practice breast self-examination a week after menstrual cycle. Also majority of the respondents did not start breast self-examination at the age of 20 years (urban; 337 (67.0%) and rural; 224

**Table 11:** Practice of breast cancer detection and prevention. Based on location (n=845).

S/N	Statement	Urban (n =503)		Rural ( n=342)					
		Yes	No	Yes	No				
Breast Cancer Detection		f	%	f	%				
1	I do perform self - examination a week after my menstrual cycle	190	37.8	313	62.2	122	35.7	220	64.3
2	I started breast self- examination at the age of 20 years	166	33.3	37	67.0	118	34.5	224	65.5
3	I perform breast self- examination while standing in front of a mirror	238	47.4	265	52.7	169	49.4	173	50.6
4	I have not performed breast self- examination any time	121	24.1	382	75.9	104	30.4	236	69.6
5	I go for CBE only during pregnancy and not for BC examination	154	30.6	349	69.4	96	28.1	246	71.9
6	I am satisfied consulting a health professional in carrying out CBE	244	48.5	259	51.5	170	49.7	172	50.3
7	I started mammography at the age 40 years	105	20.9	398	79.1	87	25.4	255	74.6
8	I go for mammography two times yearly as a routine for breast cancer detection.	81	16.1	422	83.9	62	18.1	280	81.9
	Cluster %	32.3	67.7	33.9	66.1				
<b>Breast Cancer Prevention</b>									
9.	I abstain from smoking	173	34.4	330	65.6	62	18.1	280	81.9
10.	I eat high diet in fat	420	83.5	83	16.5	291	85.1	51	14.9
11	I do regular exercise to maintain healthy weight	123	24.5	380	75.5	42	12.2	300	87.7
12	I do drink alcohol beverages excessively	385	76.5	118	23.5	285	83.3	57	16.7
13	I do avoid radiation therapy	144	28.6	359	71.4	27	7.9	315	92.1
	Cluster %	49.5	50.5	41.3	58.7				
	Overall Cluster %	40.9	59.1	37.6	62.4				

(65.5%). Likewise majority of the respondents did not perform BSE while standing in front of a mirror (urban; 265 (52.75) and rural; 173 (50.6%). Also majority of the teachers who lived in their various locations have not performed breast self-examination any time (urban; 382 (75.9%) and rural; 236 (69.6%). Likewise only few of the respondents did go for clinical breast examination only during pregnancy and not for breast cancer examination (urban; 154 (30.6%) and rural; 96 (28.1%).

Furthermore majority of the respondents admitted that they did not start mammography at the age of 40 years (urban; 259 (51.5%) and rural; 172 (50.3%). Also majority of the respondents did not go for mammography two times yearly as a routine as a routine for breast cancer

detection (urban; 422 (83.9%) and rural; 280 (81.9%). While 330 (65.6%) of female teachers from urban area and 280 (81.9%) from rural area admitted that they eat diet high in fat, and majority of the respondents from both locations did not perform regular exercise to maintain healthy weight (urban; 380 (75.5%) and rural; 300 (87.7%).

With regards to drinking alcohol beverages excessively, majority of the respondents (urban; 385 (76.5%) and rural; 285 (83.3%) responded positively. Also female teachers from urban area, 359 (71.4%) and rural area, 315 (92.1%) did not avoid radiation therapy. It was found that location does not influence practice of breast cancer detection and prevention, with the overall cluster

**Table 12:** Summary of chi-Square of no significant influence of religions on the practice of breast cancer detection and prevention.

$\chi^2$ calculated	$\chi^2$ critical	df	Alpha level	Decision
1.036	7.82	3	.05	Ho <sub>2</sub> , Retained

**Table 13:** Summary of one-way ANOVA of no significant influence of marital status on beliefs about breast cancer detection and prevention

	Sum of Squares	df	Mean square	F	F-crit.	Decision
Btw Group	301.890	4	60.378	1.314	2.37	Ho <sub>4</sub>
Within Group	retained					
Total	38566.434	840	45.967			
	38868.324	844				

**Table 14:** Summary of chi-Square of no significant influence of marital status on the practice of breast cancer detection and prevention

$\chi^2$ calculated	$\chi^2$ critical	df	Alpha Level	Decision
5.910 retained	9.49	4	.05	Ho <sub>5</sub>

percentages of negative responses for urban (59.1%) and rural (62.4%).

**Hypothesis 1:** Religion has no significant influence on practice of breast cancer detection and prevention among female secondary school teachers in Bayelsa State.

Table 12 reveals that the  $\chi^2$  calculated value (1.036) is less than the  $\chi^2$  critical value (7.82) at the degree of freedom (3) at .05 alpha level, hence the null hypothesis was accepted. Therefore, religions had no significant influence on practice of breast cancer detection and prevention among female secondary school teachers in Bayelsa State.

**Hypothesis 2:** Marital status has no significant influence on the beliefs about breast cancer detection and prevention among female teachers of government-owned secondary schools in Bayelsa State.

Table 13: reveals that the F- calculated value (1.314,) is less than the F- critical value (2.37) at the degree of freedom (4) at 0.05 alpha level hence the null hypothesis was accepted. Therefore, marital status had no significant influence on beliefs about breast cancer detection and prevention among female secondary

school teachers in Bayelsa State.

**Hypothesis 3:** Marital status has no significant influence on the practice of breast cancer detection and prevention among female teachers of government-owned secondary schools in Bayelsa State.

Table 14; reveals that the  $\chi^2$  calculated value (5.910) is less than the  $\chi^2$  critical value (9.49) at the degree of freedom(4) at 0.05 alpha level and since P- value (.315) is greater than 0.05, the null hypothesis was accepted. Hence, marital status had no significant influence on practice of breast cancer detection and prevention among female secondary school teachers in Bayelsa State.

**Hypothesis 4:** Location has no significant influence on the practice of breast cancer detection and prevention among female teachers of government-owned secondary schools in Bayelsa State.

Table 15reveals that the  $\chi^2$  calculated value (.563) is less than the  $\chi^2$  critical value (5.99) at degree of freedom (2) at 0.05 alpha level, hence the null hypothesis was retained. Hence, Location has no significant influence on practice of breast cancer detection and prevention among female secondary school teachers in Bayelsa State.

**Table 15:** Summary of chi-Square tests of influence of location on practice of breast cancer detection and prevention (Urban=503, Rural=342)

$\chi^2$ calculated	$\chi^2$ critical	df	Alpha Level	Decision
563	5.99	2	.05	Ho <sub>g</sub> retained

### SUMMARY OF MAJOR FINDINGS

1. The practice of breast cancer detection and prevention among urban and rural female secondary school teachers in Bayelsa State was poor, and there was no difference in their practice among the two groups.
2. Religion had no significant influence on practice of breast detection and prevention among female teachers of government-owned secondary schools in Bayelsa State.
3. Marital status had no significant influence on beliefs and practice of breast cancer detection and prevention among female teachers of government-owned secondary schools in Bayelsa State.
4. Location had no significant influence on the practice of breast cancer detection and prevention among female teachers of government-owned secondary schools in Bayelsa State.

