



Differences Between Stressed Parents and Their Children: A Brief Analysis on Parent-Child Depression, Stress, Aggression and Possible Roles of Digitalized Parenting Education

Hyunchan Hwang, Kyung Joon Min, and Doug Hyun Han

Department of Psychiatry, College of Medicine, Chung-Ang University, Seoul, Korea

Objectives: Digital therapeutics are becoming increasingly important in mental health due to their numerous advantages. One area that could benefit significantly is parenting education. To address this, we developed a short-term, smartphone-based parenting education program designed to support parents who lack access to relevant resources. This study analyzed baseline data from participants to identify factors influencing depressive symptoms in both parents and children.

Methods: Participants were recruited from a rural region of the Republic of Korea. The study included parents experiencing stress related to raising children aged 11 to 16 years. Data on psychological well-being and family relationships were collected and analyzed from 47 parent-child dyads. Participants engaged with a six-week parenting education application aimed at reducing parenting stress. This article does not include an analysis of the intervention's efficacy.

Results: The child perceived their families as more chaotic compared their parents ($t=-2.55$, $p=0.01$). Parental depression was significantly associated with their stress levels ($B=0.70$, $p=0.004$), anxiety ($B=0.32$, $p=0.03$), relational frustration ($B=0.16$, $p=0.04$), family enmeshment ($B=-0.13$, $p=0.04$) and the child's perception of family flexibility ($B=0.10$, $p=0.04$). In contrast, children's depression was associated with lower self-esteem ($B=-0.55$, $p=0.02$) and aggression ($B=0.23$, $p=0.01$).

Conclusion: These findings highlight the importance of individualized parenting education programs, particularly those that address the specific needs of both parents and children. Digital therapeutics hold significant potential for providing accessible, evidence-based parenting support aimed at improving mental health outcomes in families.

Keywords: Telemedicine; Parenting education; Depression.

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Address for correspondence: Kyung Joon Min, Department of Psychiatry, Chung-Ang University Hospital, 102 Heukseok-ro, Dongjak-gu, Seoul 06973, Korea
Tel: +82-2-6299-1505, Fax: +82-2-6299-2017, E-mail: kjoonmin@gmail.com

Address for correspondence: Doug Hyun Han, Department of Psychiatry, Chung-Ang University Hospital, 102 Heukseok-ro, Dongjak-gu, Seoul 06973, Korea
Tel: +82-2-6299-1505, Fax: +82-2-6299-2017, E-mail: hduk70@gmail.com

INTRODUCTION

Digital therapeutics can be broadly defined as evidence-based, high-quality software programs designed for therapeutic interventions [1]. The advent of digital therapeutics has introduced numerous advantages to treatment and interventions in medicine, and has been integrated into many fields of treatment and disease management, such as diabetes mellitus [2], cancer, pain [3], and chronic obstructive pulmonary disease [4], etc. Among the many fields influenced by this technology, mental health has experienced some of the most significant advancements. Compared to conven-

tional mental health interventions, digital therapeutics offer greater accessibility, cost-effectiveness, and the potential for personalized care [5-7].

Parenting education is one area that can benefit substantially from the advantages of digital therapeutics. Despite its importance, the value of effective parenting has not been sufficiently emphasized. Parenting education has proven to be effective in attention-deficit/hyperactivity disorder [8], autism spectrum disorder [9], and depression [10] in both children and parents. Moreover, it is beneficial even in non-clinical settings, with brief interventions often yielding long-lasting effects [11].

While technological advancements have enhanced parenting education, they have also facilitated the spread of misinformation. Misinformation, defined as information which is

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opposite to the consensus of the scientific group, can have many severe effects on the quality of life and health of people [12]. In the context of parenting, misinformation can hinder the effectiveness of educational efforts. Inadequate parental knowledge has been linked to an increased risk of child maltreatment [13], a higher likelihood of abusive behaviors, tendency [14] and elevated parenting-related stress [15]. Providing parenting education developed and endorsed by experts in child and adolescent psychiatry and psychology can help address these challenges.

For these reasons, we developed a six-week parenting education intervention, designed for parents experiencing stress related to parenting and facing difficulties accessing professional support. In this manuscript, we present our study protocol to evaluate the efficacy of the program. Additionally, to inform the future development of parenting programs, we analyzed baseline data from participants, focusing on depressive symptoms in both parents and children, as well as the factors influencing family depression. We hypothesized that children's perceptions of their family environments would differ from those of their parents. Furthermore, we hypothesized that children's psychological factors would have an impact on parental depression.

