

## Factors Affecting the Learning of the Holy Quran among Severely and Profoundly Hearing-Impaired Children with a Cochlear Implant

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**Abstract:** The study aimed to examine three factors, namely self-factors, parental and teaching factors, which might affect the learning of the Arabic sounds used in the holy Quran among a group of Malay hearing-impaired children. This cross-sectional study involved fourteen severely and profoundly hearing-impaired children with a cochlear implant, aged between 8 to 15 years old, selected from those attending the Universiti Kebangsaan Malaysia Cochlear Implant Program. The duration of cochlear implant experience was between 5 to 10 years. All subjects used oral communication mode and attended normal mainstream schools. A set of questionnaires was adapted and subjects were interviewed directly to fill up this questionnaire. In addition, the children were also asked to read a surah in the holy Quran and these readings were rated by an expert in the recitation of the Quran. Bivariate Pearson correlation analyses revealed significant positive correlations between self-factors and teaching factors with the reading scores. However, parents' factors were insignificant. Stepwise multiple linear regression showed that self-factors were the only significant predicting factor and contributed about 55.1% of the variance seen in the reading scores suggesting self-factors were most significant to facilitate the learning of the holy Quran among hearing-impaired children with a cochlear implant.

**Keywords** - Cochlear implant, parents' factors, Quran learning, self-factors, teaching factors

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### I. Introduction

It is well established in the literature that cochlear implant (CI) is a powerful medical device that has helped people with severe-to-profound hearing loss to have more access to sounds as compared to the use of conventional hearing aids. In children, the use of cochlear implants early in life has helped many of them to develop speech and language skills that are almost comparable to normal hearing children [1-4]. Many were able to attend normal mainstream schools [5] and used auditory-oral communication mode. In Malaysia, the national curriculum also include Islamic education in which Quranic learning is part of it and this is a compulsory subject to all Muslim students. Despite the apparent ability to use spoken language, anecdotal report revealed that Muslim parents commented on the difficulties of their hearing-impaired children who were cochlear implant users to master the Quranic recitation. The present study aimed to examine three factors namely the self-factors, parental factors and teaching factors that might affect the Quranic reading and learning among hearing-impaired children with a cochlear implant.

Children in Malaysia as well as other non-Arabic countries learn the holy Quran for proper recitation during performing the solat or reciting prayers in our daily lives. It is the obligation of every Muslim to recite the holy Quran with authentic sound production and tajweed. The basic sounds of the holy Quran or the phonemes consist of 28 Arabic consonants with different voicing, manner and place of articulation cues. Some of the Arabic phonemes used in the holy Quran do not exist in the Malay phonology repertoire. This results in difficulties in producing these Arabic sounds among non-native Arabic speakers [6]. The first language of non-native Arabic speakers will influence their production of Arabic vowels and consonants [7]. This was also evidenced in a study by Nik Mohd. Rahimi et al., [8] in which 12 Arabic consonants were found to be moderately difficult and one consonant which was most difficult to produce due to the non-existence of this consonant in the Malay phonemic repertoire.

In a study on 320 normal hearing, secondary school students in Malaysia, it was found that many of the students were not able to recite the holy Quran up to a good standard in terms of its *fasahah* (fluency), *tajweed* (grammar) or melodic voice. They knew the basic Arabic letters used in the holy Quran (أ, ب, ت, ث, ج, ح, خ, د, ذ, ر, ز, س, ش, ص, ض, ط, ظ, ع, غ, ف, ق, ك, ل, م, ن, ه, و, ي) but could not read it fluently [9]. There are many factors that could contribute to this phenomenon including the attitude, interest and motivation of the individual-self, parents, teachers and teaching methods. This could be more so for hearing-impaired children who have poorer hearing sensitivity.

Several studies have shown the relationship between motivation and academic achievement [10-13] in various fields. Yusoff et al., [13] for example, examined the motivation of 824 secondary school children on learning Arabic and found a significant correlation between self-motivation and their academic performance in this subject (Arabic) at schools. Several studies have also demonstrated that parental involvement in education enhanced their children's academic achievement [14-16], most effective when parents engaged directly with their children's learning activities in the home [15]. Teachers' teaching method has also been found to affect the effectiveness of learning patterns and motivation among school children [10, 17]. In a study on 1651 Year 8 students from all over Malaysia on their perception of the effectiveness of teaching methods for the holy Quran learning in schools, they rated it as 'average' and that teachers need to be more creative to enhance the students' mastery of the subject [17].