### DISCUSSION OF FINDINGS

The findings of the study were discussed as follows:

With respect to beliefs about breast cancer detection and prevention, the analysis showed that respondents had right beliefs ( $\bar{x} = 3.66$ ) about breast cancer detection and prevention, which is in line with the findings of Knight (2003) that all events in the history of the world, and in particular, the actions and incidents which make up the story of each individual life are determined by fate. Also according to Talbert (2008), there is cancer fatalism which is the belief that all things in the world are under the control of some invisible forces, and we are powerless to do anything about it. Hence the belief that situations such as illnesses or catastrophic events, happen because of a higher power (such as God), or they are just meant to happen, and cannot be avoided. Thus the belief that death is inevitable when cancer is present had also been identified as a barrier to participation in cancer screening, detection and prevention (Powe, 1997). This is not in any way a surprise because of the individual differences in the belief pattern.

The practice of breast cancer detection and prevention among female secondary school teachers in Bayelsa State was very poor (38.2). In the views of Rutledge (1987), several reasons have been reported for women not practicing breast cancer detection and prevention, besides initial ignorance of the procedure. The reasons include lack of time, lack of self-confidence in their own ability to perform the technique correctly, fear of the possible discovery of a lump and embarrassment associated with manipulation of the breast.

With respect to influence of religion on practice of breast cancer detection and prevention, table 8 reveals that among the different religious organizations, the practice of breast cancer detection and prevention, the highest were Muslims (46.3%), followed by Christianity (33%), Traditional religion (20%) and others (18.8%). Also table 12 reveals that religion has no significant influence on the practice of breast cancer detection and prevention, since the  $\chi^2$  calculated value (1.036) is less than the  $\chi^2$  critical value (7.82) at the degree of freedom (3) at 0.05 alpha level. The findings of Ali, Mehreggan and Soghran, (2003), which suggests that most Muslim women do not perceive breast self-examination as being against their Islamic beliefs and that they believe clinical breast examination by a male physician does not interfere with their religious beliefs. This is a surprise, considering their way of life, sharia law and their dressing code.

With regards to influence of marital status on beliefs about breast cancer detection and prevention, Table 10 shows the beliefs about breast cancer detection and prevention among female secondary school teachers with an overall grand mean for unmarried ( $\bar{x} = 3.56$ ), married ( $\bar{x} = 3.57$ ), divorced ( $\bar{x} = 3.32$ ), separated ( $\bar{x} = 3.24$ ), and widowed ( $\bar{x} = 3.25$ ). The means of the different marital status did not differ much from each other and also indicated that they had right beliefs about breast cancer detection and prevention. It could further be seen that marital status had no significant influence on beliefs about breast cancer detection and prevention among female teachers of government-owned secondary schools in Bayelsa State. Since F-calculated value (1.314) is less than F-critical value (2.21) at degree of

freedom ( 5 & 839) at .05 alpha level.

Table 11: shows the practice of breast cancer detection and prevention amongst female secondary school teachers from urban area (32.3%) and (33.9%), of their counterparts from rural area. It implies that majority of the teachers in both urban and rural areas, practice of breast cancer detection and prevention was very poor. It is also evident in table 15, that location had no influence on practice of breast cancer detection and prevention among female secondary school teachers in Bayelsa State. Since the  $\chi^2$  calculated value (.563) is less than  $\chi^2$  critical value (5.99) at degree of freedom (2) at .05 alpha level. This is in line with the findings of Opoku, Benwell and Yarney (2012). Where the overall, uptake was generally low. Only 2% of the women reported ever undergone mammography screening in their lifetime, and 12% reported having been examined by a health care professional once in their lifetime. However, none of the women reported adhering to recommended screening guidelines for any of the programmes.

## CONCLUSION

Finding from the study showed that majority of the female teachers had right beliefs ( $\bar{x} = 3.15$ ) about breast cancer detection and prevention but did not translate to their practice. The poor practice of breast cancer detection and prevention could be a good reason why there is no reduction on the morbidity and mortality rate of breast cancer cases in Bayelsa State.

## RECOMMENDATIONS

State government should sponsor and organize workshops/ seminars on the importance of putting into practice, the detective and preventive measures of breast cancer among women in general. There is also urgent need to design more interventions and also to implement and re-enforce existing cancer awareness and cancer screening programmes.

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*Full Length Research*

## **The Dilemma of Juvenile Delinquency among Government Secondary Schools in Jema'a Local Government Area of Kaduna State Nigeria**

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The essence of this research was to investigate the prevalence of juvenile delinquency among secondary school students in Jema'a local government of Kaduna state Nigeria. The study had two objectives. Two research questions guided the study. The descriptive survey design was adopted. The population consisted of 5 government secondary schools, 8800 students and 178 teachers. 30 teachers and 90 students were randomly sampled. The instruments used were two questionnaires, The Juvenile Delinquency Questionnaire for Teachers (JDQT) and the Juvenile Delinquency Questionnaire for Students (JDQS) The validity of the instruments were established by two experts in social study education. The analysis of the data was done through percentages and rank ordering. Findings revealed a number of delinquent acts such as students hanging on trees and bushes around the schools, examination malpractices, destruction of school properties, stealing, and smoking Indian hemp. A cumulative analysis points at potential terrorist. Provision of counseling service for both parents and students, Kazan facilities, adoption innovative teaching strategies, award of scholarships, poverty alleviation programs are among the highlights of recommendations

**Keywords:** Dilemma, juvenile, delinquency, government, secondary, schools

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### **INTRODUCTION**

In every society there are rules and regulations governing the behaviors of its members. A breach or violation of such rules and regulations, amount to social behavior that is sharply in contrast to the customary, traditional, or

generally accepted standard of behavior (Enderson, 2006). A juvenile is a prepubescent child, a person not legally of age, or is younger than may be charged with an offence. A delinquent is an individual who fails to obey

the laws (Oxford English dictionary online, 2010). Juvenile delinquency is the behavior of a child or youth that is so marked by violation of law, persistent mischievousness, antisocial behavior, disobedience, or intractability as to thwart correction by parents and to constitute a matter for by the juvenile courts (Thesaurus dictionary online, 2016). Juvenile delinquents are minors usually defined as been between the ages of 10 and 18 who have committed some act that violates the law of conduct. These acts aren't called "crimes" as they would for adults. Instead of a trial, the juvenile has an "adjudication" after which the juvenile receives a "disposition" and a sentence. However juvenile proceedings differ from adult proceedings. Delinquent acts generally fall into two categories. The first type of delinquent act is one that would be considered a crime had an adult committed it. For particular serious crimes, some jurisdictions will even try children as adults. The second type of delinquent act is one that wouldn't normally be a crime had a child performed it. These are typically known as "age-related" or "status" crimes.

The success of socialization process is said to be the determinant of children's behavior. This means that if the agents of socialization are used positively, children will come up with positive behaviors as such become helpful to the family, school and the entire society. Bhatia and Singhai (2001) are of the view that if parents, teachers and friends should have profound affection, provide profound security and approbation which are fundamental emotional needs of every human being, juveniles will have positive orientations. Children must be nurtured under supervision, guidance, protection and discipline in right proportions avoiding both excuses as well as neglect. In other words all life styles of parents and teachers must serve as models worth of emulation by children.