METHODS

Participants and procedure

Participants were recruited from schools and student mental healthcare facilities (Wee Centers) in Chungcheongbuk-do, Republic of Korea, through notice boards between February 2022 and November 2022. The inclusion criteria were as follows: 1) parents experiencing difficulty in their relationship with their child; 2) having a target child aged 11 to 16 years; and 3) parents with a score of 14 or higher on the Korean version of the Perceived Stress Scale-10 (PSS). The exclusion criteria were as follows: 1) parents or children currently receiving treatment from a psychiatrist, psychologist, or other mental health care provider; 2) parents not proficient in using smartphones; and 3) parents with difficulty understanding Korean. All the participants provided written informed consent.

The study protocol was approved by the Institutional Review Board of Chung-Ang University (IRB Number: 1041078-202111-HR-332-01), and all procedures were conducted in accordance with the Declaration of Helsinki (1975, revised in 2008) and relevant local regulations.

A total of 49 parent-child dyads were recruited for analysis. Two dyads were excluded due to missing depression scale data resulting in a final sample of 47 participants. The data presented in this manuscript are from the baseline analysis of

a randomized controlled trial designed to evaluate the efficacy of a smartphone-based parenting education application. The trial results will be published in a future study.

Intervention

Parents in the current trial were scheduled to use a parenting education application designed by four psychiatrists and two psychologists with extensive experience in treating child and adolescent psychiatric patients and providing parent education. The program was designed to support parents of elementary and middle school children who experience stress and face challenges in parenting. Its primary goal was to reduce parenting stress by offering evidence-based information on child rearing and practical skills that could be readily applied in various challenging parenting situations.

The intervention consisted of three components. The first component provided foundational parenting education. The curriculum incorporated parenting theories from pioneers such as Haim Ginott [16], Rudolf Dreikurs [17], elements of emotion coaching interventions [18] and principles from behavioral parent training [19]. The educational content was structured over six weeks, focusing not only on child development but also on helping parents manage their own stress levels and maintain awareness of their psychological well-being. The second component focused on teaching specific parenting skills, such as active listening and the effective implementation of timeouts, which parents could apply directly in interactions with their children. The final component included interactive quizzes designed to reinforce key parenting concepts. Additionally, supplementary educational materials—such as professionally verified videos and books—were provided to enhance learning.

Assessment instruments

Parent-reported assessments

Korean version of the Perceived Stress Scale-10

The PSS is a self-report questionnaire designed to assess overall psychological stress. The original PSS comprised 14 items; the 10-item version was used in this study due to its strong psychometric properties [20]. Higher scores indicate greater perceived stress.

Center for Epidemiologic Studies-Depression Scale

The Center for Epidemiologic Studies-Depression Scale (CES-D) was used to assess depressive symptoms. This self-report questionnaire includes 20 items, with higher scores reflecting more severe depression. Although initially developed for epidemiologic studies [21], it has been widely used

in various populations to measure depression levels globally.

Korean version of the Beck Anxiety Inventory

The Korean version of the Beck Anxiety Inventory (BAI) is a widely used scale designed to assess anxiety, originally developed by Beck et al. [22]. It consists of 21 items, with scores ranging from 0 to 63. Higher scores indicate greater levels of anxiety. The BAI is applicable in both clinical and non-clinical settings.

Korean Parenting Stress Index, Fourth Edition

The Korean Parenting Stress Index, Fourth Edition (K-PSI), was used to measure parental stress related to child-rearing. This self-report questionnaire, developed by Abidin [23], was administered in a shortened version for this study. However, due to its conceptual overlap with the PSS, it was not included in the current analysis.

Korean Parent-Child Relationship Questionnaire

The Korean Parent-Child Relationship Questionnaire (K-PRQ), adapted from the original version by Kamphaus and Reynolds [24] assesses the quality of the parent-child relationship from the parent's perspective. It covers seven factors: attachment, disciplinary practices, involvement, parenting confidence, relational frustration, communication, and satisfaction with school. T-scores were used for analysis, with scores 41 and 59 representing the average range (encompassing approximately two-thirds of the population).

Child-reported assessments

Center for Epidemiologic Studies-Depression Scale for Children

The Center for Epidemiologic Studies-Depression Scale for Children was used to assess depressive symptoms in children. This self-report scale is an adaptation of the CES-D modified to be age-appropriate for children and adolescents [25]. Higher scores indicate more severe depressive symptoms.

