
Effect of Communication Literacy Intervention (CLI) on Sign Language Knowledge (SLK) among Special Needs Deaf and Dumb College Students in Nigeria

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ABSTRACT

Communication is indispensable in human population. This study investigated the effect of communication literacy intervention (CLI) on sign language knowledge (SLK) among special needs deaf and dumb college students (SNDDCS) in Nigeria. The study adopted experimental research design involving a purposive sampling of 48 SNDDCS in Nigeria between March and June, 2021. The eligible participants were randomly assigned either in treatment (n=24) or control (n=24) group respectively. Only the participants in the treatment group were exposed to CLI manual while both groups participated in pre-posttest measures of sign language knowledge questionnaire -SLKQ with reliability index ($r=0.87$). The IBM SPSS version 22 was applied for all statistical computations. The results were deemed significant at $p \geq 0.05$. The findings showed that the participants in the treatment group recorded very high SLK scores in the posttest (80.6%) and follow-up (81.7%) measures when compared to the pretest low SLK score (46.2%), implying a significant increase in SLK. Statistically, significant differences were reported within demographic variables and intervals. Thus, no significant difference existed on gender ($p=0.090 > 0.05$) and location ($p=0.680 > 0.05$) while differences were observed on age by birth ($p=0.002 < 0.05$) and school type ($p=0.011 < 0.05$). Also, significant difference was observed on pretest ($p=0.001 < 0.05$) and follow-up ($p=0.010 < 0.05$) intervals while none was recorded on posttest measure ($p=0.061 > 0.05$). Therefore, the CLI has significant effect on SLK of SNDDCS in Nigeria. The adoption of language intervention such as CLI in special needs colleges is crucial in improving knowledge and use of sign languages by deaf and dumb students.

Keywords: sign language, CLI, knowledge, effect, SNDDCS.

I. INTRODUCTION

In human population, communication is an indispensable tool that plays significant roles such as enhancing interactions. Despite the prevailing 5% estimated population of deaf and dumb people worldwide, study indicated that a good number of them are ignorant of sign languages and thus, finding it very difficult to express their love and emotions to others [1]. Sign language is a system of communication, using visual gestures, signs made with the hands and other movements, including facial expressions and postures of the body [2, 3]. By implication, SL is the only reliable means of communication by deaf and dumb persons with others. The proper use of SL would enable the deaf and dumb persons to express themselves and communicate effectively with others in the surrounding. Experts in linguists consider both spoken and SL as types of natural language that emerged through an abstract, protracted aging process and evolved over time without meticulous planning [4]. Unlike SL, spoken language produces oral or vocal sounds which are commonly assimilated and internalized by the normal persons (those with no hearing or speech difficulties) in the environment. Surprisingly, SLs are not universally or mutually intelligible with each other, although literature posited that some striking similarities amongst them exist [5, 6]. Previously, study [5] considered SL as full-fledged natural language with its own grammar and lexicon, while other research referred to SL as spoken language, especially in contrast to written transcriptions of signs [7].

Communication literacy intervention –CLI is specifically validated to improve the level of sign language knowledge -SLK of special needs deaf and dumb college students -SNDDCS. The SNDDCS have a set of social belief, art, behavior, value, history, literary tradition, and shared institution that promote communication using SLs [8]. The SNDDCS use sign language (SL) as major means of communication and interactions with others within and out-of school settings. Literature defined this group of persons as humans at the deepest psychological level [1]. Specifically, the use of SL is a conventional means of teaching and learning in special needs colleges involving only the deaf and dumb students in Nigeria. These students are consistently exposed to various types and forms of SLs in order to improve their means of expression, communication, interaction and relationship with others. Some of these SLs are enlisted in the 2021 edition of Ethnologue [3] and the SIGN-HUB Atlas of Sign Language Structures [2]. The authors further entrusted that more SLs which are yet to be documented or discovered abound [2, 3].

Despite the increasing number of existing SLs for the deaf and dumb people worldwide, there is clear research evidence, indicating that deaf and dumb persons still possess poor knowledge or are totally ignorant of these SLs [1]. This has become a huge concern to language experts in particular due to the adverse consequences. Poor knowledge of SLs by deaf and dumb persons is often reflected on the limited manner of communication, expression of ideas and emotions and thus the need for a reliable intervention such as CLI. Relevant studies adopting health-related interventions had shown that interventions had significant effect in managing multiple psychosocial problems including distress, anxiety and depression [9-11]. The present study, therefore, investigated the effect of communication literacy intervention (CLI) on sign language knowledge (SLK) among special needs deaf and dumb college students (SNDDCS) in Nigeria and further tested the statistically significant difference with groups and intervals.

