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## **Study on Verifying the Effectiveness of Non-face-to-face Youth Volunteering in Improving Self-Esteem among Children of Deaf Adults (CODAs)**

### **Doyeon Won**

Sungkyungwan University Social Welfare Research Lab, Seoul, South Korea  
hoper80@skku.edu

### **Seoyoon Eunice Yang**

Seoul International School, Seongnam-Si, South Korea  
Yoonseo.yang0318@gmail.com

### **Christine Seojin Yi**

Seoul International School, Seongnam-Si, South Korea  
christine.yi22@stu.siskorea.org

### **Jeongwoo Brian Cho**

Seoul International School, Seongnam-Si, South Korea  
jeongwoo.cho23@stu.siskorea.org

### **Alex Kim**

Seoul International School, Seongnam-Si, South Korea  
alex.kim23@stu.siskorea.org

### **Alyssa Seo Eun Lee**

Seoul International School, Seongnam-Si, South Korea  
alyssa.lee24@stu.siskorea.org

### **Alexis Joonhee Choi**

Seoul International School, Seongnam-Si, South Korea  
alexis.choi24@stu.siskorea.org

**Abstract.** The goal of this study is to evaluate the effectiveness of youth volunteering in increasing the self-esteem of hearing children of deaf adults (CODAs), who commonly start taking care of their parents from a young age. To this end, an experimental study based on the non-equal comparison groups design was applied to a experimental group of 4 participants and a control group of 3 participants, selected based on the recommendation from expert social workers from the M General Social Welfare Center in P City. The volunteer programs, conducted non-face-to-face due to COVID-19, were centered on art activities such as drawing one's own dreams, decorating flowers, and customizing pencil cases. Repeated measures analysis of variance (rANOVA) was conducted to verify the effectiveness of volunteering, and the analysis results are as follows. First, in both the experimental group and the control group, CODAs' self

esteem increased after the program was carried out. Second, while the growth effect appeared in both groups, the slope of increase in the self-esteem of the experimental group was significantly higher than that of the control group. Accordingly, the effectiveness of volunteering to improve CODAs' self-esteem was verified. This study suggests academic and practical implications based on these findings.

**Keywords.** Volunteer service, hearing children of deaf adults, CODAs, self-esteem, non-face-to-face volunteer

## 1. Introduction

Self-esteem, defined as the sense of trust and affection with others, is especially crucial for school-aged children. It is used as an index to represent ego identity, which influences the sense of trust with others and acquisition of emotional stability (Kim, 2013). Children with high self-esteem are active and expressive, and, therefore, have confidence, competence, and sense of accomplishment when engaging in social relationships. On the other hand, those with low self-esteem are characterized by a sense of uncertainty, inferiority, helplessness, low achievement, and the possibility of misconduct and deviation. (Jang, 1995; Chung et al., 2011; Kim, 2013; Rosenberg, 1965). Some studies have also shown that children's self-esteem shows significant correlation with amicable friendship (Lee, 2017) and reported that it has positive effect on their happiness and adaptation to school life (Kim, 2014; Lee, 2017).

Non-disabled children of disabled parents generally show lower self-esteem than those who belong to non-disabled parents. From a very young age, these children encounter numerous difficulties as they perform as 'young carers' to assist their parents. These young carers suffer from various social and emotional influences that include internal and external pressures to care for their parents and social stigma on disability, and loss of self-esteem is one of the most common symptoms (Kim and Kim, 2013; Kim, 2015; Banks et al., 2001; Lackey and Gates, 2001; Sahoo and Suar, 2009). Although hardships during childhood may eventually create new opportunities for growth and change over time (Lackey and Gates, 20001; Sahoo and Suar, 2009), this long-term effect manifests only after childhood. As such, self-esteem is a critical factor for school-age children with disabled parents, which influences their adaptation to school life and happiness (Kim, 2014; Lee, 2017).

Unlike other children of parents with disabilities, hearing children of hearing-impaired parents use both sign languages and spoken languages, and thereby embody unique social identities associated with the dual culture formed between hearing-impaired communities and non-disabled communities. Subsequently, they experience psychological, social, and verbal difficulties as they grow. (Lee and Kim, 2011; Lee, 2013; Woo, 2015; Bishop and Hicks, 2005; Knight, 2018). According to *2017 Survey on the Actual Conditions of the Disabled*, hearing impairment is the second most common disability among the registered disabled population in South Korea. Among married hearing-impaired people, in 75.9% of the cases where the spouse had a disability at the time of marriage, the spouse had the same hearing impairment.<sup>1</sup> 96.9% of the hearing impaired people with a spouse have children, and 94.5% of these couples have non-disabled children. Therefore, it may be assumed that there are significant number of cases where hearing-impaired parents have non-disabled children.