In Malaysia, hearing-impaired children with a cochlear implant who attended normal mainstream schools will follow the same curriculum and teaching and learning methods for the Islamic education as their normal hearing peers. A study by Ishak et al., [18] revealed that even Islamic education teachers at the special schools for the deaf had lack of pedagogy and knowledge on teaching deaf and hard-of-hearing children. That study further revealed that the classroom environment, furniture and student arrangement were not comply with the needs of teaching and learning Islamic education for the hearing-impaired children. If the environment and teaching and learning methods used at the Special Schools for the Deaf were not favorable for teaching these children, this would be more so challenging for the hearing-impaired children attending the normal mainstreams even though they consistently use their cochlear implant device.

In addition to the above-mentioned challenges in school environment, cochlear implant users are known to show systematic deficits in recognition of consonant features especially place feature which relies heavily on spectral information. The Quranic teaching curriculum normally started with learning the basic Arabic letters or consonants used in the holy Quran in combination with vowel /a/. If they cannot perceive the consonant features correctly, the difficulties would be self-explained. Verschuur [19] pointed out that deficits in consonant recognition by cochlear implant users could be explained by the '*loss of phonemically relevant acoustic information in speech*' due to the nature of cochlear implant processing. Spectro-temporal distortions which occur at the interface between electrode array and auditory nervous system including cross-channel interaction could explained some of the difficulties faced by cochlear implant users in recognising consonants. Frequency-place shift due to placement of the electrode array in the scala tympani has also been shown to contribute to confusion of consonants among cochlear implant users in which voicing and place of articulation transmission varied with spectral shift and spectral resolution, while information transmitted for manner was affected only by spectral shift [20].

The factors mentioned above lead to the expected difficulties of children with cochlear implants to perceive the Arabic sounds through their implant device. However, they still need to learn reciting the Quran to carry out their daily duties as Muslims. As such, the study aimed to investigate several factors that could contribute or might affect their ability to learn proper recitation of the holy Quran. The purpose of this study was to examine three factors – namely self-factors, parental involvement and teaching factors -that might contribute to the holy Quran recitation performance of severely and profoundly hearing-impaired children who were CI users. The working hypothesis was that all the investigated factors would contribute in their learning of the holy Quran.

## **II. Methods**

### **2.1 Subjects**

This study involved 14 children who were cochlear implant users, recruited from the Universiti Kebangsaan Malaysia (UKM) Cochlear Implant Program. Subjects' age ranged from 8 to 15 years old with 5 to 10 years of cochlear implant experience. All subjects were Malay Muslims, used oral communication mode, attended normal mainstream schools and could recognize and read basic Al-Quran syllables and the *surah* in the holy Quran. Children who participated in this study were among those whom their parents had agreed to give their consent to participate.

### **2.2 Test material**

A questionnaire was adapted for the purpose of this study which consists of four main sections: A) demographic information; B) self-factors; C) parents' factors; D) teaching factors.

#### **2.2.1 Section A: Demographic details**

The background information collected here includes name, gender, age, years of education and highest level of parents' education.

#### **2.2.2 Section B: Self-factors**

This section measured the self-motivation, interest, self-improvement and self-initiated learning

practices of the holy Quran. It consists of 15 items with ten (10) positive items and five (5) negative items. An example of the positive items is *'The learning of the holy Quran is important to me'* and the example of the negative items is *'I have problem to produce and read the Quranic phonemes'*.

### 2.2.3 Section C: Parents' factors

Parental factors and involvement in their hearing-impaired children's learning of the holy Quran were quantified in this section. Section C consists of six (6) positive items. An example of the items is *'I encourage my cochlear-implanted child to learn the holy Quran'*. This section needs to be answered by the parents of the participating children with cochlear implants.