In Nigeria, secondary school students in the past were characterized by respect for parents, elders and teachers while drinking, stealing, truancy, examination malpractices, smoking, were not common practices among youth, these were termed as taboo (an inhibition that results from social custom or emotional aversion) to the society. Chaba (2002) avowed that students often get involved in antisocial behaviors because they feel that if they do not, they will be social misfits or termed as old fashioned among their peer groups or friends. Yosi (2015) blames the federal government for the increase in juvenile delinquency by taking over missionary schools. Since then there had been a steady increase in juvenile delinquency. This indicates that the tiers of government pay little attention on the aspect of morality. This is what Mboy (2010) describes as "Teaching knowledge without morality". In other words there is no balance in the academic system. In line with this the researchers discovered in the course of this research that in most of the schools religious knowledge has been replaced with

civic education (civic education in a democracy is education in self- government. Democratic self- government means that citizens are actively involved in their own governance; they do not just passively accept the dictums of others or acquiesce to the demands of others). Civic education is now a compulsory subject while religious education has been made optional. Confirming this fact, a West African Examination Chief Examiner disclosed to the researchers that the number of students who sat for religious education in the 2015 West African senior secondary examinations dropped with about 70% compared to previous years. This is a way of gradually bidding farewell to religious education in the Nigerian educational system and it is a pointer to an increasing rate of juvenile crimes in the country in its entirety.

Several theoretical models emphasized the relationship between education and delinquency, an association between academic achievement and delinquent behavior has been proposed by various hypothetical and theoretical approaches in literature. The school of failure hypothesis suggests that the failure experienced in school by juveniles with learning disabilities is the first of many negative experiences that will result in delinquency because of the development of a negative self- image (Deyanira, 2005). Channon and Williams (2014) found plausible evidence that delinquency by age 16 reduces the likelihood of graduating from high school and college. It is therefore pertinent to address juvenile delinquency with all aggression to combat illiteracy and its offshoots. The consequences of juvenile delinquency are many these include; personality disorders, conduct disorders, juvenile crime, interpersonal conflicts antisocial personality disorders, Kazan phenomenon, deviance, class attention deficit disorders, unwanted pregnancies and school dropout. According to Channon and Williams (2014) the cost of reduced educational attainment amongst delinquents is likely to have broader societal effects via decreased productivity and slowed economic growth. The results from the base line model provide plausible evidence that participation in delinquent activity by age 16 have far reaching consequences.

## STATEMENT OF THE PROBLEM

The crime rate in Jema'a local government area of Kaduna state is on the increase and sadly the culprits are most times young people who are just getting to the prime of their lives. The continuing patterns of delinquency include a long list of status offences. Juvenile crime is a perennial public concern. It includes theft, shoplifting, absenteeism and bullying in school, consumption of alcohol, smoking, running away from home etc. One of the major problems facing Jema'a local government area today is the rising trend of juvenile

delinquency in secondary schools. Destruction of public property has become the order of the day since early eighties and up to date it is difficult to have a whole academic session without unrest leading to the destruction of lives and properties, in the same vain children now dictate what suits them even if such things go against the norms of the society. Everyday complaints are launched here and there in respect of lack of discipline and lukewarm attitudes to studies amongst youth in the schools. Disciplinary measures are no longer adhered to. There had been a general assumption that lack of teachers' dedication, lack of religious teaching for moral instructions and general school failure has led to juvenile delinquency in secondary schools in Jema'a local government.

### **PURPOSE OF THE STUDY**

The focus of this study is to investigate the prevalence of juvenile delinquency amongst secondary school students. Specifically the objectives of the research were the following:

1. Unearth the highest risk factors of juvenile delinquency in Jema'a local government area of Kaduna state.
2. Discover the most delinquent behavior exhibited by juveniles in the study area.

### **RESEARCH QUESTIONS**

1. What are the highest risk factors of juvenile delinquency?
2. What is the most common delinquent behavior exhibited by juveniles in the study area?

### **SIGNIFICANCE OF THE STUDY**

This study will help teachers to identify juvenile conduct disorders and provide appropriate referral, and understand the importance of using effective pedagogies to sustain the interest of the students. It will help parents understand the nature and changes emerging in the transition period from childhood to adolescence and provide appropriate guidance and needs for their children. By understanding the needs for adolescents curriculum planners can restructure the various curricula to attract the attention of learners. The study will create a need for the ministry of education to organize seminars, workshops and conferences for teachers. The results of the findings from this study will make school guidance counselors become familiar with the problems of adolescents so that proper behavioral guidance may be

provided for juveniles. The study will also be useful to juvenile courts and reformatory centers to see the need to provide remediating services to juvenile delinquents in schools and in the streets. The results from this research will be of benefit to the ministry of social welfare, youth and sports, the tiers of government in terms of decision making especially those that have to do with young people. The research is also aimed at providing literature to researchers who want to investigate further issues on juvenile delinquency. The study will educate families by providing them with information how to raise socially healthy children. It will teach children on the effects of drugs, gangs, sex and weapons.

This will go a long way to prevent insurgencies. The study will create awareness in the community through the girl brigade, Boys scout, Churches, mosques and other non- governmental organizations and volunteer groups to provide youths with the opportunity to interact in a safe social environment. The study will advocate for the establishment of the Nebraska Correctional Youth Facility (NCYF). This is a detention facility that gears its programs towards restoring delinquent youth. The facility holds young adults violent offenders and juvenile delinquents who have been tried in adult court for committing violent crimes. It is a maximum security institution that assists young inmates by providing them with the help they need to change their behavior.

### **THEORETICAL FRAMEWORK**

The study anchored on the anomie theory of differential association and the labeling theory. The anomie also known as the strain theory has its first version written by Merton (1957) who gave a biological explanation of deviance and concluded that biology cannot account for variations from one society to the next in the nature and extent of deviance. His primary interest was not so much why a particular individual deviates but why the rate of deviance, differ so dramatically in different societies and for different subgroups within a single society. Anomie is the explanation for high rates of deviant behavior. Anomie is a condition in which society provides little moral guidance to individuals. This explains the rising rate of juvenile delinquency in Jema'a local government area. Durkheim (2006) introduced the concept of anomie to describe the mismatch guild labor to evolving societal needs when the guild was homogeneous in its constituency. He equated homogeneous (redundant) skills to mechanical solidarity whose inertia retarded adaptation. Durkheim contrasted the condition of anomie as being the result of a malfunction of organic solidarity during the transition from mechanical solidarity. Durkheim's use of the term anomie was about a phenomenon of industrialization mass regimentation that could not adapt due to its own inertia, its resistance to

change which causes disruption cycles of collective behavior. Durkheim associated anomie to the influence of a lack of norm or norms that were too rigid. But such normlessness or norm-rigidity was a symptom of anomie, caused by the lack of differential adaptation that will enable norms to evolve naturally due to self-regulation, either to develop norms where some existed or to change norms that had become rigid and obsolete.