II. MATERIALS AND METHOD**Research design and recruitment procedures of participants**

This study adopted experimental research design involving a purposive sampling of 48 SNDDCS in Nigeria between March and June, 2021. Similar studies testing the significant effects of interventions on stress management and irrational beliefs [12], managing burnout symptoms [9], reducing occupational burnout [11], and controlling of emotional distress [10] had validated the authenticity of this design in research studies involving treatment and control groups as well as intervals of assessments and thus justified its adoption in the present study. All the study participants were gotten from special needs secondary schools in Nigeria by the researchers, after a-three weeks steady radio broadcast and structured awareness campaigns involving the use of fliers and posters. To further sensitize the public, the researchers sent official letter of notification to the school administrators of the special needs schools with strong emphasis on the crucial need to carry out the study. With the cooperation of the school authorities, there were massive indications by the students to enroll in the programme. This willful declaration of consents by the potential participants aided in the elimination of all possible sampling biases and thus facilitated successful enrolment in the programme.

Prior to full enrolment of the potential participants in the program, they were exposed to certain eligibility criteria as were stipulated by the researchers [10, 12]. Firstly, the person must be confirmed registered deaf and dumb student in one of the special needs colleges in Nigeria. Secondly, they must be willing to participate in the program from the start till the end. Thirdly, they must willfully fill the consent form without pressure or tension. Surprisingly, out of 249 students who indicated interest to participate, only 48 of them met the three stipulated eligibility tests. However, only the eligible participants were used to establish the significant effect of the intervention. Thus, all the 201 students who were excluded failed the eligibility tests. The randomized assignment of the 48 participants who survived the eligibility tests to either treatment (N=24) or control groups (N=24) was completed by the researchers. This was in accordance with the assertion of other researchers on the need for random assignment of participants into groups by the principal investigators [10, 13]. The CLI intervention manual was successfully applied only to the participants in the treatment group. Also, the participants in both groups participated in the pre-posttest measures using sign language knowledge questionnaire –SLKQ. The essence of exposing one group to the treatment intervention by the researchers was to establish the significant effect of CLI on SLK of the participants.

The communication literacy intervention (CLI) was compiled using simple English language. This is because English language is the official means of communication and teaching in special needs colleges in Nigerian. Also, the basic sign languages that commonly used in the schools were interpreted and translated using English language. The content of the intervention was structurally organized for easy implementation by facilitators. The implementation of the intervention in schools lasted for 12 weeks (twice per week) with two hours durations allotted to each group session. There was no obvious harm or hazard of any form recorded during the course of the intervention. The school environment as well as the classrooms served as the venue for the implementation of the program as agreed by the students, facilitators and researchers. There was complete maintenance of independent assessment of pretest, posttest and follow-up measures on the participants in the treatment and control groups. The raw data generated were totally blinded from both groups (experimental and control) and intervals (pretest, posttest and follow-up) until the final statistical analysis was completed. This was done in

order to control all possible statistical bias. The follow-up assessment was conducted after one month from the end of group program as suggested [14]. All the deaf and dumb students who participated in the intervention received token from the researchers as compasation and appreciation.

Research instrument

A researcher-based designed instrument titled “sign language knowledge questionnaire (SLKQ)” with a convincing reliability index of .87 was applied for all the interval assessments. The SLKQ was structurally designed based on a comprehensive literature review. The SLKQ is a self-reported questionnaire that allowed the researchers to enter data generated on sign language knowledge items in all the dimensions of sign languages assessed. The participants’ knowledge status was assessed using “yes” and “no” response options in a two-point scale.

Statistical analysis

The International Business Machine (IBM) SPSS version 22 [15] was adopted for all statistical computations with 100% data accuracy after a complete data cross-check. Also, all basic statistical assumptions were met. Frequency, percentages, and chi-square statistical tools were used for data analysis. The significant effect size of the intervention (CLI) was determined through mean percentage differences between groups and intervals. The pretest and posttest intervals of assessments were successfully completed by all the participants in both groups. All the statistical outcomes were deemed significant at $P \geq 0.05$.

Statement of ethics

The approval for the study was obtained from Research and Ethics Committee of University of Nigeria, Nsukka (REC/HKHE/19/00167). This was in line with the principles of the Declaration of Helsinki regarding studies involving human population [16].

III. Results

Table 1: Participants’ personal profile (N=48).

Demographics	Variables	N	Treatment Group f(%)	Control Group f(%)	Stat. P-value	Remarks
Gender	Male	23	11(48%)	12(52%)	0.032	0.090 NS
	Female	25	14(56%)	11(44%)		
Age by birth	≤15 years	21	11(52%)	10(48%)	0.142	0.002 S
	≥15 years	27	13(48%)	14 (52%)		
School type	Public	22	10(45%)	12(55%)	0.327	0.011 S
	Private	26	15(58%)	11(42%)		
Location	Urban	27	13(48%)	14(52%)	0.261	0.680 NS
	Rural	21	11(52%)	10(48%)		

Note: ()=bracket sign, Stats. = statistics, S = significant, ≤ = sign of less, %=sign of per cent, f =frequency sign, ≥ = sign of greater than, YSDE=years of service-delivery experience, NS = not significant difference, N=sample size..