Korean Buss-Perry Aggression Questionnaire

The Korean Buss-Perry Aggression Questionnaire (K-BPAQ) measures various dimensions of aggression, including physical aggression, verbal aggression, anger, and hostility [26]. It consists of 27 items, with higher scores reflecting greater levels of aggression.

Korean version of the Inventory of Parent and Peer Attachment

The Korean version of the Inventory of Parent and Peer Attachment Revised (IPPA) is a self-report questionnaire comprising 25 items that assess children's relationships with significant figures in their lives [27]. Three versions are available-

mother, father, and close friend and the relevant version was administered based on the specific parent-child dyad in the study.

Rosenberg Self-Esteem Scale

The Rosenberg Self-Esteem Scale (RSES) was used to evaluate self-esteem in adolescents [28]. The Korean version, translated by Kang, employs a 5-point Likert scale, with higher scores indicating greater self-esteem [29].

Korean Parenting Attitude Test-Child version

The Korean Parenting Attitude Test (PAT) is a self-report questionnaire designed to assess children's perceptions of their parents' parenting attitudes [30]. It evaluates eight factors: supportive expression, rational expression, achievement pressure, involvement, punishment, supervision, expectations, and inconsistency. Scores were standardized and reported as T-scores.

Assessments completed by both parents and children

Family Adaptability and Cohesion Evaluation Scale IV

The Family Adaptability and Cohesion Evaluation Scale IV (FACES) assesses family cohesion and flexibility [31]. The scale measures eight dimensions: two balanced factors (cohesion and flexibility) that reflect healthy family functioning, and four unbalanced factors (disengaged, enmeshed, rigid, and chaotic) that indicate unhealthy family dynamics. Higher scores on the balanced factors indicate healthier family systems, whereas higher scores on the unbalanced factors suggest dysfunction. Additionally, the scale includes two supplemental factors—communication and satisfaction—which measure the quality of family communication and overall satisfaction with family relationships. Higher scores indicated more positive results. Scores were converted to percentiles for comparative analysis.

Statistical analysis

All statistical analyses were conducted using SPSS version 19 (IBM Corp.). Paired t-tests were performed to compare the FACES subscale scores between parents and children. Pearson's correlation analysis was used to examine the relationships between depressive symptoms in parents and children and various demographic, psychological, family, and parenting factors.

For stress measurement, the PSS was utilized, while the K-PSI was excluded from the analysis to focus on an overarching evaluation of stress. Linear regression analyses were conducted with parental and child depression as dependent variables. Independent variables included factors that showed

significant correlations with parental or child depression in preliminary analyses.

Statistical significance was set at $p < 0.05$.

RESULTS

Demographic and clinical characteristics

The mean age of parents was 40.51 ± 3.58 years, and the mean age of children was 10.02 ± 1.54 years. The majority of the parents were mothers (78.7%), while the gender distribution among children was balanced. Among the 47 participating parents, one was divorced, and the remaining 46 were married. A total of 61.7% of the families were nuclear families, while 38.3% lived with extended family members. The average number of children per family was 2.02 ± 0.68 .

Regarding clinical characteristics, the mean parental PSS score was 17.30 ± 4.34 , indicating above-average stress levels. The mean BAI score was 7.91 ± 7.14 , reflecting minimal to mild anxiety levels. The mean K-PSI score was 49.18 ± 10.20 , considered within the average range. All subscales of the K-PRQ fell within the average range.

For the children, the mean K-BPAQ score was 50.72 ± 12.54 , slightly below average. The mean IPPA score was 93.53 ± 9.31 , slightly above average. The mean RSES score was 41.38 ± 5.42 , considered high. Regarding the PAT subscales, supportive expression was slightly above average (64.64 ± 26.44), while expectations were slightly below average (34.43 ± 24.15). Other subscale scores were within the average range. Detailed demographic and clinical data are presented in Tables 1 and 2.

Differences in family adaptation and cohesion between parents and children

To assess family adaptation and cohesion, FACES subscale scores were compared between parents and children. The chaotic subscale score was significantly higher in children than in parents ($t = -2.55$, $p = 0.01$). No other significant differences were observed between groups (Table 3).

