

Creation of a Recognition and Implementation Evaluation Sheet for the Couple Parenting Promotion Program

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ABSTRACT

As the final stage of the Grant-in-Aid for Scientific Research project “Development and Evaluation of a Couple Parenting Promotion Plan,” this study finalized the Recognition and Implementation Evaluation Sheet to support the finalization and dissemination of the couple parenting program. In Study 1, we compiled the web-based intervention survey content (4 perspectives, 14 items over 1 week) into a trial version of the sheet on a single A4-sized sheet. The trial sheet’s clarity was assessed through a free-response survey (March 2025) conducted among 378 individuals who had collaborated in the web-based intervention survey. These participants were parents aged 25–38 years who were raising children aged 5 years or younger and residing across all Japan prefectures. We then incorporated their feedback in the final version of the sheet. In Study 2, we verified the finalized sheet’s effectiveness. To focus on implementation points, both partners used the finalized sheet in implementing all items (dividing the 4 perspectives into 2, each implemented for 2 weeks, totaling 4 weeks). Effectiveness was verified by examining changes in the shortened version of the Couple Parenting Awareness Scale item scores (5-point scale) before and after the intervention. Simultaneously, participants provided free-response evaluations of the sheet. In total, 473 individuals voluntarily participated, meeting the same eligibility criteria as those in Study 1. Using the finalized sheet, we observed improvements in couple parenting, showing significant increases in 11 of 15 sub-items across all four scale items. Interventions using the trial sheet yielded significant increases in only three items, with no significant improvements in “Mutual Emotional Support” and “Shared Responsibility and Difficulties.” The latter obtained the lowest scores among the four scale items and acted as a negative factor between scale items.

Keywords: Couple parenting program, Recognition and Implementation Evaluation Sheet, Child-rearing.

INTRODUCTION

As this research, funded by Grant-in-Aid for Scientific Research, reached its final year, we aimed to develop a recognition and implementation evaluation sheet to complete and disseminate a program promoting couple parenting.

Regarding family education, Article 10 of Japan's Fundamental Law of Education (Ministry of Education, Culture, Sports, Science and Technology, 2006) states the following: “Parents and other guardians shall bear primary responsibility for the education of their children. They shall endeavor to instill in them the habits necessary for life, foster their independence, and promote their harmonious physical and mental development.” Therefore, parents’ responsibility to

provide their children with education is fundamental. In other words, child-rearing is not solely the mother's responsibility; parental collaboration fosters a harmonious relationship and greatly benefits the child's development. However, as the child grows, paternal involvement tends to decrease (Kato, Kurosawa, Kamiya, 2014/Kato, 1999/Benesse Next Generation Research Institute, 2011). Marital intimacy has also been reported to decline (Benesse Education Research Institute, 2016), and mothers with strong gender role beliefs tend to have partners who are less involved in childcare (McBrid BA et al., 2005). Therefore, intentional interventions to promote couple parenting are necessary. This report reviews the research findings from the 2017–2021 research project funded by the Grant-in-Aid for Scientific Research and outlines the progression that led to the formulation of the final research question. First, we examined “mothers’ behaviors that promote and criticize fathers’ childcare involvement” using the Couple Parenting Coordination Scale. We analyzed these behaviors as couple parenting coordination, categorizing them into four patterns according to the mother's perception of her own actions and the father's perception of the mother's actions, each with varying levels of promotion and criticism. These patterns were distributed almost evenly. Couples with high levels of promoting behaviors and low levels of criticism behaviors demonstrated the most favorable psychological state. Mothers in this pattern engaged in childcare-related discussions and successfully reached mutual agreements. Thus, achieving mutual agreement through discussions can be an important perspective to consider (Shimizu, 2020a).

Furthermore, research on factors influencing couple parenting (Shimizu, 2021b) identified “gratitude toward the husband,” “lack of support from the husband,” and “discussion (present)” as factors affecting mothers’ promoting behaviors. Among them, “discussions (present)” had the strongest influence on promoting high levels of encouragement, followed by “gratitude toward husband.” “Lack of husband's support” reduced the likelihood of high encouragement. Conversely, “desire to be perfect” most strongly influenced high levels of criticism. The likelihood of receiving high criticism levels was reduced by “gratitude toward husband” and “understanding/support for husband.” In other words, husbandly support and couple discussions positively influence promoting behaviors, whereas the desire to be perfect increases criticism behaviors. Gratitude toward the husband and husband's understanding/support suppress criticism behaviors, thereby possibly promoting couple parenting.