### 2.2.4 Section D: Teaching factors (from the children's perspective)

This final section assesses the children's perspective on the teaching strategy used by the Quranic teachers in their classrooms when teaching this subject. It consists of 14 questions with nine (9) positive items and five (5) negative items. An example of the positive items is *'My teacher gives more attention to me during the Quranic- learning class'* and the example of negative items is *'I feel bored with the style of teaching Al-Quran in the classroom'*.

Five-rating Likert scales are provided ranging from *Strongly Disagree (1)* to *Strongly Agree (5)* for subjects to indicate their responses to the questions in Sections B, C and D.

## 2.3 Test procedures

The study involved two phases: (i) adapting and validating the adapted questionnaire; and (ii) direct interview with the cochlear implant subjects and their parents using the validated questionnaire.

### 2.3.1 Phase 1: Adapting and validating the questionnaire

The questionnaire used was originally designed for another unpublished, local study which measure problems in producing and reading Arabic phonemes among Malaysian students (Lubis, personal communication). It consists of three sections that measure the relationships between Arabic education, teaching factors and other factors that might affect the production of Arabic phonemes among these students. For the purpose of the study reported here, this original questionnaire was shortened and adapted to be more relevant to the present study objectives. As mentioned in the earlier section of the test material, the adapted questionnaire has four main sections: A) demographic details; B) self-factors; C) parents' factors; and D) teaching factors. The adapted questionnaire was then given to six hearing-impaired children who were hearing aids users and their parents to check the appropriateness of the content of the questionnaire and clarity of the questions. The children involved in the pilot study aged within the chronological age range of the children with cochlear implants identified for the real study. Items were improved and reorganized following the feedback obtained from the pilot study.

### 2.3.2 Phase 2: The real study

At the beginning of this study, 16 children with a CI who fulfilled the inclusion criteria were invited to participate but two subjects left the study due to other family's commitment. Thus, the validated questionnaire was administered only to 14 children and their parents and included in the analyses. Nine parents and their participated children were interviewed directly (face-to-face) when attending their regular clinic appointments while five parents and their children were interviewed via telephone as two of them received the questionnaire by mail and another three children received the questionnaire by electronic mails.

To assess the ability of the children with cochlear implants to read the holy Quran as a measure of their achievement in learning the Quran, the children were asked to recite *surah Al-Fatihah* from the holy Quran. All readings were recorded using the Sony IC recorder (ICD-SX850- with low cut frequency function, pre-recording and limiter functions) for later analyses. The readings were rated by an expert in the holy Quran recitation.

## 2.4 Data analyses

To assess the reliability of the adapted questionnaire, the Cronbach Alpha statistic was used. An alpha value of more than 0.7 would be considered as reliable and acceptable to be used [24]. The negatively worded items were re-coded and reversed scorings were used in the analyses. The mean score for each item was further classified according to Ehrman & Oxford [21] as *high* (3.50 – 5.00), *medium* (2.50 – 3.49) and *low* (1.00 – 2.49).

Data in the real study were analyzed using the bivariate Pearson correlations to investigate which of the three factors studied showed significant correlations with the scores in Al-Quran recitation. Significant factors were then submitted for a multiple linear regression analyses to determine the strongest factor contributing to the learning of the Al-Quran among the subjects. The significance level accepted was at the 5% level.

2.5 Ethical consent

This study was approved by the Universiti Kebangsaan Malaysia (UKM) Human Ethical Committee to be conducted on human subjects starting from July 2010 to April 2011. However, the data collection for the study reported here was from November 2010 to January 2011. Consent forms and information sheet for parents regarding the study were distributed before the children participated in this study.

### III. Results

3.1 Reliability of the adapted questionnaire.

An alpha value of 0.796 was obtained indicating that the questionnaire was reliable and acceptable to be used in this study.

3.2 Overall mean scores for each domain

The overall mean score for self-factors was 3.23 with a 0.23 standard deviation, which was classified as medium. For parents' factor, the overall mean score was high that was 4.50 with a 0.31 standard deviation while the mean score for teaching factors was also medium which was 3.42 with a standard deviation of 0.20.