Factors correlate with parental and child depression

Parental depression showed significant correlations with the following factors: parental PSS, parental BAI, parental FACES-enmeshed subscale, K-PRQ relational frustration subscale, child FACES-flexibility subscale, and PAT punishment subscale. Child depression was significantly correlated with the K-PRQ subscales for attachment, involvement, parenting confidence, and relational frustration, as well as with child K-BPAQ, IPPA, RSES, and PAT subscales for supportive expression, expectations, and inconsistency (Table 4). Additional correlation data are provided in Supplementary Tables 1 and 2.

Table 1. Demographic and clinical characteristics of the parents

Variable	Value (n=47)
Demographic characteristics	
Age (yr)	40.51 ± 3.58
Gender	
Male	10 (21.3)
Female	37 (78.7)
Parent education	
High school graduate	5 (10.6)
University graduate (under 3 years)	20 (42.6)
University graduate (over 4 years)	16 (34.0)
Graduate school graduate	6 (12.8)
Marriage status	
Divorced	1 (2.1)
Married	46 (97.9)
Number of children	2.02 ± 0.68
Living with other family members	
No	29 (61.7)
Yes	18 (38.3)
Parent job status	
Whole day	24 (51.1)
Part time	4 (8.5)
Not employed	19 (40.4)
Parent work time (hour per week)	20.28 ± 20.31
Family income*	
Under 1 million won	1 (2.2)
1–2 million won	2 (4.3)
2–3 million won	3 (6.5)
3–4 million won	10 (21.7)
4–5 million won	11 (23.9)
5–6 million won	9 (19.6)
6–7 million won	4 (8.7)
7–8 million won	1 (2.2)
8–9 million won	1 (2.2)
Over 10 million won	4 (8.7)
Clinical characteristics	
PSS	17.30 ± 4.34
BAI	7.91 ± 7.14
K-PSI	49.18 ± 10.20
K-PRQ	
Attachment	51.28 ± 11.82
Communication	51.49 ± 12.15
Discipline practices	48.19 ± 8.75
Involvement	49.57 ± 11.49
Parenting confidence	49.53 ± 10.45
School satisfaction	49.13 ± 10.94
Relational frustration	46.13 ± 13.29

Values are presented as mean \pm standard deviation or number (%). *one person did not answer. BAI, Beck Anxiety Inventory; K-PRQ, Korean Parent-Child Relationship Questionnaire; K-PSI, Korean Parent Stress Index; PSS, Perceived Stress Scale-10

Linear regression analysis of parent and child depression

For parental depression, linear regression analysis of significantly correlated factors yielded a high coefficient of determination ($R^2=0.66$, $F=13.01$, $p<0.001$).

Parental PSS was the most significant predictor, followed by parental BAI, parental FACES-enmeshed subscale, K-PRQ relational frustration subscale, and child FACES-flexibility subscale (Table 5).

For child depression, linear regression analysis also showed a strong model fit ($R^2=0.53$, $F=4.11$, $p=0.001$). The child's K-BPAQ and RSES scores were significant predictors (Table 6).

Table 2. Demographic and clinical characteristics of the child

Variable	Value (n=47)
Demographic characteristics	
Age (yr)	10.02 ± 1.54
Gender	
Male	26 (55.3)
Female	21 (44.7)
Clinical characteristics	
K-BPAQ	50.72 ± 12.54
IPPA	93.53 ± 9.31
RSES	41.38 ± 5.42
PAT	
Supportive expression	64.64 ± 26.44
Rational expression	55.66 ± 24.54
Achievement pressure	48.40 ± 26.32
Involvement	45.19 ± 31.56
Punishment	48.11 ± 32.14
Supervision	58.98 ± 26.93
Expectation	34.43 ± 24.15
Inconsistency	47.66 ± 25.92

Values are presented as mean ± standard deviation or number (%). IPPA, Korean version of the Inventory of Parent and Peer Attachment; K-BPAQ, Korean Buss-Perry Aggression Questionnaire; PAT, Korean Parenting Attitude Test checked by Youth; RSES, Rosenberg Self-Esteem Scale

DISCUSSION

Our analysis revealed that in parent-child dyads where parents experienced stress, children perceived their family environments as more chaotic compared to their parents' perceptions. Other dimensions of family functioning showed no significant differences. Direct comparisons of family perceptions between parents and children are rare, partly due to the