Table 1 presented the participants’ personal profiles and further showed absolute compliance to the treatment intervention by the participants. The participants in the treatment group were 11(48%) males and 14(52%) females; and 12(52%) males and 11(44%) females in the control group, with no significant difference (stat. = 0.032; P-value = 0.090>0.05). There were 11(52%) participants below 15

years of age and 13(48%) of them who were 15 years and above in the treatment group; and 10(48%) of them who were below 15 years and 14(52%) of them who were 15 years and above in the control group, with significant difference (stat. = 0.142; P-value = 0.001<0.05). Also, there were 10(45%) participants from public schools and 15(58%) of them from the private schools in the treatment group; and 12(55%) participants from public schools and 11(42%) of them from private schools in the control group, with significant difference (stat. = 0.327; P-value = 0.011<0.05). Also, there were 13(48%) participants from urban areas and 11(58%) of them from rural settings in the treatment group; and 14(52%) participants from urban location and 10(48%) of them from rural location in the control group, with no significant difference (stat. = 0.261; P-value = 0.680>0.05).

Table 2: Analysis presenting the significant effect of CLI on SLK of SNDDCS and mean percentage differences within groups and intervals (N=48)

Intervals	Tool Groups	MPSMPD(Group)	Chi-square(χ^2)	P-value	Remarks
Pretest	SLKQ	Treatment 46.2 -3.1	87.216	0.001	S
		Control 49.3			
Posttest	SLKQ	Treatment 80.6 31.8	64.924	0.061	NS
		Control 48.8			
Follow-up	SLKQ	Treatment 81.7 35.2	74.443	0.010	S
		Control 46.5			

Note: SLKQ=sign language knowledge questionnaire, MPS=mean percentage score, MPD= mean percentage difference, S = significant, NS = not significant

Data in Table 2 presented the significant effect of CLI on SLK and the mean percentage differences within groups and intervals. The Table showed statistically significant difference on the mean percentage response scores of the participants in the treatment (46.2%) and control groups (49.3%) on SLK pretest, $\chi^2 = 87.216$, MPD = -3.1, P=0.001<0.05. Also, the Table recorded significant difference between the participants in the treatment (81.7%) and control groups (46.5%) on SLK follow-up scores, $\chi^2 = 74.443$, MPD = 35.2, P=0.010. Furthermore, the Table recorded no significant difference on the mean percentage response scores of the participants in the treatment (80.6%) and control groups (48.8%) on SLK posttest measure, $\chi^2 = 64.924$, MPD = 31.8, P=0.061>0.05. Also, the participants in the treatment group recorded very high mean percentage scores in the posttest (80.6%) and follow-up (81.7%) SLK assessment when compared to the pretest mean percentage score (46.2%). Also, the participants in the control group recorded high mean percentage scores in the pretest (49.3%) and lower mean percentage scores in the post test (48.8%) and follow-up (46.5%) SLK measures, indicating a decline in the sign language knowledge score. This implied that communication literacy intervention (CLI) had significant effect in sign language knowledge (SLK) of special needs deaf and dumb college students in Nigeria. (see Table 2).

IV. DISCUSSION

The present study investigated the effect of communication literacy intervention (CLI) on sign language knowledge (SLK) among special needs deaf and dumb college students (SNDDCS) in Nigeria and further tested the statistically significant difference with groups and intervals. The findings revealed that CLI has significant effect in improving SLK of SNDDCS. The expected finding is quite

encouraging and commendable. The outcomes of study were shown within groups (treatment and control) and intervals (pre-test, post-test and follow-ups). For instance, the participants in the treatment group recorded very high SLK scores in the posttest and follow-up measures when compared to the pretest low SLK score. This significant increase in SLK scores was attributed to the treatment intervention given to the participants in the treatment group. Our study therefore affirms that CLI is a reliable school-based intervention that is very effective in improving sign language knowledge of deaf and dumb students in colleges in Nigeria. Among the expectations of the researchers is that experts in linguists adopt similar interventions in rendering and delivering professional services to special needs deaf and dumb persons who solicit for such services. The study findings present some useful implications. For instance, communication interventions can improve the quality of knowledge regarding sign languages and further enhance interactions, relationships, expression of emotions, ideas, events and love by the victims. This is the basic for life-fulfillment and personal satisfaction. Secondly, the research strength of experimental studies is significantly demonstrated, showing that interventions can be applied in enhancing languages and communications. Thirdly, policy-makers can incorporate some segments of this study in existing policy or rather formulate new policies to accommodate the effectiveness of interventions in improving sign language knowledge for the deaf and dumb persons. The present study findings are in accordance with the reports of other scholars found significant effects of interventions and programmes in their respective studies [9, 12, 13].

Our study revealed statistically significant differences within demographic variables of age by birth and school type while no difference existed on gender and location. Also, within intervals, significant difference was observed on pretest and follow-up measures while none was recorded on posttest at $p \geq 0.05$. The findings are not surprising as they are also in accordance with results of other researchers [10, 11, 13, 14]. The strength of this study lies in the adoption of appropriate research design. There is need for future studies that would adopt mixed-design for effective research generalization. Highly recommended are the similar studies with varying methods of data collection such as interviews and focus group discussion.

V. CONCLUSION

The CLI has significant effect on SLK of SNDDCS in Nigeria. The adoption of language intervention such as CLI in special needs colleges is crucial in improving the knowledge and use of sign languages by deaf and dumb students

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