3.3 Individual items' mean scores

Table 1 yields the mean scores of the items for each investigated domain across all subjects. It could be seen here that the highest mean score for the self-factors' domain was 'I recognize basic Al-Quran syllables' while the lowest score was 'I have problem to produce and read the Quranic phonemes'. For the parents' factors, the highest mean was 'Quranic education is as important to my hearing-impaired child with a cochlear implant as my other normal hearing children'. The children as a whole rated 'My teacher uses simple language during the Quranic- learning class' and 'My teacher uses clear voice during Quranic teaching' as the highest score for the teaching factors.

Table 1: The mean scores and standard deviations (SD) for each item in the three domains: A) Self-factors; B) Parental factors; and C) Teaching factors. The items with \* indicate negative items.

Items	Mean rating	SD
<b>A) Self-factors</b>		
I recognize basic Al-Quran syllables	<b>4.64</b>	0.50
The learning of the holy Quran is important to me.	4.43	0.51
I read Al-Quran at home.	4.36	0.63
I always read known <i>surah</i> during performing the solat.	4.21	0.58
I am interested in the Quranic subject.	4.14	0.53
I always ask teacher/ parents if having problem during the holy Quran reading.	3.79	0.89
*Reading the holy Quran give pressure and burden me.	3.36	0.93
I watch Quranic education programmes on television to improve the Quranic recitation.	3.14	1.17
I know Al-Quran phonemes have different voicing, manner and place of articulation cues	3.14	1.17
* I learn the holy Quran to pass the examination only.	2.93	1.14
*The television programmes are more interesting than Quranic teaching materials.	2.43	0.65
I learn the holy Quran by searching internet and watching Quranic VCD.	2.43	1.28
*I learn the holy Quran because my parents/teachers ask me to do so.	2.00	1.20
I participate in the religious activities such as tadarrus al-Quran, nasyid, calligraphy writing and others.	2.00	1.41
*I have problem to produce and read the Quranic phonemes.	<b>1.86</b>	0.77
<b>B) Parental factors</b>		
Quranic education is as important to my hearing-impaired child with a cochlear implant as my other normal hearing children	<b>4.93</b>	0.27
I encourage my cochlear implanted child to learn the	4.79	0.43

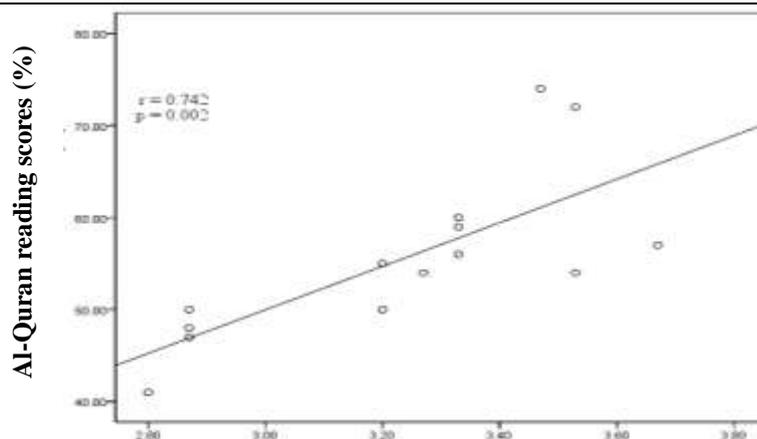
holy Quran.		
I send my cochlear implanted child to Quranic-learning class.	4.57	0.65
I feel disappointed if my cochlear implanted child fail in the Al-Quran subject.	4.57	0.65
I am willing to provide internet for my cochlear implanted child to learn Al-Quran.	4.43	0.85
I teach my cochlear implanted child read the holy Quran at home.	3.71	0.99
<b>C) Teaching factors</b>		
My teacher uses simple language during the Quranic-learning class.	<b>4.36</b>	0.63
My teacher uses clear voice during Quranic teaching.	<b>4.36</b>	0.74
My teacher gives Al-Quran reading training to me in the classroom.	4.29	0.47
My teacher always repeats his/her Quranic reading during the Quranic-learning class.	3.93	1.00
My teacher encourages me to participate in the Quranic-learning activities.	3.93	0.92
My teacher always asks me to read Al-Quran during the Quranic-learning class.	3.79	0.80
I understand the Quranic learning in the classroom.	3.71	0.61
*I feel bored with the style of teaching Al-Quran in the classroom.	3.50	1.16
My teacher gives more attention to me during the Quranic-learning class.	3.36	0.74
My teacher varies the Quranic teaching method to attract the student.	3.36	1.00
*My teacher uses the holy Quran/ iqra'/textbook only during the Quranic-learning class.	2.64	0.84
*My teacher does not have 'question and answer' session during the Quranic-learning class.	2.29	1.27
*I have difficulties to focus on Al-Quran learning in the classroom.	2.21	0.89
*The tv programmes/internet/games are more interesting than Quranic teaching methods.	2.07	0.92