The strain theory states that social structures within society may pressure citizens to commit crime. Strain theory holds that crime is caused by the difficulty those in poverty have in achieving socially valued goals by legitimate means. As those with, for instance poor educational attainment have difficulty achieving wealth and status by securing well paid employment, they are more likely to use criminal means to obtain these goals. Merton suggests five adaptations to this dilemma:

1. Innovation: individuals who accept socially approved goals, but not necessarily the socially approved means.
2. Retreatism: those who reject socially approved goals and the means for acquiring them.
3. Ritualism: those who buy into a system of socially approved means, but lose sight of the goals. Merton believed that drug users are in this category.
4. Conformity: those who conform to the systems means and goals.
5. Rebellion: people who negate socially approved goals and means by creating a new system of acceptance goals and means.

The theory of differential association also deals with young people in a group context, and looks at how peer pressure and the existence of gang could lead them into crime. It suggests that young people are motivated to commit crimes by delinquent peers and learn criminal skills from them. There is strong evidence that young people with criminal friends are more likely to commit crimes themselves.

Labeling theory is a concept within criminology that explains deviant behavior from the social context rather than looking at the individual. It is part of interactionism criminology that states that once young people have been labeled as criminals they are more likely to offend. The idea is that once labeled as deviant a young person may accept that role, and be more likely to associate with others who have been similarly labeled. Labeling theorists believe that male children from poor families are more likely to be labeled deviant, and that this may partially explain why there are more working class young male offenders. Several theoretical models emphasize the relationship between education and delinquency. A relationship between academic achievement and delinquent behavior has been proposed by various

hypothetical and theoretical approaches in literature. The school failure hypothesis suggest that the failure experienced in school by juveniles with learning disabilities is the first of many negative experiences that will result in delinquency because of the development of negative self- image (Deyanira, 2005).

## METHODOLOGY

A descriptive analytic survey design was adopted. The population consisted of 5 public secondary schools, 178 teachers and 8800 students in Jema'a local government area of Kaduna state. Thirty teachers and 90 students were randomly sampled. Two questionnaires for teachers and students were used to collect data. The validity of the instruments was established by two experts in social studies education. The data collected were analyzed using percentages, frequency count and rank ordering

## RESULTS AND DISCUSSION

The research questions were answered in this section and explanation to the results given.

### Research Question One

What are the highest risk factors of juvenile delinquency in Jema'a local government area?

Table 1 highlights the highest risk factors of delinquency amongst youth in Jema'a local government area. These include: lack of parental care, poverty, bad teaching methods, broken homes, lack of guidance counselors in schools, poor performance in school, lack of adequate instructional materials and bad association. Other risk factors (0) are underpinned.

**RESEARCH QUESTION TWO:** What is the most common delinquent behavior exhibited by juveniles in the study area?

From the analysis made in table 2 absence from school with no genuine reasons ranks first. Second on the list is examination malpractice. Third on the list is the breaking of school rules and regulations, violence, smoking of Indian and lying.

## DISCUSSION

The results revealed that poverty, lack of parental care, broken homes, bad teaching methods, lack of guidance counselors amongst others are responsible for juvenile delinquency in Jema'a local government area of Kaduna state. Statistics indicates that truancy is the most

Table 1: Highest risk factors of juvenile delinquency

Highest Risk Factors Responsible for Juvenile Delinquency	Yes	%	No	%	No idea	%
Poverty	85	70.8	35	29.2	0	0
Bad Method of Teaching	70	58.3	43	35.8	7	5.8
Broken Homes	95	79.2	20	16.6	5	4.2
Lack of Parental Care	110	91%	10	8.3	0	0
Poor Performance in School	63	53.3	37	30.8	20	16.7
Inadequate Instructional Materials	53	44.2	54	45	13	10.8
Non Involvement of Religious Teachers	65	54.2	43	38.8	12	10
Large Family Size	0	0	0	-0	0	0
Home Discord	0	0	0	0	0	0
Child Maltreatment	0	0	0	0	0	0
Antisocial Parents	0	0	0	0	0	0
Antisocial Delinquent Peers	0	0	0	0	0	0
Neighborhood Crime and Drug	0	0	0	0	0	0
Harsh Discipline	0	0	0	0	0	0
Poor Monitoring Supervision	0	0	0	0	0	0
Low Economic Status	0	0	0	0	0	0
Abusive Parents	0	0	0	0	0	0
Family Conflicts	0	0	0	0	0	0
Poor parent-child Relationship	0	0	0	0	0	0
Gang Membership	0	0	0	0	0	0
Child Neglect	0	0	0	0	0	0
Hyper activity	0	0	0	0	0	0
Exposure to Television Violence	0	0	0	0	0	0
Emotional Factors	0	0	0	0	0	0
Peer Rejection	0	0	0	0	0	0
Low Academic Aspiration	0	0	0	0	0	0
Access to Weapons	0	0	0	0	0	0
Teenage Parenthood	0	0	0	0	0	0
Parental Psychopathology	0	0	0	0	0	0
Sibling Negative Influences	0	0	0	0	0	0
Teacher Victimization	0	0	0	0	0	0
School Large Enrolment without Adequate Facilities	0	0	0	0	0	0
School Poor Rule Enforcement	0	0	0	0	0	0
Bad Association	91	75.8	24	20	5	4.2
Lack of Guidance Counselors	84	70	26	21.7	10	8.3

delinquent behavior engaged in by students. This accounts for academic failure. The results obtained are consistent with Bature (2014) who also observed that peer group have powerful effects on human conduct and can dramatically influence decision making and behavior choices. The findings also agrees with Alvarado and Kumpfer (2000) who avowed that bad parenting practice and family environment have contributed to juvenile delinquency.

## WAYS TO CURB JUVENILE DELINQUENCY

The prevention of juvenile delinquency is an essential part of crime prevention in a society. By engaging in lawful, socially useful activities and adopting a humanistic orientation towards society and outlook on life, young persons can develop non-criminogenic attitudes. The successful prevention of juvenile delinquency requires efforts on the part of the entire society to ensure the harmonious development of adolescents with respect to the promotion of their personality from early childhood. The need for and importance of progressive delinquency prevention policies and the systematic and the

Table 2. Most common delinquent behavior exhibited by juveniles

<b>Most Common Juvenile Delinquent Behavior</b>	<b>1<sup>st</sup></b>	<b>2<sup>nd</sup></b>	<b>3<sup>rd</sup></b>	<b>4<sup>th</sup> Ranks</b>	<b>5<sup>th</sup></b>	<b>6<sup>th</sup></b>	<b>7<sup>th</sup></b>	<b>8<sup>th</sup></b>	<b>9<sup>th</sup></b>	<b>10<sup>th</sup></b>
<b>Truancy</b>	41	25	11	15	10	4	5	2	3	4
<b>Stealing</b>	10	10	12	20	7	14	10	15	6	7
<b>Disobedience</b>	17	35	12	10	5	7	11	14	5	4
<b>Aggressiveness</b>	15	7	17	6	10	10	6	17	12	10
<b>Destruction of school properties</b>	10	9	7	8	5	15	10	8	23	15
<b>Examination malpractice</b>	30	15	30	9	10	10	5	4	4	3
<b>Lying</b>	15	4	10	15	7	10	17	28	8	9
<b>Unwanted pregnancy</b>	5	10	13	12	5	19	17	10	9	20
<b>Violence</b>	15	9	5	14	10	11	26	14	8	8
<b>Smoking Indian Hemp</b>	15	10	8	5	25	6	20	5	20	6

elaboration of measures should be recognized. Community-based services and programs should be developed for the prevention of juvenile delinquency, particularly where no agencies have been established. Comprehensive prevention plans should be instituted at every level of government which should include the followings:

1. In-depth analysis of the problem and inventories of programs, services, facilities and resources.
2. Provide well- defined responsibilities for the qualified agencies, institutions and personnel involved in preventive efforts.
3. Develop mechanisms for the appropriate coordination of prevention efforts by governmental and non-governmental agencies.
4. Policies, programs and strategies based on prognostic studies to be continuously monitored and carefully evaluated in the course of implementation.
5. Youth participation in delinquency prevention policies and processes, including resources to community resources and youth self-help.
6. Special attention should be given to children of families affected by problems brought about by rapid and uneven economic, social and cultural change, in particular the children of migrants and refugee families.
7. Promotion and development of the personality, talent and mental and physical abilities of young people to their full potentials.
8. Provision of positive emotional support to young

persons and the avoidance of psychological maltreatment.

9. Schools should serve as resource and referral centers for the provision of medical, counseling and other services to young persons, particularly those with special needs, and suffering from abuse, neglect, victimization and exploitation.
10. School systems should attempt to meet and promote the highest professional and educational standards with respect to curricula, teaching and learning methods, approaches and the recruitment and training of qualified teachers. Regular monitoring and assessment of performance.
11. School systems should plan, develop and implement extracurricular activities of interest to young persons, in cooperation with community groups.
12. Special assistance should be given to children and young persons who find it difficult to comply with attendance codes and to drop-outs.
13. Schools should promote policies and rules that are fair and just. Students should be represented by bodies formulating school policies, including policy on discipline and decision making.
14. Community-based services and programs which respond to the special needs, problems, interests and concerns of young persons and which offer appropriate counseling and guidance to young persons and their families should be developed.
15. Communities should provide a wide range of community-based support measures for young persons, including community development

centers, recreational facilities and services to respond to the special problems of children who are at social risks.

16. A range of services and helping measures should be provided to deal with the difficulties experienced by young persons in the transition to adulthood. Such services should include special programs for young drug abusers which emphasize care counseling, assistance and therapy-oriented interventions.
17. Youth organization should be created at local level and given full participatory status in the management of community affairs. These organizations should encourage youth to organize collective and voluntary projects, particularly projects aimed at helping young persons in need of assistance.
18. The mass media should be encouraged to ensure that young persons have access to information and materials from a diversity of national and international sources.
19. The mass media should be encouraged to disseminate information on the existence of services, facilities and opportunities for young persons in the society.
20. Parents should be educated on their responsibilities towards their children
21. Religious education including moral instruction should be made compulsory
22. Poverty alleviation programs should be established

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*Full Length Research*

## **Effects of Child's Own Book Technique on the Expansion of Language Fluency of Stutterers in Jos North Lga of Plateau State**

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The study examined the effects of child's own book technique on the expansion of language fluency of stutterers in Jos North LGA of Plateau State. The pre-test post-test experimental design was adopted for this study. The target sample of the study comprised of 14 teachers and 8 stuttering pupils of Government Primary School Tudun Wada both in Jos North LGA of Plateau State. The instruments used for the study consists of; Teachers Questionnaire (TQ) and the Stuttering Pupils Oral Test (SPOT). Among the major findings of the study are; the child's own book technique a great impact on the language fluency and improving the self-esteem of stuttering pupils, there is a significant difference between the posttest mean score of primary school stuttering pupils exposed to child's own book technique and those not exposed and finally, the study revealed that stuttering pupils are very excited when they are being given the opportunity dictate and own a story book written in their own words with the help of the teacher. It was however recommended that the child's own book technique amongst other fluency shaping techniques should be used by teachers in expending language fluency and there is need teachers to be able to assist stuttering pupils in their classroom through making improvisations such as the helping the child make a child's own story book to improve language skills.

**Key words:** stuttering, fluency, speech, communication

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### **INTRODUCTION**

Speech serves as the basic goal of self-expression and communication between the speaker and another individual or group of individuals. It is an act of producing

sounds and words fluently and most importantly effortlessly so that whatever is uttered conveys adequate meaning or sense to the listeners. However,

inappropriate phonetic selections, insufficient cues and other critical distortions could affect communication. Stuttering as defined by the Speech Foundation of America (2004), is a communication disorder that is characterized by involuntary disruptions of flow of speech, particularly when such disruptions consists of repetitions or prolongations of sound or syllable, and when they are accompanied by avoidance struggle behaviour.

According to Yaruss & Hammer (2013), stuttering is highly variable as sometimes a child will stutter a lot and sometimes the child will be fluent. However, factors influencing the likelihood that stuttering will occur differ from one child to the next, but might include: who the child is talking to; what the child is talking about; where the child is when talking; what time of day or year the child is talking; the child's emotional or physical state (e.g., excitement, fatigue, illness) while talking; the length and complexity of the message the child wishes to convey as well as other factors that are more difficult to identify

Recent research studies have shown that the incidence of stuttering among primary school pupils in Nigeria is speculative. More so, pupils who stutter are found in classrooms at the elementary, secondary and tertiary levels of education. However, Adima, Ladipo, and Abosi, (1997) estimated the number of speech impaired pupils in the primary schools is quite alarming and there are inadequate measures put in place to remediate it. The absence of Speech-Language Pathologists' (SLPs) in schools has posed a challenge to teachers and parents to adopt therapies and programmes for this group of children with special needs.

Language fluency is used informally to denote broadly a high level of language proficiency most typically foreign language or another learned language. Therefore fluency is necessary but not sufficient for language proficiency (Speech Foundation of America, 2004). Therefore, an individual is said to be fluent if he/she is understood by his listeners/audience. More so, individuals who stutter require therapies/techniques that will address and manage such special need as well as provide early intervention/treatment. Among the various techniques used in remediating stuttering is the Childs' Own Book Technique which focuses on teaching the individual to speak more fluently using his/her own words (Blomgren, 2005).

The Childs' Own Book Technique involves the child telling a story, dictating the story and writes a story book with the assistance of a teacher. However, presenting written stories in the Childs' own words is always of particular interest to the child. Therefore there is need to assess the effectiveness of Childs' Own Book Technique in expanding language fluency for stuttering children. It is against this background that the researcher seeks to provide empirical evidence on the effect of Childs' Own

Book Technique on the expansion of language fluency of stutterers in selected primary schools in Jos North LGA of Plateau State.