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<sup>1</sup> It is relatively rare for the both sides of couples to have disabilities. In 2017 Survey on the Actual Conditions of the Disabled, 97.6% of the responders with disabilities replied that their spouses are non-disabled. However, it should also be noticed that 77.3% of the responders replied that they did not have disabilities at the time of marriage. Yet, the data does not show the respective percentages of disabled populations with disabled spouses and with non-disabled spouses, that had disabilities at the time of marriage.

However, few previous studies adequately address such issues. Domestic researches on hearing-impaired parents are commonly centered around the parents' perspective in nurturing children, focusing on their parenting burden and experience (Park, 2000; Park, 2002; So, 2004; Lee, 2010). It can be understood that these studies do not fully consider issues concerning the lack of self-esteem in the children. Several studies that focus on the position of non-disabled children with disabled parents do not isolate cases of hearing disabilities but rather target a broader population of children with parents with various disabilities. These studies fail to specifically deal with the characteristics of non-disabled children of hearing-impaired parents. (Chong, 2012; Kim and Kim, 2013; Kim, 2015). Studies that do target this specific population overcome such limitations, but their focus is on the linguistic aspects regarding the children's bimodal bilingualism, not the matter of their self-esteem (Lee and Kim, 2011a; Lee and Kim, 2011b).

One notable study conducted by Kim (2013) successfully overcame these limitations of previous studies. The main conclusion of the study is that the communication between the parents and children, parenting attitudes, and peer relationships directly affect the children's self-esteem. However, it is also mentioned that the strong bond between parents and children (Oh, 2011), dedication and love of parents, and compassion (Lee, 2004), make it relatively easy to seek an improvement in parenting attitudes and parental communications, while in peer relationships, children still experience teasing and bullying due to their parents' disabilities (Lee, 2004; Oh, 2011).

In improving self-esteem for hearing children of hearing-impaired parents, youth volunteering can be an efficient approach. Volunteering serves to solve social problems, extend the social welfare sector to the private sector, and access the blind spots of social welfare (Lee et al., 2017). These functions make volunteering suitable for approaching this particular societal issue. Also, spending time with teenagers rather than adults increases the potential to improve self-esteem. Given such, this study has set up the following research question.

Research Question: Can youth volunteering programs improve the self-esteem level in hearing children of hearing-impaired adults?

## **2. Theoretical Argument**

### *2.1. Self-esteem*

The paragraph text follows on from the subsection heading but should not be in italic. Self-esteem refers to the cognitive and emotional state of mind in which one respects oneself and evaluates oneself as worthy and valuable. (Rosenberg et al., 1995). In educational psychology, self-concept is a collection of beliefs about the values that define oneself, while self-esteem is one's emotional response to the evaluation on these values. (Korean Educational Psychology Association, 2001). In other words, whereas one's self-concept "distinguishes one's identity from others", self-esteem is "the value that an individual connects to that sense of identity" (Song, 2011).

Self-esteem has the following characteristics. First, assessment of self-esteem should be based on continuous evaluation, and should avoid focusing on temporary changes during the evaluation. Second, self-esteem is influenced by experiences and roles pertaining to gender, age, etc., and varies with circumstantial influences of family, friends, oneself, and social activities. Third, evaluation of one's self-esteem, in itself an act of self-evaluation, can be a conscious process. In other words, in the process of such self-evaluation, one's actions, abilities, and attributes are evaluated according to one's own standards (Cha, 1997; Song, 2011).

The importance of self-esteem in school-aged children is apparent in Coopersmith's description of self-esteem (1967): those with high self-esteem are confident in their perception and judgment; they are open to expressing their views and opinions; their ways of self-expression are clear and energetic; they actively participate in group discussions; they easily approach others and form new relationships; they assess situations more acutely and are able to process information more easily and effectively; since they have relatively fewer stereotypes about themselves, they use more flexible cognitive pathways in drawing information. These traits continue into adulthood and constantly affect their lives. It is also reported in a domestic studies that children's self-esteem plays an important role in friendship (Lee, 2017), happiness, and school-life (Kim, 2014; Lee, 2017).