In the development of the Couple Parenting Scale (Shimizu, 2023a), a four-factor structure was established, comprising 29 items. These four factors are “Consideration and Gratitude Towards the Partner” (10 items), “Desire and Actions to Help Each Other” (7 items), “Couple Communication” (5 items), and “Factors Hindering Couple Cooperation” (7 items). Concurrent validity analysis showed that this scale significantly correlates with the Couple Parenting Adjustment Scale and the “Reality” of Marriage Scale. Internal consistency was confirmed through inter-factor correlations. Analysis with the Parental Development Awareness Scale and its attributes clarified the couple parenting characteristics measured by this scale. Subsequently, efforts were made to streamline items to enhance versatility and facilitate scale utilization. As a result, a shortened version of the Marital Parenting Perception Scale was developed (Shimizu, 2023cd), consisting of 15 sub-items across four scale items, namely, “Mutual Emotional Support,” “Mutual Concrete Support,” “Parenting Agreement and Negotiation,” and “Shared Responsibility and Difficulties.” The sub-items were abstracted and

modified in consideration of global trends in couple parenting research. Consequently, a promotion program proposal was developed using the shortened version.

Qualitative research revealed differences and characteristics in how couples perceive criticisms regarding childcare (Shimizu, 2020b). While wives perceived their husbands' criticisms as either positive or negative, husbands perceived criticisms from their wives as either positive, negative, or sometimes irrelevant. For wives, the underlying reasons for criticisms included differences in upbringing, parental role perceptions, and marital relationship distortions stemming from their respective personality tendencies. For husbands, these reasons additionally included roles and relationships within the household. Before such discrepancies in perception and interpretation become significant, communicating each other's feelings, revisiting parental role perceptions, respecting each other's views on childcare, and sharing dissatisfactions are useful for couple parenting.

Furthermore, regarding awareness of the marital relationship and feelings about couple parenting (Shimizu, 2021b), mutual trust, gratitude, and support can make couples feel satisfied with their relationship. Additionally, the husband's desire to support his wife and the wife's sense of being supported by her husband for the sake of their child helped maintain and adjust their relationship.

Therefore, a program proposal was developed, and an intervention study was undertaken. Given the correlation between increased recognition of "the effect of father's educational participation" and higher couple parenting scores (Shimizu Yoshiko, 2024), we conducted an intervention study with a preintervention discussion about "father's educational participation" for couples. Participants were divided into two groups: a group continuing the intervention for one month and a group not continuing the intervention. We focused on changes at three time points: before, immediately after, and one month after the intervention. Results revealed that the one-month continuation group clearly remembered and was conscious of the program's content after participation (Yoshiko Shimizu, 2025a). Before the program, wives felt the need to be more conscious on childcare life, while husbands felt that the current state is fine. However, more husbands than wives continued the program activities and remained conscious of them. The husband's scale item "Shared Responsibility and Difficulties" showed significantly lower scores than the three other scale items and acted as a negative factor between such scale items. The husband's cooperation did not align with the wife's perception of satisfaction; this discrepancy resulted from the lack of communication (Yoshiko Shimizu, 2025b). The program's effectiveness depended on the level of interaction between partners; this interaction included shared commitment, mutual understanding of each other's feelings, and the continued expression of gratitude and appreciation. Therefore, when designing the program, we need to correctly understand the significance of couple parenting, encourage each couple to reflect on their current situation and commit to concrete actions, and incorporate many elements that promote "couple communication," identified as a factor that enhances couple parenting effectiveness.

Building on previous research findings, this study aimed to develop a method for smooth program implementation. To this end, we asked couples who previously participated in program intervention surveys to evaluate a trial version of the Recognition and Implementation

Evaluation Sheet. Using their feedback, we created and attempted to validate a final version of the evaluation sheet.

STUDY 1

Purpose

Study 1 involved creating a trial version of the Recognition and Implementation Evaluation Sheet. The trial sheet's effectiveness was examined by conducting a survey involving child-rearing couples who have participated in program intervention surveys. The couples' feedback was then used to refine the final version of the evaluation sheet.