## STATEMENT OF THE PROBLEM

Stuttering takes a lot of emotional and cognitive effort which results in significant shame for the person who stutters. This, in turn, often limits the child's ability to participate in activities at school or in social settings. More so, it is more difficult to eliminate stuttering and the child is more likely to begin experiencing the shame and embarrassment that characterizes advanced stuttering in adults. Therefore, improving and expanding fluency is still a major focus of treatment and remediation. However, a necessary additional goal involves helping children to develop healthy, positive attitudes toward themselves and toward their speech, even if they are still stuttering. Similarly, parents sometimes do not play very central roles in this process by conveying acceptance of their child's speaking abilities and by providing a supportive environment where the child can both stutter and learn to speak more fluently. Similarly, teachers do not make efforts in improving the child's language skills, the child's ability to move his or her mouth when speaking and the child's temperament. Therefore, the reactions of those in the child's environment play a role in the development and expansion of language fluency amongst stutterers. Based on the above statement, the researcher seeks to provide empirical evidence on the effect of Childs' Own Book Technique on the expansion of language fluency of stutterers in selected primary schools in Jos North LGA.

## PURPOSE OF THE STUDY

The aim of this study is to examine effects of Childs' Own Book Technique on the expansion of language fluency of stutterers in selected primary schools in Jos North LGA. Specifically, the study intends to achieve the following objectives:

1. To determine the extent to which Childs' Own Book Technique will expand the language fluency of stutterers.
2. To compare the language fluency levels of stutterers exposed to the Childs' Own Book Technique and those not exposed.

## Research Questions

The following questions are formulated to the guide to the study:

1. To what extent are teachers able to improvise instructional materials for language expansion among stutterers?
2. To what extent will stuttering students be able to write his/her own story?

### Research Hypothesis

The following hypothesis is formulated to the guide to the study:

There is no significant difference in the mean achievement test scores of stutterers in the Stuttering Students Oral Test (SSOT)

### SIGNIFICANCE OF THE STUDY

It is expected that the findings of this research will be of great benefit to the following persons will benefit from the findings of this study. Firstly, it is expected that the findings of this research will enable teachers employ appropriate therapies improving and expanding language fluency for stutterers. Similarly, parents of stuttering children will be able to supplement strategies with other techniques to help children develop healthy positive attitudes about their speaking abilities. This study will be of immense benefits to the government on the need to involve Speech-Language Pathologists (SLPs) in the institutions of learning and at all levels of learning to provide services to students with speech problems. In addition, this study will pave way for educational researchers to carry out studies on speech related disabilities and how they affect teaching and learning in schools.

### REVIEW OF RELEVANT LITERATURE

#### Concept, Nature and Characteristics of Stuttering

As defined by West (2012) stuttering is a speech/language impairment characterized by disruptions in the forward flow of speech (or speech dis-fluencies), such as repetitions of whole words or parts of words, prolongations of sounds, or complete blockages of sound. Speech dis-fluencies may be accompanied by physical tension or struggle, though many young children do not exhibit such tension in the early stages of the disorder. Stuttering is a speech/language impairment characterized by disruptions in the forward flow of speech (or speech dis-fluencies), such as repetitions of whole words or parts of words, prolongations of sounds, or complete blockages of sound. Speech dis-fluencies may be accompanied by physical tension or struggle, though

many young children do not exhibit such tension in the early stages of the disorder.

More so, stuttering is often described by repetitions and blocks that stop the forward flow of speech. The individual does not know why or how this happens and it often manifest when he/she avoids stuttering (Communication Therapy Institute, 2015; Wendel, 2013). In addition, children experience fear or embarrassment because of their stuttering and as a result they may learn to hide their stuttering so it does not show. They can do this by avoiding speaking in certain situations or to certain people. They might also avoid saying words they think they might stutter on or refrain from talking altogether. If a child begins to avoid speaking in order to avoid stuttering, the disorder can have a marked impact on his or her social, emotional, and educational development (Stuttering Foundation of America, 2014).

As maintained by Sherman (2012), sometimes older children and adolescents become so adept at hiding their stuttering that other people may not even know that they stutter. Although this might sound like a good goal, it typically is not. Hiding stuttering takes a lot of emotional and cognitive effort and results in significant shame for the person who stutters. This, in turn, often limits the child's ability to participate in life activities at school or in social settings. However, the best way to deal with stuttering is not to try to hide it, or to hide from it, but rather to face it directly. Many times, children experience fear or embarrassment because of their stuttering and as a result, they may learn to hide their stuttering so it does not show. They often achieve this by avoiding speaking in certain situations or to certain people. In addition, they might also avoid saying words they think they might stutter on or refrain from talking altogether.

More so, if a child begins to avoid speaking in order to avoid stuttering, the disorder can have a marked impact on his or her social, emotional, and educational development (Blomgren, 2005). However, sometimes older children and adolescents become so adept at hiding their stuttering that other people may not even know that they stutter. In addition, hiding stuttering takes a lot of emotional and cognitive effort and it also results in significant shame for the person who stutters (Yaruss & Hammer, 2013). This, in turn, often limits the child's ability to participate in life activities at school or in social settings. The best way to deal with stuttering is not to try to hide it, or to hide from it, but rather to face it directly.

Consequently, as outlined by Wendel (2013), stuttering is a speech/language impairment characterized by disruptions in the forward flow of speech such as repetitions of whole words or parts of words, prolongations of sounds, or complete blockages of sound. There are two major types of stuttering: (a) Clonic Stuttering: this is characterized by repetition (lax/tense); (b) Tonic Stuttering: this is characterized by blockages and or lengthening of sounds. Some characteristics of

stuttering are not easy for learners to detect. However, some general characteristics of clonic and tonic cluttering include the following: irregular breathing; while stuttering, there are body movements along with stuttering; there is positioning of some sound, or words e.g. there is repetition of previous words said; there is avoidance of words/situations and refusing to talk; loss of eye contact; tremors of the lips, eyelids and jaws, jaw and arm jerks, facial grimaces, tongue protrusion, increased body tension, breathing irregularities and nasal snorts.

However, specific signs of stuttering include the following: A) Syllable repetitions: repetition of more than two syllable or words e.g. Train: he pronounces tr-tn-train; he repeats more than 2 words out of 100 words. Tempo repetitions should be faster than normal speech regularly to irregular repetitions; B) Prolongation of Sound: i) Duration of more than one second, ii) More than 2 prolongation in 100 words, iii) Irregularity, iv) Tenseness v) Rise in pitch (voice) and vi) Interpretation of airflow in voiceless sounds. C) Silent pauses: i) Individual silently pauses in a word/after dis-fluency, ii) Individual silently pauses in a word before trying to speak D) Phonation (voice): i) His voice is monotonous, ii) There is stop in phonation E) Articulation position is often wrong: articulation are often wrong in a stuttering person F) Frustration/reaction: more interrupted words makes the individual feel frustrated, bitter, angry and also when one stutters the negative reaction of both in himself and others causes more stuttering. Similarly, the negative reactions could be from friends, parents, siblings, teachers as well as other members of the child's immediate community (Wendel, 2013).