## 2.2. *Characteristics of CODAs*

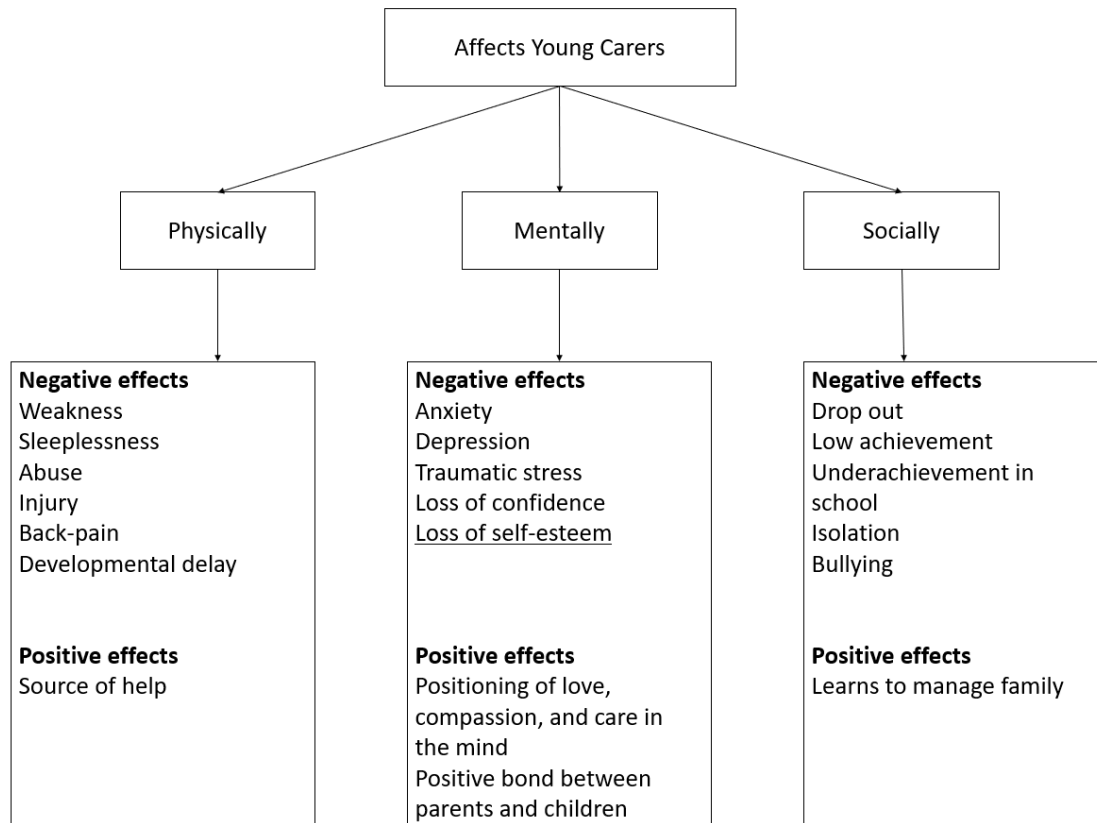
Difficulties arising from disability is generally shared by the entire family (Kim and Kim, 2013). In particular, children of parents with disabilities can experience negative psychological influences from young age, and as they take on the role of young carer to help parents with disabilities, such psychological influence is likely to continue on to adulthood (Lackey & Gates, 2001; Newman, 2002). Commonly, these children are in charge of various household chores, emotional support, medication, mobility of the parent, and personal hygiene (Dearden and Becker, 1995; Dearden and Becker, 1998; Newton and Becker, 1999).

Young carers refer to children of age 18 or younger who provide support and assistance at home to parents, grandparents, siblings, or other family members with illness, disabilities, infections, addictions, psychological distress, and more (Sahoo and Suar, 2009). Sahoo and Suar (2009) modeled the effects of being a young carer in <Figure 1>.<sup>2</sup> As demonstrated in the figure, being a young carer does come with certain positive benefits; it can be a rewarding experience

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<sup>2</sup> Sahoo and Suar (2009) not only present the consequences of being a young carer but also the causes, which include chronic illnesses, substance abuses, and mental illnesses of the parent. Since the general definition of young carer is not limited to non-disabled children of disabled parents but encompasses the entire young population that supports a family member with certain difficulty, such causes are applicable. However, because this study focuses specifically on the non-disabled children of parents with hearing impairments, the causes were excluded from the diagram.

that teaches them the value of love and sympathy, responsibility, and maturity. However, compared to the negative effects, the benefits are thin on the ground.