Methods

Creation of the Trial Version of the Recognition and Implementation Evaluation Sheet for Couple Parenting

Content of the Couple Parenting Promotion Program:

The four scale items of the Couple Parenting Awareness Scale's shortened version, namely, "Mutual Emotional Support" (4 items), "Mutual Concrete Support" (4 items), "Parenting Agreement and Negotiation" (3 items), and "Shared Responsibility and Difficulties" (4 items), were set for Programs I to IV (Shimizu Yoshiko, 2023c). We instructed the participants to consciously execute the behavioral points for each item. Table 1 lists the contents recorded on the sheet.

Table 1: Couple Parenting Promotion Program – Objectives and Implementation Details		
Couple Parenting Recognition Scale: 15 Items		Action Points
I. Mutual Emotional Support	Objective	Compassion and Gratitude
1 The husband cares about his wife	Pay attention to her daily condition and changes	Greet her with a smile every day.
2 He makes an effort to understand what his wife desires	He listens and speaks calmly Knowing what she desires	Communicate and listen to requests and hopes.
3 The husband is considerate of his wife	Reflects	Reflecting on daily actions and words
4 The husband makes an effort to listen to his wife	Knowing and understanding her feelings	Listen to her until the end of her story.
II. Mutual Concrete Support	The desire to support each other	
5 The husband naturally helps with both housework and childcare	Doing things together Enjoying housework and childcare	Taking the initiative in housework and childcare
6 My husband helps and shows consideration so I don't get irritated	Does she feel tired or dissatisfied?	Rethinking the division of household chores
7 The husband is motivated and always thinking of better ways to do things	Efficiency in housework and childcare Considering the burden	Try doing the same amount of housework as your wife.
8 My husband cooperates with everything without saying a word or complaining	Expressing appreciation To understand the hardship and gratitude	Husband cooperates with everything Try doing it alone
III. Child-rearing agreements and negotiations	Communication between husband and wife	
9 We watch out for each other and make a point to talk things through as they come up	Communicate often Don't let dissatisfaction build up	Talk about even the smallest things
10 Expressing feelings and opinions verbally to each other	Peaceful resolution If you don't say it, they won't know	Words of gratitude Don't hold back complaints: express
11 Even when entrusted with tasks, my wife makes a point of listening to my opinion	Prepare for smooth handling	Share information
IV. Shared Responsibility and Challenges	Factors Hindering Spousal Cooperation	
12 Husbands spend little time interacting with their wives.	Communication Harmonious Marriage	Create time for the two of you, even if brief
13 Husbands strongly hold the belief that "men work, women manage the home"	Broaden your perspective View things objectively	Avoid being bound by fixed ideas.
14 I wish we could discuss and share things as a couple, but my husband doesn't see it that way	Trust and emotional relief Calmness and problem-solving	Consulting and offering advice
15 Feeling the difference in values between husband and wife	There's no need to make them the same Respect each other	Do not criticize each other's values

Program Implementation Procedure:

Initially, we used the 15-item Couple Parenting Awareness Scale. Both the husband and wife read the questions, as shown in Table 1, as "I" and self-evaluated them (on a 5-point scale: 1 as "not at all applicable" to 5 as "very applicable") by marking the applicable items with a check (circular). If the wife's rating was 3 or lower ("does not apply"), she communicated that feeling

to her husband. Next, they reviewed the “14 Action Points” and self-assessed whether they were currently practicing them, by selecting one applicable option (checkmark for “practicing,” triangle for “need more effort,” cross for “not practicing”). They consciously practiced the action point for one week while reflecting on each day through a dialogue. They then shared their impressions and gratitude with each other after one week. This initiative encouraged reflection, emotional understanding between partners, and improved spousal communication.

Creation of the Trial Version of the Recognition and Implementation Evaluation Sheet:

A trial version of the abovementioned evaluation sheet was created, detailing the initiative steps, self-assessment using the Couple Parenting Awareness Scale, and the objectives and action points for enhancing couple parenting (Figure 1).