### 3.4 Correlation and multiple linear regression analyses

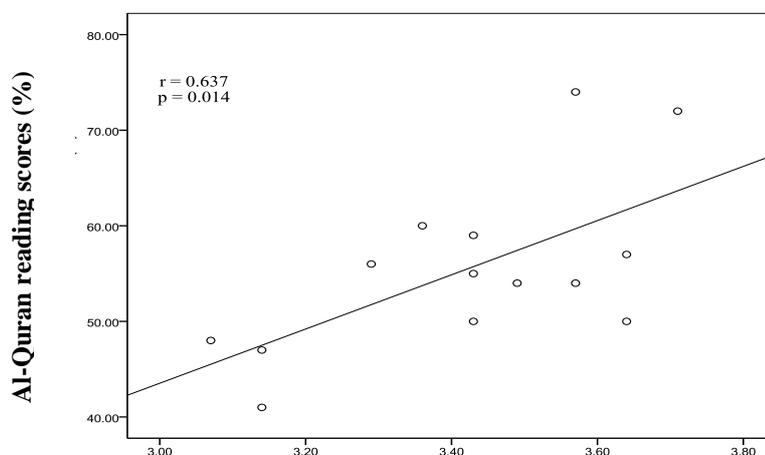
Bivariate Pearson correlation analyses revealed significant positive correlations between self-factors ( $r=0.742$ ,  $p=0.002$ ) and teaching factors ( $r=0.637$ ,  $p=0.014$ ) with the scores of the *Al-Fatihah* recitations. However, parental factors were insignificant ( $r=0.085$ ,  $p>0.05$ ). Fig. 1 (a) and (b) show the scatter plots of the relationships between self-factors and teaching factors, respectively, with the Al-Quran recitation scores.

Subsequently, the self and teaching-factors were submitted for the linear regression statistics. Stepwise multiple linear regression revealed that self-factors were the only significant predicting factor [ $F(1, 13) = 14.718$ ,  $p=0.002$ ] and contributed about 55.1% of the variance seen in the scoring of the holy Quran's recitation. The regression model was as followed:

$$\text{The recitation scores} = -20.953 + 0.742 (\text{Self-factors}) + 0.233 (\text{Teachings factors}) \quad (1)$$



a) Mean scores for self-factors



b) Mean scores for teachings-factors

**Figure 1: Scatter plots showing (a) the relation between self-factors and Al-Quran reading scores; and (b) the relation between teaching-factors and Al-Quran reading scores**