**Figure 1.** Positive and negative influences on young carer

\*Source: Sahoo and Suar (2009) p. 143

Having to take care of their parents and receiving less care from them, young carers are negatively influenced in terms of physical state; they are weaker, slower in development, and often neglected. Lack of parental care can also lead to depression, anxiety, and attention deficits, which in turn leads to psychological consequences including lower self-esteem. In terms of mental state, young carers often experience isolation due to neglect and bullying, and the deeply-rooted dissatisfaction can lead to misconduct or aggression towards others. They show poorer academic performances and considerably more dropouts. A study in Korea (Kim, 2015) reported that parents' disability negatively affects children's psychological state and that it brings about a lack of social skills at a relatively young age, which demonstrates the seriousness associated with low self-esteem among school-aged children.

Hearing-impaired parents' children are academically called Children of Deaf Adults (CODAs) or Kids of Deaf Adults (KODAs). They also exhibit the characteristics of general young carers (Lee and Kim, 2011; Blatt, 2007; Knight, 2018). They mature at an early age and become adult-like (Mi-Sun Lee, 2013). Early maturity, referred to as “adultification”, can be attributed to the role of the young carer. According to Sahoo and Suar (2009), the burden of protecting their parents and the concomitant anxiety enable CODAs to learn the value of love,

empathy, and responsibility. However, they experience neglect from the parents's care (Lee 2013). Another research (Woo, 2015) pointed out externalization problems in which CODAs externalize social withdrawal, or avoidance of social contact, and offensive behaviors.

One distinctive characteristic of CODAs is bilingualism (Lee and Kim, 2011; Filer and Filer, 2000; Singleton and Tittle, 2000; Knight, 2018). CODAs play a role in communication between hearing impaired parents and hearing society, which encompasses both the translation of languages and the translation of cultures (Filer and Filer, 2000). Hearing impaired communities share unique cultures distinguishable from non-hearing impaired communities (Filer and Filer, 2000; Singleton and Tittle, 2000; Knight, 2018), and CODAs experience difficulty adapting and belonging to either communities, which leads to identity crisis.

### *2.3. Possibility of improving CODAs' self-esteem through virtual volunteering*

Through the consideration above, it can be noticed that CODAs have relatively low self-esteem and that it is necessary to improve this situation. Youth volunteering can be considered as a way to address this issue.

At the World Volunteer Conference held in Amsterdam in 2001, International Association for Volunteer Effort (IAVE) made the following argument as they revised and reissued 'The Universal Declaration on Volunteering'. "*Volunteering is a fundamental building block of civil society. It brings to life the noblest aspirations of humankind — the pursuit of peace, freedom, opportunity, safety, and justice for all people.*" (International Association for Volunteer Effort, 2020, p. 1) Volunteering activities are crucial as IAVE declares. Definition of volunteering varies between countries, and even in one country, different organizations may have different views on how to define it. However, based on the general opinions of various countries, organizations, and scholars, volunteering can be defined as 'activity beneficial to the society and others that is performed without material compensation and is solely based on one's voluntary intent' (Lee et al., 2017).

Volunteering activity brings various positive impacts on personal, social, and global level. For volunteers, it offers opportunities to make good use of one's spare time and for self-realization, education, and maturity. On the social level, it addresses social problems, extends social welfare to the private sector, and increases social capital. Lastly, on the global level, volunteering is necessary for global governance concerning environment, human rights, war, and etc. (Lee et al., 2017).

Addressing the issue of CODAs' low self-esteem connects to tackling the blind spots of the social welfare system which has been conventionally centered on disabled parents. As shown in the previous study (Kim, 2013), CODAs' self-esteem improves with better relationship with same age group. Therefore, it can be inferred that youth volunteering can effectively increase CODAs' self-esteem by expanding their interpersonal relationships and improving their relationships with same age group.

COVID-19 situation has prevented traditional face-to-face volunteer activities. In 2019, before the first COVID-19 patient was confirmed in South Korea, the number of volunteers amounted to 29,129,700. In 2020, this number was reduced into 13,994,115, almost half of the previous year (1365 Volunteer Portal, 2021). Granted, COVID-19 is not the only cause of such decrease. However, various regulations including social distancing have certainly hindered face-to-face volunteer activities.

With such difficulties, virtual volunteering can be an alternative. Virtual volunteering amplifies the flexibility of volunteer activities as it is far less restricted by time and space (Murray and Harrison, 2002). A highly wired nation, South Korea provides optimal environment for virtual volunteer activities (Kim, 2005; Lee et al., 2017).

Art activity is one of the plausible non-face-to-face volunteer programs that can help improve CODAs' self-esteem. Previous studies in Korea show that group art therapy has helped improve self-esteem of abused children (Cho and Oh, 2017), children from low-income households (Seo, 2010), children from divorced families (Kim, 2004), as well as general elementary school students (Yoo and Han, 2015). However, it is difficult for youth volunteers to carry out professional art therapies and COVID-19 situation precludes face-to-face group activities. Therefore this study designed cooperative art activities based on small groups in which participants draw, create, and decorate, and then share opinions about the theme of each work and the methods applied.