Figure1 Couple Parenting Support Program Awareness and Implementation Evaluation Sheet

Procedure ※Please avoid emotional attitudes or tones.
1. Read the questions with “father” as “husband” and “mother” as “wife,” substituting them for “I.” Self-assess and mark the applicable option with a checkmark.
Does not apply at all 1. Somewhat does not apply 2. Neither applies nor does not apply 3. Somewhat applies 4. Applies very much 5
2. The wife communicates her feelings about receiving an evaluation of “does not apply (rating 3 or lower)”.

3. “Action Points” Are you consistently doing these?
Evaluate yourself and fill in the one that applies.
Yes. O. You should put in a little more effort. Δ (triangle). Not able to do it. x

4. Try consciously implementing action points for
5. Reflect on the day and discuss
Check off items both of you
6. After one week, share your thoughts and express gratitude!

Couple Parenting Perception 15 Items		Low ← Evaluation → High					Objective	Action Points	Evaluation of Efforts						
I. Emotional Support		1	2	3	4	5	Compassion and Gratitude	Husband Wife	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
1	The husband is concerned about his wife	Husband					He pays attention to her daily condition and changes	He greets her with a smile every day.							
		Wife													
2	He makes an effort to understand what his wife desires	Husband					He can listen and speak calmly	Communicates and listens to requests and hopes.							
		Wife					Knowing what she desires								
3	The husband is considerate of his wife	Husband					Reflects	Reflecting on daily actions and words							
		Wife													
4	The husband makes an effort to listen to his wife	Husband					Understanding her feelings	Listen to her until the end of her story.							
		Wife													
II. Concrete Support		1	2	3	4	5	The desire to support each other								
5	The husband naturally helps with both housework and childcare	Husband					Doing things together	Taking the initiative in housework and childcare							
		Wife					Enjoying housework and childcare								
6	My husband helps and shows consideration so I don't get irritated	Husband					Does she feel tired or dissatisfied?	Rethinking the division of household chores							
		Wife													
7	Husband is motivated and always thinking of better ways	Husband					Efficiency in housework and childcare	Try doing the same amount of housework as your wife.		—					
		Wife					Considering the burden								
8	My husband cooperates with everything without saying a word or complaining	Husband					Expressing appreciation	Husband cooperates with everything		—					
		Wife					To understand the hardship and gratitude	Try doing it alone							
III. Agreement and Negotiation		1	2	3	4	5	Communication Between Husband and Wife								
9	We watch out for each other and discuss things as they come up	Husband					Communicate Often	Talk about even the smallest things							
		Wife					Don't let dissatisfaction build up								
10	Expressing feelings and opinions verbally to each other	Husband					Peaceful resolution	Words of gratitude							
		Wife					If you don't say it, they won't know	Don't hold back complaints: express them.							
11	Even when entrusted with tasks, my wife makes a point of listening to my opinion	Husband					Prepare for smooth handling	Share information							
		Wife													
IV. Sharing and Challenges		1	2	3	4	5	Factors Hindering Spousal Cooperation								
12	Husbands spend little time interacting with their wives	Husband					Communication	Create time for the two of you, even if brief							
		Wife					Harmonious Marriage								
13	Husbands strongly hold the belief that “men work, women manage the home”	Husband					Widening perspectives	Avoid being bound by fixed ideas.							
		Wife					View things objectively								
14	I want us to discuss and share things as a couple, but my husband doesn't share that view	Husband					Trust and reduced emotional burden	Consulting and offering advice							
		Wife					Calmness and problem-solving								
15	Feeling the difference in values between husband and wife	Husband					There's no need to make them the same	Do not criticize each other's values							
		Wife					Respect each other								

Research Method:

A web survey was conducted via Internet research using Freeasy, a self-service online survey tool.

Survey Participants:

The survey targeted 378 participants of an intervention study for the “Couple Parenting Program Initiative” in July 2024, requesting evaluations from couples. These participants were parents aged 25–38 years who were raising children aged 5 or younger at the time and residing

across all Japan prefectures. Additionally, the pre–post comparison using the shortened Couple Parenting Awareness Scale utilized data from July 2024.

Survey Period:

The survey period was from March 14 to 31 of 2025. The scale value change data used in the analysis were those from the survey conducted from July 26, 2024, to August 2, 2024, involving the same participants.