However, related causes of stuttering as highlighted by Eckardt, (2010) include the following: a) Hereditary: studies have shown that some children who stutter tend to have parents and/or relatives who also stutter; b) Dominance: the dominance theory holds that people who by nature are left handed and are forced to be right handed tend to stutter. This often arise as a result of frustration; c) Perceptual defect: if the auditory perception of an individual is faulty, one tends not to hear his/her speech and the speech becomes faulty; d) Lip-tongue disorder: individuals who have disorders of the lips or tongue often experience speech disorder as this hinders fluent speech flow; d) Psychodynamic causes: psychodynamic theory propounded by Sigmund Freud postulated that stuttering is a sign of neurosis. Neurosis is a group of disorders in which the person has developed certain behaviour patterns that he tends to avoid rather than cope with problems. However, anxiety is the core of neurosis and is caused by the lack of satisfaction at ones developmental stages that causes people to stutter. Formerly, hypnosis as a therapy was used in remediating such cases whereby patients were brought to their childhood and the problem was discovered and finally e) Socio-economic

background/Environment: Research has shown that people who struggle to be successful in life stutter more. However, there are three classes of people existing which includes the low, middle and higher or upper class people. In this case, people from the higher class often showed more signs of stuttering.

### **The Child's Own Book Technique**

The Child's own book technique is also referred to as the Language Experience Approach (LEA) used in teaching reading and remedial readers. This technique allows a child to learn how to read from his own dictated reading material. The reading material is based on the own child's own language and experiences. This material is automatically meaningful to that. More so, Anzayi & Umolu (2004), emphasized that this technique is appropriate for teachers to use when working directly with the child who stutters. The teacher must decide the appropriate time suitable for him/her to work directly with the child

The following are steps involved in the Child's Own Book Technique:

#### **Step One: Talk**

Teacher says to the child, "today I would like you to tell me a story. I will write down the story exactly as you tell it to me so that we can read it together later". Most children like telling stories either on events like football match or folktale stories on animals like monkey, lion, elephant, etc. However, if the child is unable to tell a story, let him draw the story and tell about his picture.

#### **Step Two: Child dictates while teacher writes**

Teacher says to the child, 'Now I am going to write your story exactly as you tell it. Talk slowly and watch me write the words as you say them. First, I will write the title of the story. Let the child give a name. Remember that when writing the story, you must.

1. Sit with the paper facing the child so that he/she can watch you write every word or let the child write the story him/herself.
2. Print the words very neatly. Do not use joined writing and do not write in capitals. Capital letters should be used to begin sentences and names of people and places only.
3. Say the words as you write them or encourage the child to so.

### Step Three: Read the story together

Teacher could say to the child, "you have told a beautiful story. Now we will read your story together. Watch as I point to each word while we read your story together. Watch as I point to each word while we read". The child should not read after you, you should read together with child at the same time or else the child will be passive, or simply learn to memories the story.

### Step Four: Child illustrates the story

Teacher asks the child to draw pictures about the nice story that he has written. Draw a picture on the page opposite the one the story is written on. In case he draws the story before telling it, skip this step.

### Step Five: Child practices reading his story

The child's story should be read after the day it was told and the child should be encouraged to read his/her story to other children. If possible let the child take the story home to read to his family members. (Anzayi & Umolu (2004).

## RESEARCH DESIGN

The pre-test post-test experimental design was adopted for this study. As posited by Awotunde, Ugodulunwa and Ozoji (2002) experiments enable the researcher to draw causal inference and to observe whether a variable (the independent) causes another variable (the dependent) to change. In other words, an experiment involves the comparison of the effect of a particular treatment with that of a different treatment or no treatment.

### Population and Sample of Study

The population of this study compress of teachers and stuttering pupils in selected primary schools in Jos North LGA. The sample of the study comprises of selected teachers and stuttering pupils of Government Primary School Tudun Wada and Gaskiya Highland private school in Jos North LGA of Plateau State.

### Sampling Technique

The purposive sampling technique was used in drawing the sample for the study as well as assigning the pupils to the experimental and control groups. The sample of the study comprised of 14 teachers and 8 stuttering pupils of

Gakiya Highland primary school and LEA primary school Tudun Wada Jos, Plateau State. The selection of the two schools in Jos North LGA was informed by their convenience and proximity to the researcher and the number of stuttering pupils found in both schools. This facilitated the quick collection of data and early completion of the study

The instruments were used for the study namely; Teachers Questionnaire (TQ) and the Stuttering Pupils Oral Test (SPOT. The former was used to elicit responses from teachers on the effects childs own book technique on the expansion of language fluency of stutters in Jos North LGA. It is a five point attitude scale where respondents were required to tick the option (strongly agreed (SA), agree (A), undecided (U), disagree (D) and strongly disagree (SD). Stuttering Students Oral Test (SSOT) consists of 5 test items that was used to determine the expansion of language fluency of stutters. The questionnaire and the test were personally structured by the researcher and both instruments were used for the purpose of data collection.

### Procedure for Data Collection

A letter of introduction was presented to the school authorities seeking the consent of the schools' head master to allow the researchers conduct the study. The researchers' were introduced to the teacher and pupils in order to develop a good rapport between them. A date was fixed for the researchers to come to the school to administer the teacher questionnaire and teach the pupils for three week. Both groups were given the pre-test and then taught. The experimental group made use of child's own book technique. The control group was taught using the conventional method of teaching language expansion among pupils. At the end of the treatment, both groups received the post-test and data were collected and analyzed accordingly. The questionnaires were administered to the teachers who in turn assisted with administering the achievement test to the pupils. The researchers collected all the distributed questionnaires and achievement test for analysis.

### Method of Data Analysis

The data collected in the course of this research study was subjected to analysis through the use of percentages and inferential statistics. The research questions were analyzed using the percentages while the hypotheses were analyzed using the student t- test.

### Results and Discussion

This chapter seeks to analyze data collected for the purpose of determining the effects of childs own book

**Table 1:** Primary School Pupils

S/N	AGE	MALE	FEMALE	TOTAL
Gaskiya Highland	7 – 9	4(50%)	1(12.5%)	<b>5(62.5%)</b>
LEA Primary school	6 -10	3(37.5%)	-	<b>3(37.5%)</b>
<b>TOTAL</b>		<b>7(87.5%)</b>	<b>1(12.5%)</b>	<b>8(100%)</b>

**Table 2:** Teachers' Population in Both Schools

S/N	AGE	SEX	NCE	QUALIFICATION B.SC	M.SC	PHD	TOTAL
1	25-35	Male	-	4(28.5%)	2(14.2%)	-	<b>6(42.8%)</b>
2	35-45	Male	-	2(14.2%)	1(7.1%)	-	<b>3(21.4%)</b>
3	20-35	Female	-	3(21.4%)	-	-	<b>3(21.1%)</b>
4	35-45	Female	-	2(14.2%)	-	-	<b>2(14.2%)</b>
<b>TOTAL</b>			-	<b>11(78.4%)</b>	<b>3(21.4%)</b>	-	<b>14(100%)</b>

technique on the expansion of language fluency of stutterers in Jos North LGA. The summary of the results are presented thus:

As shown in table 1, a total number of 8 primary school stuttering pupils formed the target sample of population. A total of 7 pupils were males while 1 pupil was a female. Similarly four five students were from Gaskiya Highland Primary School while 3 students were from LEA Primary School Tudun Wada Jos.

As deduced from table 2, total numbers of 14 teachers comprised of the sample of the study. 9 teachers were males while 5 teachers were females. Similarly, eleven

(11) teachers had B.SC qualifications while 3 teachers had M.SC.

#### **Research Question 1**

To what extent are teachers able to improvise instructional materials for language expansion among stutterers?