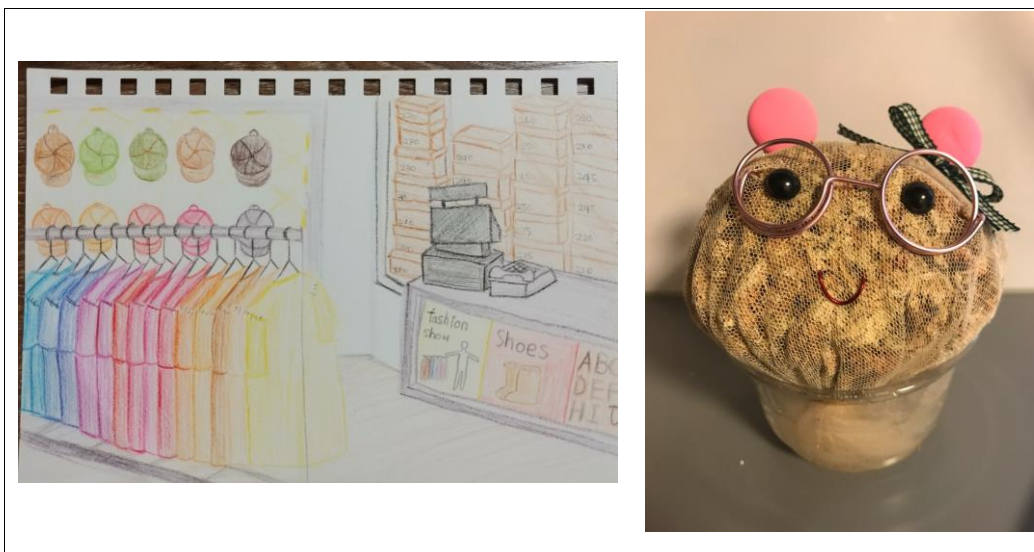
### 3. Research Method

#### 3.1. Experimental Study

Twelve members of the volunteer club at S School, located in Kyung-gi-do conducted virtual youth volunteering for CODAs. At the end of July in 2020, six CODAs were selected by expert social workers from the M general social welfare center located in P city. Afterwards, non-face-to-face training was provided to volunteers, through which they learned the characteristics of CODAs, how to perform virtual volunteer programs, and how to set up the schedules. Volunteer programs were planned two times per week for a month starting August.

With far less restrictions on time and place, the program was proceeded with greater flexibility in comparison to in-person volunteer works. Members of volunteer groups and CODAs were divided into small groups, and the timeline for the volunteer work was adjusted depending on the conditions of each group members' schedule. Physical distance existed as CODAs lived in P city, Gyeonggi-do, while all of the volunteers lived in Seoul. Despite the distance, non-face-to-face volunteer work could be conducted flexibly with little time and place restriction.

As described above, the program focused on art activities based on the previous studies that showed self-esteem increased through art activities (Kim, 2004; Seo, 2010; Park, 2012; Yoo and Han, 2015; Cho and Oh, 2017). Specifically, volunteers and CODAs started with introducing themselves and sharing about their dreams for the future, and then conducted activities including making flowers, painting dreams, making frames and pencil cases, and playing online video games.



**Figure 2.** Several artworks from CODAs program



Six CODAs recommended and twelve volunteers were organized into six groups in a one-to-two ratio. One-group pretest-posttest design was planned, where each group would take a pre-test and a post-test throughout the program. Two CODAs, however, could not participate in the program due to difficulties in using Zoom, the video-calling program. Therefore, the program was conducted in four groups in a one-to-three ratio, and the four CODAs who participated in the program formed an experimental group. Another potential CODA was recommended just before the start of the program, but they were unable to join the program in the end. As a result, an experimental group consisted of four CODAs who joined the program and a control group consisted of the other three CODAs. The research followed the nonequivalent comparison groups design, a quasi-experimental design without random sampling (Rubin and Babbie, 1989).