Survey Overview:

Given that many respondents used smartphones for the web-based survey, three images were uploaded for screen readability: one showing the entire sheet, one with the 15 scale items, and one with the 14 questions on objectives and action points. We asked the participants to follow the steps together as a couple while viewing the images, then provide a free-form evaluation (within 300 characters) regarding readability, clarity, and any other thoughts. Supplementary notes clarified the following: the sheets were enlarged for better visibility; the initiative's purpose was displayed separately, not on the sheets themselves; and the step evaluations could be based on imagined implementation. We also explicitly stated that responses such as “nothing in particular” would be accepted as valid feedback.

Analysis Method:

We excluded inconsistent or incomprehensible responses from the analysis. Free-response comments were categorized as high or low ratings and examined from the perspectives of overall visibility/readability and readability/execution/effectiveness/expectations to capture the overall sentiment.

Results

Evaluation of the Trial Version of the Recognition and Implementation Evaluation Sheet:

We collected 215 evaluations from 186 valid respondents. Among these evaluations, 156 (72.5%) were high ratings, and 59 (27.4%) were low ratings (including suggestions for improvement). Reasons cited for high ratings were the content's specificity and clarity, perceived effectiveness, noticeable changes after the implementation, and good quality. Conversely, low ratings were attributed to unclear and overly detailed content, excessive time requirements, and perceived inconvenience. Table 2 shows the evaluation content.

Table 2: Evaluation of the Trial Version Recognition and Implementation Evaluation Sheet (Multiple Answer)

High Evaluation 156count	Low Evaluation 59count
None 99, Good 4, Excellent 2, Safe 2, Total 107count	Don't know 10, Troublesome 6, Seems difficult 1, Hard 3, Don't want to do it 1, Total: 21count
Visibility, readability, legibility	Visibility, readability, legibility
Easy to understand/clear: 19, Easy to read: 5, Well–broken–down: 1, Concrete: 1, Easy to understand with concrete examples: 1, Easy to answer: 3, Content is easy to understand: 1, Total: 31count	Detailed 5, Hard to understand 4, Too many questions/items 4, Too much text 2, Hard to see 1, Doesn't stick in mind 2, Hard to read 1, Stiff writing 1, Feels like documentation 1, Fixed ideas 1, Standardized 1, Font matters 1, Easy to answer on mobile would be good 1, Total: 25 count
Execution, Effectiveness, Expectations	Execution, Effectiveness, Expectations
Many things to learn 2 Important 2 Interesting 2 Credible 1 Want to use as reference 1 Highly rate 1 Seems useful 1 Seems like it could help explore good marital relationship 1 Very satisfied 1 Feels good 1 Mindset changed 1 High expectations 1 Seems effective 1 Can evaluate each other 1 Can notice differences in thinking 1, Total: 18count	Time–consuming 2 Can't spare the time 1 Tiring 1 Makes me not want to answer 1 Implementation period too short 2 Will this be evaluated? 1 Feels embarrassing 1 Difficult to complete knowing the other person will see the evaluation 1 I think separate responses from husband and wife, then comparing them later, would lead to more honest answers 1 Want separate sections for husband and wife 1 The dotted line separating husband and wife sections is a bit hard to see 1, Total: 13count

Given the importance of information structure and layout, the number of high or low ratings for “visibility,” “readability,” and “legibility” or for implementation/effectiveness and expectations showed no significant differences (nonparametric χ^2 , $p = .599$). Specific evaluations included the following comments: “I felt it might lead to answering only in a way that benefits myself”; “Since both wife and husband answer questions together, it felt awkward because differences in evaluation would be obvious to the other”; “For the 15-item scale, I think answering individually first and then comparing answers would allow for more honest responses without consideration for the other's opinion”; “I wish the husband and wife sections were separated”; “The dotted line separating the husband and wife sections is a bit hard to see”; and “A one-week period is too short to be meaningful for evaluation.”

Development of the Final Version of the Recognition and Implementation Evaluation Sheet:

Improvements were considered according to low-rated items. To address issues such as unclear and overly detailed content, excessive time requirements, and short implementation time, we extended the implementation period. This extension reduced the number of daily tasks, promoted awareness during everyday activities, and alleviated the pressure on the number of items to record. With regard to concerns about couples feeling embarrassed or hesitant to give honest self-assessments, the goal is to foster a relationship wherein partners can listen openly, understand each other's feelings, and engage in open, honest communication. Given that the implementation involved both partners mutually boosting motivation, the sheet encouraged daily reflection conversations where they shared positive points and areas for improvement. We added a checkbox to track what and when it was discussed, as well as coloring and numbering to clarify which of the four program objectives each item addresses. During revision, word count was reduced (Table 3).