Table 4. Correlation between parent-child depression and other related factors

	Pearson correlation	p
Parent depression (CES-D)		
Parent PSS	0.70	<0.001
Child FACES-flexibility	0.31	0.04
Parent BAI	0.62	<0.001
Parent FACES-enmeshed	-0.30	0.04
K-PRQ-relational frustration	0.37	0.01
PAT-punishment	0.31	0.04
Child depression (CES-DC)		
K-PRQ-attachment	-0.36	0.01
K-PRQ-involvement	-0.34	0.02
K-PRQ-parenting confidence	-0.29	0.048
K-PRQ-relational frustration	0.34	0.02
Child K-BPAQ	0.41	0.004
Child IPPA	-0.49	<0.001
Child RSES	-0.61	<0.001
PAT-supportive expression	-0.38	0.01
PAT-expectation	0.29	0.0498
PAT-inconsistency	0.34	0.02

BAI, Beck Anxiety Inventory; CES-D, Center for Epidemiologic Studies-Depression; CES-DC, Center for Epidemiologic Studies-Depression for Children; FACES, Family Adaptability and Cohesion Evaluation Scale IV package; IPPA, Korean Inventory of Parent and Peer Attachment; K-BPAQ, Korean Buss-Perry Aggression Questionnaire; K-PRQ, Korean Parent-Child Relationship Questionnaire; PAT, Korean Parenting Attitude Test checked by Youth; PSS, Perceived Stress Scale-10; RSES, Rosenberg Self-Esteem Scale

Table 3. Differences between parent-child depression and family adaptability and cohesion

	Parent	Child	t	p
Depression	13.66 ± 7.22	12.21 ± 6.74		
FACES				
Cohesion	64.09 ± 10.18	62.00 ± 12.83	1.05	0.30
Flexibility	57.60 ± 12.16	54.74 ± 14.74	1.79	0.08
Disengaged	21.09 ± 6.76	21.81 ± 9.99	-0.56	0.58
Enmeshed	32.66 ± 11.89	31.68 ± 13.01	0.44	0.67
Rigid	42.77 ± 15.68	40.77 ± 16.09	0.89	0.38
Chaotic	22.11 ± 8.71	26.38 ± 11.28	-2.55	0.01*
Family communication	60.30 ± 23.12	62.55 ± 25.73	-0.69	0.49
Family satisfaction	58.34 ± 25.60	62.66 ± 25.88	-1.25	0.22

Values are presented as mean ± standard deviation. * $p<0.05$. FACES, Family Adaptability and Cohesion Evaluation Scale IV package

Table 5. Linear regression analysis on parent depression

	B	95% Confidence interval	p
Parent PSS	0.70	0.23 to 1.17	0.004*
Parent BAI	0.32	0.03 to 0.61	0.03*
Parent FACES-enmeshed	-0.13	-0.25 to -0.01	0.04*
Child FACES-flexibility	0.10	0.01 to 0.20	0.04*
K-PRQ-relational frustration	0.16	0.01 to 0.31	0.04*
PAT-punishment	-0.05	-0.11 to 0.02	0.16
$R^2=0.66$, $F=13.01$, $p<0.001$			

* $p<0.05$. BAI, Beck Anxiety Inventory; FACES, Family Adaptability and Cohesion Evaluation Scale IV package; K-PRQ, Korean Parent-Child Relationship Questionnaire; PAT, Korean Parenting Attitude Test checked by Youth; PSS, Perceived Stress Scale-10

Table 6. Linear regression analysis on child depression

	B	95% Confidence interval	p
K-PRQ			
Attachment	0.08	-0.21 to 0.36	0.59
Involvement	-0.01	-0.22 to 0.20	0.91
Parenting confidence	-0.16	-0.43 to 0.11	0.24
Relational frustration	-0.09	-0.27 to 0.10	0.35
Child K-BPAQ	0.23	0.07 to 0.38	0.01*
Child IPPA	0.01	-0.28 to 0.30	0.96
Child RSES	-0.55	-1.00 to -0.10	0.02*
PAT			
Supportive expression	-0.08	-0.18 to 0.02	0.12
Expectation	-0.02	-0.10 to 0.06	0.63
Inconsistency	0.01	-0.07 to 0.09	0.74
$R^2=0.53$, $F=4.11$, $p=0.001$			