O<sub>1</sub>      X      O<sub>2</sub>    : experimental group  
O<sub>1</sub>           O<sub>2</sub>    : control group

**Table 1.** Research Procedure

Research Period	Research Procedure
7. 13. ~ 7. 21.	1) Selection of eligible CODAs
7. 25.	2) Pre-training for volunteers
7. 27.	3) Orientation <sup>3</sup> and Pre-test
8. 3. ~ 9. 5.	4) Initiate program
9. 7. ~ 9. 11.	5) Post-test

### 3.2. Measurement scale and analysis methods

To measure self-esteem, this study used the Rosenberg Self-Esteem Scale (RSE) (Rosenberg, 1979). The RSE has received more empirical validity than other self-esteem measures (Robins et al., 2001). This scale was originally designed for measuring high school students' self-esteem and its use has since been expanded to various groups. The scale consisted of 10 questions with a response category consisting of “strongly disagree”, “disagree”, “agree”, or “strongly agree” with a 4 point Likert Scale. The scale of Oh (2001), which translates the original scale in English into Korean, was queried with the study participants. Five questions<sup>4</sup> stated negatively were scored in reverse and then scored as a simple sum of individual 4 points. As the reliability of RSE, Cronbach’s  $\alpha$  value in the study of Oh (2001) was found to be .73, and it appeared to be .86 in this study.

In this study, the effectiveness of the volunteer program was verified by measuring the difference of the self-esteem of the experimental group and the control group before and after

<sup>3</sup> Orientation meeting was held in M General Social Welfare Center. Due to COVID-19, social distancing between participants was strictly observed and only a limited number of volunteers and social workers attended the meeting wearing masks. All CODAs attended the meeting, each with a guardian.

<sup>4</sup> “All in all, I am inclined to think that I am a failure.”; “I feel I do not have much to be proud of.”; “I wish I could have more respect for myself.”; “I certainly feel useless at times.”; “At times I think I am no good at all.”

the program. SPSS WIN ver. 23 Statistical Package was used for this analysis and Repeated Measures Analysis of Variance (rANOVA) was applied as the analysis method. To test for pre-post differences in the interval measures including RSE, t-test (verification of pre-post difference in a group) or one-way ANOVA (Simultaneous comparison of pre-post means of multiple groups) are commonly used. However, these analysis methods that assume normality, are not suitable for studies with a small number of cases.

On the other hand, for rANOVA, correlations appear between measurements, and the effect of repeated measurement is commensurate with that of the increase in the number of cases, making it applicable for small samples (Woo, 2019; Luman Learning, 2021). rANOVA is a method of controlling the inherent differences of the experimental unit by measuring two or more times (Park et al., 2011). In comparing treatments or interventions, it has the advantage of increasing comparability as the fluctuations within the target units, or individuals, are separately analyzed and therefore each individual acts as a comparison group, or block (Kang, 2015).

### 3.3. Ethical considerations

This study was conducted through careful ethical considerations. First, the purpose and contents of this study were thoroughly explained, and the voluntary consent of all participants was obtained. It was fully informed that anyone who did not want to participate in the research process could freely express it, and if so, the process was to be terminated without delay. The research also maintained confidentiality and anonymity. Above all, the researchers have been particularly sensitive to ethical issues, considering that the study participants consisted of minors. It was ensured that the underage research participants could fully understand the above information, and the information was also delivered to their parents or guardians.

## 4. Analysis results

Following shows the basic information of the seven individual participants. All participants of the study are non-disabled CODA children whose parents are both hearing-impaired. By gender, there are three males and four females. The experimental group consists of two males and two females, and the control group consists of one male and two females. The age ranges from 9 to 16 years, and the average age is 11.43 years. The average age of the experimental group is 12.25 years, and the average age of the control group is 10.33 years. The participants range from 2nd grader (elementary 2nd grader) to 9th grader (middle school 3rd grader).

**Table 2.** Basic information of research participants

Division	Gender	Age	Grade	Group
Study Participant 1	M	11	Elementary 4 <sup>th</sup> Grader	Experimental group
Study Participant 2	F	13	Elementary 6 <sup>th</sup> Grader	
Study Participant 3	F	9	Elementary 2 <sup>nd</sup> Grader	
Study Participant 4	M	16	Middle 3 <sup>rd</sup> Grader	Control group

Study Participant 5	F	10	Elementary 3 <sup>rd</sup> Grader
Study Participant 6	M	12	Elementary 5 <sup>th</sup> Grader
Study Participant 7	F	9	Elementary 2 <sup>nd</sup> Grader

The descriptive statistics of self-esteem for each period of the experimental group and the control group are as follows. First, in experimental group, the mean prior self-esteem was 29.0 (standard deviation 2.829), and the mean posterior self-esteem was 34.5 (standard deviation 1.732). The control group's mean prior self-esteem was 29.3 (standard deviation 5.859), and the mean posterior self-esteem was 30.7 (standard deviation 5.686). As a result of descriptive statistics analysis, both groups showed higher scores after the volunteer program than before.