#### IV. Discussion

The study aimed to examine three factors-namely the self-factors, parental factors and teaching factors-that might contribute to the Al-Quran learning of severely and profoundly hearing impaired children with a cochlear implant. These factors were chosen as they were considered as the closest factors or had strong influences on a child’s ability in learning [13-14, 17]. The ability to acquire good Quranic recitation skills is an important goal for all Muslims including hearing-impaired children with a cochlear implant who have acquired oral communication skills following intensive therapy post-cochlear implant surgery. From the correlation analyses, self-factors and teaching-factors (as seen from the children’s perspectives) emerged as significant factors. However, the multiple linear regression analyses revealed that self-factors were the only significant predicting factor contributing to about 55.1% of the variance seen in the ability of the children with cochlear implants in reciting the Quran when these two factors (self- and teaching-factors) were considered together. It was observed from Table 1 that subjects in general indicated their interest in Quranic learning was relatively high (mean: 4.14) and high realization of the importance of learning Al-Quran (mean: 4.43) [21-22] that could have been their internal motivation to master the Quranic recitation. Even though they could recognize the basic Al-Quran phonemes (mean: 4.64), the subjects admitted their difficulties in producing these phonemes, as reflected by the low mean score of 1.86 [21-22]. In order to overcome these difficulties, the subjects indicated that they asked their parents and teachers to improve their readings (mean: 3.79) and continue improving their recitations in the prayers (mean: 4.21). The results suggest that despite the expected difficulties among children with cochlear implants in perceiving speech sounds not familiar to their language repertoire through their hearing device, the ‘inner push’ within themselves and the positive attitude towards the learning of the holy Quran set them apart. This result supported the findings from many other studies that examined motivation and academic achievement [10-11, 23]. According to Tella [23] for example, who studied the impact of motivation on students’ achievement in Mathematics in Nigeria, students with high motivation showed better academic

performance compared to their lowly motivated peers. Their positive attitude and interest towards the learning process could be the source of motivation for a better achievement in the class or in their lives in general.

The bivariate correlation analyses suggest that the subjects' perception on the teaching factors significantly correlated with their Quranic reading performance. The result partly support the findings by Noh and Tarmizi [17] who surveyed on 1651 normal hearing students on their perspectives on the Al-Quran teaching and learning methods used at schools throughout Malaysia. The authors concluded that teachers need to enhance their creativity in the teaching of this subject to ensure the delivery of the subject to the students and increase their mastery of the skills of reciting the holy Quran. Implementing appropriate approach to stimulate learning process is crucial since none is considered as the best approach for a given subject for all students in all conditions. It is thus hypothesized that effective Quranic teaching strategies will help to improve the level of interest of all children including the children with the cochlear implant to improve their ability to properly recite the Quran. In the present study, when subjects were asked whether their teachers varied their teaching techniques to attract students' attention in the class a mean score of 3.36 was obtained suggesting on average subjects were less agreed to this statement. However, the subjects in general agreed that the teachers used clear voice (high mean score of 4.36) during the teaching that facilitate the learning process.

Unexpectedly, our study found no correlation between parental factors and the children's ability to recite the Quran as the indicator of their achievement in Al-Quran learning. This result was in contrast with several other studies that show significant parental factors and academic attainment [14-15, 24-25]. Almost all parents who participated in this study strongly agreed (mean score 4.93) that the Quranic education was as important to their hearing-impaired child as was to their normally-hearing siblings. The fact that they scored equally high to all the other items in Section C (mean overall score of 4.50 for this section) advocated that parents, at least in this study, realized the importance of these hearing-impaired children to learn the Quran despite their limited hearing sensitivity. The parents admitted in general that they worried if their children failed the Islamic education subject at school (mean score 4.57) and thus, sent their implanted children to an additional learning classes outside the school for better Quranic education (mean score 4.57). Hence, the insignificant correlation obtained indicates that all items asked in this study were equally important to the parents to support the learning of Al-Quran to their cochlear-implanted children and to ensure equal opportunities to these children to learn as for their hearing siblings.

## **V. Conclusion**

The limitation of the study was the relatively small sample size. The results obtained from small subjects will be more easily influenced by the variation between individuals. However the results give some early information on how children with cochlear implants who are non-native Arabic speakers learn to master the recitation of the holy Quran that uses Arabic. Besides, there were only three factors investigated. Future studies should take into account other factors such as peers, socioeconomic factors, mass media or teachers' perspectives themselves on teaching these special children alongside their normal hearing peers that may affect Al-Quran learning among prelingually deaf children who use cochlear implants.

In conclusion, self-factors were most significant among the three factors studied, that might contribute to the mastery of Al-Quran recitation among severely and profoundly hearing-impaired children with cochlear implants who attended normal mainstream schools. Thus, preparing stimulating environment that could instill or further enhance these children's motivation to learn Al-Quran to the best of their hearing ability using their hearing devices should be facilitated.

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