Table 3: Trial Version Recognition/Execution Evaluation Sheet <Improvement Proposals for Low Ratings>

Discussion Points	Improvement Proposals
Too many items	Extend the implementation period to reduce the number of daily tasks
Time-consuming	Color-code to clarify what each task addresses Split tasks into two separate sessions
Difficulty in awareness/memorization	Reduce the pressure of required entries Raise awareness through daily actions
Short implementation period	Extend the implementation period
Joint self-evaluation by spouses	Listen to the end—there's a purpose
Embarrassing/difficult to do	Understand each other's feelings. The goal is a relationship where anything can be discussed
Many hard-to-read characters Detailed	Minimize text as much as possible for clarity

Low-rated content containing identified issues was acknowledged, leading to program reconsideration. As detailed earlier, unnoticed evaluations—particularly those concerning appearance or volume—were also considered as they could cause respondent dissatisfaction and hinder implementation. Although implementing couple parenting-promoting programs is meaningful, efficient implementation methods remain undetermined, and the necessity of standardization is unclear. Clarifying the effectiveness of the revised sheet—whether participants followed instructions as intended or if outcomes fell short of expectations—was also considered important. After reviewing the evaluation results and incorporating

suggestions for improvement, we created a final version of the Recognition and Implementation Evaluation Sheet (Figure 2).

Figure 2 Final Version Recognition and Implementation Evaluation Sheet

Procedure ※Please avoid emotional attitudes or tones.

1. Reflect on your usual actions and words (3) and listen to the story to the end (4).
Read the questions with "father" as "husband" and "mother" as "wife" as "I." self-assess, and mark the applicable option with a ○.

Does not apply at all 1 Somewhat does not apply 2 Neither applies nor does not apply 3 Somewhat applies 4 Applies very much 5

2. If the wife's rating is 3 or lower, please tell your husband about the feelings you don't feel "as a wife."
The husband listens to the end without interrupting.

3. Review the action items.
To enhance couple parenting, please complete all items together.

4. Reflect on the day through conversation
Share positive points and areas for improvement

※Communicate both strengths and areas for improvement regarding each other's actions and outcomes, fostering motivation throughout the process.

(Understanding each other's feelings / A relationship where anything can be discussed)

Couple Parenting Perception 15 Items

		Low ← Evaluation → High				
		1	2	3	4	5
I. Mutual Emotional Support						
1	The husband cares about his wife	Husband				
		Wife				
2	The husband makes an effort to understand what his wife desires	Husband				
		Wife				
3	The husband is considerate of his wife	Husband				
		Wife				
4	The husband makes an effort to listen to his wife	Husband				
		Wife				
II. Specific Mutual Support			1	2	3	4
5	My husband naturally helps with both housework and childcare	Husband				
		Wife				
6	My husband helps and shows consideration so his wife doesn't get irritated	Husband				
		Wife				
7	My husband is motivated and always thinking of better ways to do things	Husband				
		Wife				
8	My husband cooperates with everything without saying a word or complaining	Husband				
		Wife				
III. Parenting agreements and negotiation			1	2	3	4
9	We keep each other informed and discuss things as they come up	Husband				
		Wife				
10	Expressing feelings and opinions verbally to each other	Husband				
		Wife				
11	Even when entrusted with tasks, the wife makes an effort to listen to her husband's opinions	Husband				
		Wife				
IV. Sharing responsibilities and challenges			1	2	3	4
12	Husbands spend little time with their wives	Husband				
		Wife				
13	Husbands strongly hold the belief that "men work, women manage the home"	Husband				
		Wife				
14	I wish we could discuss and share things as a couple, but my husband doesn't think that way	Husband				
		Wife				
15	I feel a difference in values between my husband and me	Husband				
		Wife				

This approach will be implemented in two phases.