* $p<0.05$. IPPA, Korean Inventory of Parent and Peer Attachment; K-BPAQ, Korean Buss-Perry Aggression Questionnaire; K-PRQ, Korean Parent-Child Relationship Questionnaire; PAT, Korean Parenting Attitude Test checked by Youth; RSES, Rosenberg Self-Esteem Scale

limited availability of assessment tools designed for both groups. A comparable tool is the Affective Reactivity Index, which evaluates child irritability from both the parent's and child's perspectives [32]. This scale is unique because it includes both parent and child versions. The parent version asks the parent about their child, and the child is asked about him/herself. A comparison between children and parents in an American sample found that parents found their child to be more irritable in certain aspects than what the child themselves thought about; however, this was not repeated in a sample from England. Our research differs from this, as we asked both groups how they felt about their family, which could make the reports slightly more objective than asking about themselves. The fact that children perceive their families as more chaotic could suggest that they are more sensitive to changes in family dynamics, likely due to their developmental stage and limited coping resources [33]. The impact of adverse childhood experiences on psychological development is well documented [34], and future research could explore whether children detect shifts in family health earlier than their parents.

Parental depression was most strongly associated with pa-

rental stress and anxiety, followed by relational frustration with the child, family enmeshment, and the child's perceived family flexibility. Interestingly, enmeshment was negatively correlated with depression. While enmeshed family dynamics can lead to issues such as dependency and blurred boundaries, they may also provide emotional and social support, particularly in low-enmeshment contexts. Kusz and Ahmad [35] stated that family engagement is important for healthy aging and for many parents. Our sample showed low levels of enmeshment, suggesting that in such environments, enmeshment may reflect positive family engagement.

Child depression was significantly influenced by aggression and self-esteem. The association between aggression and depression is well-established, with aggression often preceding depressive symptoms [36]. Similarly, low self-esteem is a known risk factor for both depression and anxiety in children [37,38]. These findings highlight the importance of incorporating interventions targeting aggression and self-esteem into parenting education programs. Interestingly, family-related factors did not significantly predict child depression in the regression analysis, possibly because our sample consisted of stressed but

not clinically depressed parents. This suggests that individualized parenting programs may be more effective for children in mildly problematic family environments.

Overall, our findings found indicate that parenting stress, relational frustration, and child aggression are key contributors to depressive symptoms in both parents and children. Our intervention program, which focuses on reducing parenting stress, improving parent-child relationships, and teaching practical behavioral strategies, is expected to be beneficial, particularly for parents with limited access to professional support—such as those living in rural areas. While the program lacks individualization, it addresses key components of effective parenting. Previous meta-analyses have shown that universal parenting interventions can enhance parental self-efficacy [39]. Future iterations of our program should incorporate individualized components to improve both efficacy and participant engagement [40,41].

Limitations

This study has several limitations. First, the relatively small sample size limits the generalizability of our findings. Second, important family dynamics, such as parental relationships and broader family structures, were not included in the analysis. Finally, as all participants were from the Republic of Korea, the findings may not be fully applicable to other cultural contexts. Future research should address these limitations to enhance validity of the results.

CONCLUSION

In conclusion, the baseline analysis of our study population revealed that different factors influence depression in parents and their children. Parental depression appears to be more strongly associated with family-related factors, whereas children's depression is primarily influenced by individual psychological factors such as self-esteem and aggression. These findings highlight the importance of developing targeted parenting education programs that addresses both parental and child-specific needs. Such interventions could be beneficial not only for improving children's mental health but also for enhancing the well-being of parents.

Supplementary Materials

The Supplement is available with this article at <https://doi.org/10.5765/jkacap.240042>.

Availability of Data and Material

The datasets generated or analyzed during the study are not publicly available due to protection of privacy but are available from the corresponding author on reasonable request.

Conflicts of Interest

The authors have no potential conflicts of interest to disclose.

Author Contributions

Conceptualization: Hyunchan Hwang. Data curation: Hyunchan Hwang. Formal analysis: Hyunchan Hwang. Investigation: Hyunchan Hwang. Methodology: all authors. Project administration: Hyunchan Hwang. Resources: Hyunchan Hwang. Supervision: Doug Hyun Han. Validation: Doug Hyun Han, Kyung Joon Min. Writing—original draft: Hyunchan Hwang. Writing—review & editing: Doug Hyun Han, Kyung Joon Min.

ORCID iDs

Hyunchan Hwang	https://orcid.org/0000-0001-6514-5188
Kyung Joon Min	https://orcid.org/0000-0001-7037-8904
Doug Hyun Han	https://orcid.org/0000-0002-8314-0767

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