**Table 3.** Pre-post self-esteem descriptive statistics by group

Group	Time point	Mean	Standard Deviation
Experimental Group	Pre	29.0	2.829
	Post	34.5	1.732
Control Group	Pre	29.3	5.859
	Post	30.7	5.686

The results of rANOVA, conducted to verify the effectiveness of the volunteer program, are as follows. First, to examine the suitability of rANOVA model, the results of the sphericity test were examined. If the value of Mauchly's W is close to 1, the model is suitable (Park et al., 2011), and in this analysis it was found to be 1.0. Therefore, it is considered that the rANOVA model in this study is suitable. Specific rANOVA analysis results are shown in Table 4 below. First, there was a statistically significant difference in the a result of pre-post analysis ( $F=18.473$ ,  $p<.01$ ). Therefore, in both the experimental group and the control group, growth effect appeared over time. Second, between the groups and between before and after the program, there was a significant statistic difference ( $F=6.868$ ,  $p<.05$ ).

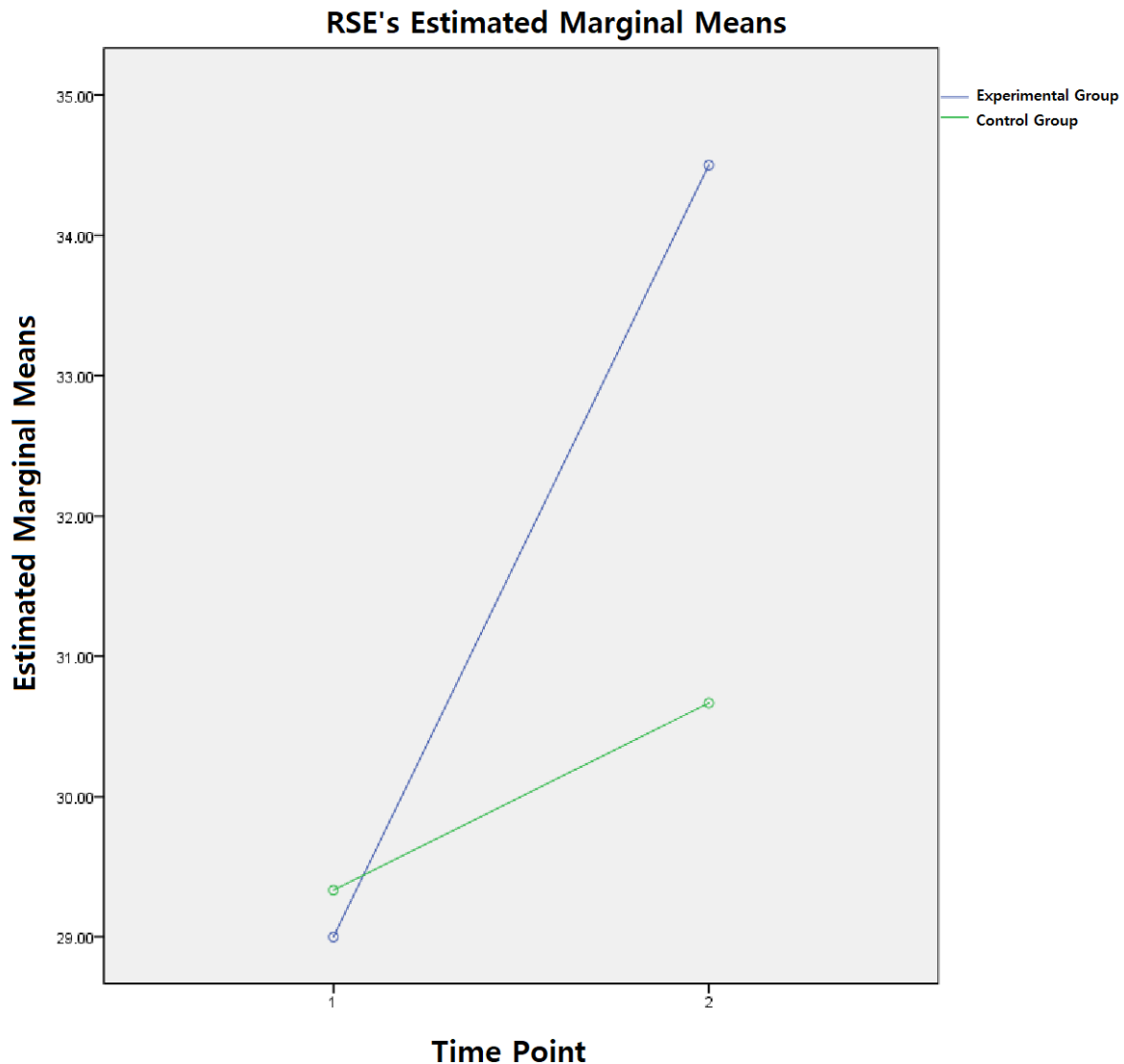
**Table 4.** rANOVA Analysis Results

	Type III Sums of Squares	the degree of freedom	mean square	F
pre-post	40.024	1	40.024	18.473**