As deduced from table 3 above, 10(71%) of teachers strongly agree that they are capable of improvising instructional aids for language expansion among stutterers. However, 7(50%) of respondents strongly

**Table 3:** Teachers Response to Research Question 1

S/N	RESEARCH QUESTIONS	SA	A	U	D	SD	TOTAL
1.	Are u capable of improvising instructional aids for language expansion among stutterers	10(71%)	4(28%)	-	-	-	14(100%)
2.	Encouraging language fluency stuttering pupils using childs own book technique is rewarding.	7 (50%)	7(50%)	-	-	-	14(100%)
3.	Childs own story book can easily be improvised by the teacher.	6(42%)	4(2.%)	2(14.%)	2(14.%)	-	14(100%)
4.	Special instructional materials would be very helpful in language expansion among stutterers	10(71%)	4(28.%)	-	-	-	14(100%)

**Table 4:** Teachers Response to Research Question 2

S/N	RESEARCH QUESTIONS	SA	A	U	D	SD	TOTAL
1	Do you think helping the child make his/her own story book is challenging?	1(7.14%)	-	2(14.7%)	-	11(78.57%)	14(100%)
2	The child's own book technique will not improve pupils' fluency and self-esteem.	2(14.7%)	-	3(21.4%)	-	9(64.2%)	14(100%)

**Table 5:** Summary Post- Test Results of the Experimental and Control Group in the Stuttering Students Oral Test(SSOT)

Group	Mean	N	SD	Df.	T- Observed	T -Critical
EXPT	60.00	4				
EXPERIMENTAL AND CONTROL:	11.547	3		3	3.464	1.041
CONT	40.00	4				

agree encouraging language fluency stuttering pupils using childs' own book technique is rewarding. More so, 7(50%) of the teachers also agree to this fact. However, 6 (4.28%) of the teachers strongly agree that child's own story book can easily be improvised by the teacher. Similarly, 10 (71%) strongly agree while 4(28%) agree that special instructional materials would be very helpful in language expansion among stutterers.

### Research Question 2

To what extent will stuttering students be able to write his/her own story?

As presented in table 4 above, 11(78.57%) teachers strongly disagree with the fact that helping the child make his/her own story book is challenging while 1(7.14%) teachers were in agreement with the statement. Similarly, 9(64.2%) teacher strongly disagree that the childs' own

book technique will not improve pupils fluency and self-esteem. However, 2(14.7%) teachers strongly agree with the statement.

### Hypothesis 1

There is no significant difference in the mean achievement test scores oof stutterers in the Stuttering Students Oral Test (SSOT)

As shown in the table 5, the posttest mean score of the experimental group is (60.00) while that of the control group is (40.00). The t - observed is (3.464) and the t - critical is (1.041). In addition, the mean difference for the experimental and control group is (20.00) which is significant. Therefore the null hypothesis that states that there will be no significant improvement in the language fluency of stutterers exposed to the Childs" Own Book Technique and those not exposed is rejected. Therefore, there is sufficient evidence to prove that the use of

Childs" Own Book Technique significant has significant effect on the expansion of language fluency of stutterers.

## DISCUSSION OF RESULTS

The discussion of results in this study is carried out in line with the researches question and hypothesis formulated to guide this study. The table 1 analysis of research questions 1 revealed that, 10 (71%) of teachers strongly agree that they are capable of improvising instructional aids for language expansion among stutterers. However, 7(50%) of respondents strongly agree encouraging language fluency stuttering pupils using childs' own book technique is rewarding 4 (28%) of the teachers also agree to this fact. However, 6 (4.28%) of the teachers strongly agree that childs' own story book can easily be improvised by the teacher. Similarly, 4 (28.5%) agree while 2(14.2%) were undecided and 2(14.2%) other respondents disagreed that special instructional materials would be very helpful in language expansion among stutterers. This findings are in line with the view of Farnsworth (2011) who asserts that teachers can help children who stutter by talking with the child privately and find ways to handle such students in the classroom.

As presented in table 4, 11(78.57%) teachers strongly disagree with the fact that helping the child make his/her own story book sung the technique is challenging while 1(7.14%) teachers were in agreement with the statement. Similarly, 9(64.2%) teacher strongly disagree that the childs' own book technique will not improve pupils fluency and self-esteem. However, 2(14.7%) teachers strongly agree with the statement. However, Mitchell (2011) is of the view that stuttering is not a problem with producing speech sounds and hence it should not affect the individual concerned negatively.

However, as shown in table 5, the posttest mean score of the experimental group is (60.00) while that of the control group is (40.00). The t - observed is (3.464) and the t - critical is (1.041). In addition, the mean difference for the experimental and control group is (20.00) which is significant. Therefore the null hypothesis that states that there will be no significant improvement in the language fluency of stutterers exposed to the Childs" Own Book Technique and those not exposed is rejected. Therefore, there is sufficient evidence to prove that the use of Childs" Own Book Technique significant has significant effect on the expansion of language fluency of stutterers.

As deduced from the above statement, the students exposed to Childs Own Book Technique performed better in the Stuttering Pupils Oral Test (SPOT) than those not exposed to the technique. The finding of this study is in line with the findings of Eckardt (2010) indicating significant improvement in the language fluency of stuttering students using techniques of this nature. In addition the students were able to pronounce

words that they were previously difficult to pronounce.

## RECOMMENDATIONS

Based on the findings of this research study, the following recommendations are therefore proffered:

1. Stuttering pupils often experience dis-fluency which affects their language skills. Therefore, childs' own book technique amongst other fluency shaping techniques should be used by teachers in expending language fluency.
2. There is need teachers to be able to assist stuttering pupils in their classroom through making improvisations such as the helping the child make a childs own story book to improve language skills.
3. It is also recommended that pupils requires considerable support and the teacher is expected to make every effort on the part of the teacher who in selecting appropriate methodology and materials to suit the individual needs of leaners in the classroom. This is aimed at making learning interesting, promoting active participation and bringing real life experiences as much as possible to learners with speech disorders or other forms of special educational needs.
4. The use of appropriate instructional materials is necessary to give primary school pupils the opportunity to access information that is not available to them in the classroom and also to enable them compete with their peers despite their special educational needs.
5. Teachers are encouraged to improvise and modify local materials that can easily be used in designing learning materials for primary school pupils in the classroom.
6. Further research should be carried out in the use of other fluency shaping techniques in expanding language fluency among stuttering pupils/students.

## CONCLUSION

It is necessary to conclude that there is sufficient evidence to prove that the use of Childs Own Book Technique significant has significant effect on the expansion of language fluency of stuttering pupils. However, children often are dis-fluent at this stage of vocabulary acquisition and language formulation. However, this affects a child's emotional or physical state (e.g. excitement, fatigue, illness) while talking, the length and complexity of the message the child wishes to convey and other factors that are more difficult to identify.

Therefore, there is need to use practical approaches such as the Childs Own Book Technique to manage stuttering just like any other difficulty a child may experience when learning a difficult task (e.g., learning to skip or ride a bicycle). Similar approaches should be taken with stuttering i.e. use their own style to encourage children who stutter and to build confidence about speaking.

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