pre-post * group	14.881	1	14.881	6.868*
error	10.833	5	2.167	

\* p<.05, \*\* p<.01

The following <Figure 3> shows other changes in the estimated peripheral mean of RSB in the experimental group and the control group at different time points. Time point 1 is before the program is implemented, and time point 2 is after the program is implemented. The estimated peripheral mean of RSB increased in both groups. Average slope of the experimental population is higher than that of the control population, and the experimental group showed significant change in RSB. In other words, both groups showed growth effect, but the increase in self-esteem was greater in the experimental population, which verifies the effectiveness of the volunteer program. As such, the effect of the volunteer program proved significant.



**Figure 3.** Profile Plots

## 5. Conclusion

Following The present study verifies the effectiveness of youth volunteer activities in raising self-esteem of CODAs who use both sign language and vocal language, and experience both deaf culture and non-deaf culture. Based on the previous studies on the effectiveness of art therapies in improving children's self-esteem (Kim, 2004; Seo, 2010; Park, 2012; Yoo and Han, 2015; Cho and Oh, 2017), the volunteer activity centered on art activities including making flowers, imagining and drawing one's future, making frames, making pen cases, etc., carried out in non-face-to-face manner due to COVID-19. Experimental studies were conducted based on nonequivalent comparison group design with a 4-person experimental group and a 3-person control group.

In order to verify the effectiveness of volunteer activities, RSE scale and rANOVA analysis method were applied to examine the pre-post differences between the experimental and control groups. As a result, in both control and experimental group, self-esteem increased after the program was conducted. The growth effect of the school-aged was found. It was also verified that the increase in self-esteem was significantly higher in the experimental group than in the control group, which attests to the effectiveness of virtual youth volunteering.

The result of this study suggests following academic and practical implications.

On the academic level, this study supports the results of previous researches that art activities have a positive effect on children's self-esteem (Kim, 2004; Seo, 2010; Park, 2012; Yoo and Han, 2015; Cho and Oh, 2017), it further discovers that such effect is not limited to children from low-income households, children from divorced families, abused children, and general elementary school children but also applies to CODAs. Given that the volunteer program was carried out by CODAs and similar age group, the results of this study also supports the previous study (Kim, 2013) that relationships with similar age group has positive effect on the self-esteem.

Practical implications are as follows. First, while help for hearing-impaired families has conventionally been centered around the hearing-impaired members, their non-disabled children should receive greater attention. As young carers, they generally experience loss of self-esteem, bullying, poor academic achievements, social withdrawal, and identity crisis (Lee, 2013; Wu, 2015; Preston, 1995; Sahoo and Suar, 2009; Knight, 2018), and there is a pressing need to address this issue. In order to tackle such blind spots of social welfare, it is necessary to foster volunteers for CODAs and for welfare facilities to directly tackle such issues. Secondly, under COVID-19 situation, there is a strong need to approve volunteer activity hours for virtual volunteer activities, as it has been verified through this research that virtual volunteers prove effective. Since teenage students need to have their volunteer activity hours approved for college admissions (Lee et al., 2017), such change will indeed facilitate teenagers' virtual volunteer activities.

In spite of the above implications, the present study has following limitations. First, the research was conducted not with nationwide random sampling but with non-probability sampling in which the participants were selected from a regional organization. Hence, it seems hasty to generalize the result to the entire nationwide CODA population. More nationwide researches based on probability sampling should be conducted to overcome this limitation. Second, various programs should be developed on top of art activities. This research focused on art activities such as drawing and creating based on the previous studies (Kim, 2004; Seo, 2010; Park, 2012; Yoo and Han, 2015; Cho and Oh, 2017). Approaches can be still more varied; other activities such as mentoring program (Choi, 2012), comprehensive meditation program (Kim, 2006), career exploration program (Kim and Kim, 2003) may also improve CODAs' self-

esteem. These activities, however, were provided not for CODAs. If they are applied, profound consideration on the characteristic of CODAs should follow.

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