<1st time> Please continue implementing the following actions for approximately two cycles if conversation is possible: ✓

Action Taken	Objective	Day1	Day2	Day3	Day4	Day5	Day6	Day7
In greetings								
Greet each other with a smile every day. 1	Pay attention to her daily condition and changes							
Express gratitude. 10	If you don't say it, it won't get through							
In communication								
Make time for the two of you, even if it's a brief. 12	Communicate more often							
Talk about even the smallest things. 9	Knowing her desires							
Communicate and listen to requests and hopes. 2	Don't let dissatisfaction build up							
Consulting and offering advice. 14	Deepening the relationship of trust							
Sharing information (schedules, childcare, etc.) 11	Preparing for smooth responses							
<Second time>								
After completing the above, continue the following actions for about two weeks								
While at home, have Dad take the lead on household chores and childcare.								
However, act according to the situation. Adjust your approach as needed.								
Action Taken								
Household Chores & Childcare								
Taking the lead in household chores and childcare 5	Doing them together / Enjoying household chores and childcare							
Rethinking the division of household chores 6	Are there any signs of fatigue or dissatisfaction?							
Husband does the same amount of housework as wife 7	Efficiency and burden of housework and childcare							
Both partners cooperate on everything 8	Expressing appreciation							
Husband tries doing household chores and childcare alone. 8	Understanding the hardships and expressing gratitude							
To reduce barriers to cooperation								
Avoiding Fixed Ideas 13	Viewing things broadly and objectively							
Do not criticize values 15	Respect values without needing to share them							
※ The values in the implementation section indicate the numbers of the 15 items in the Couple Parenting Recognition survey								
After implementation, couples will self-assess the 15 items of couple parenting awareness again								
Aim for a score of 4 or higher on items where both partners feel it applies (for IV, aim for 2 or lower on reverse items)								
Communicate more often and occasionally take action based on what you remember!								
Good job!								

STUDY 2

Purpose

Study 2 aimed to evaluate the effectiveness and impact of the final version of the Recognition and Implementation Evaluation Sheet by conducting a survey among parents of children aged 6 years and under.

Methods

Survey Period:

The survey was conducted from June 6, 2025, to September 5, 2025.

Survey Method:

A web-based survey was conducted via Internet research using the self-service online survey tool Freeasy.

Survey Participants:

To recruit participants (parents of children aged 6 years and under), we first conducted a nationwide survey targeting fathers aged 27–41 years and mothers aged 25–39 years. Couples willing to participate together were then selected. Ultimately, we included 473 participants.

Survey Overview:

When requesting participation, we presented the program as a means of enhancing couple parenting by exploring it from four key perspectives. The goal was for couples to reflect together on their parenting and “raise children jointly.” Given the high number of smartphone users among the respondents, three different images of the survey sheets were uploaded for screen readability, as mentioned above. The participants were instructed to review the content, save the images, follow the image procedures, and execute all items together as a couple. Procedures 1 and 2 involved question-based execution. The 14 remaining items, which cover both execution content and objectives, were divided into two sets, each to be executed continuously for two weeks. After the implementation period, we conducted a survey using the shortened 15-item Couple Parenting Awareness Scale and the full version, that is, the finalized Recognition and Implementation Evaluation Sheet. Table 4 presents the survey period and content. The New Male Role Scale and the Joint Action Scale surveys were also considered, with their content and results still being analyzed in a separate paper.

Table 4: Survey Period and Content for Study 2

Survey	Web survey Distribution	Responses	Survey Period Survey Content	Response Method	Number of Responses
Screening	Female (Wife)		June 6, 2025 – June 7, 2025		1000
	Male (Husband)		June 6, 2025 – June 7, 2025		1000
		Wife/Husband	Preschool-aged children	Two-choice	
		Wife/Husband	Short Version Couple Parenting Perception Scale	5-point rating scale	
		Wife/Husband	New Male Role Scale	7-point scale	
		Wife/Husband	Cooperation and Functioning Scale	4-point scale	
This Survey First	Men/Women		July 4, 2025 – July 17, 2025		1121
		Wife/Husband	Reflecting on Parenting Life	Two-choice	
		Wife/Husband	Couple Parenting Initiatives Survey Cooperation	4-choice	
Session 2	Men/Women		July 29, 2025 – August 11, 2025		473
		Wife/Husband	Short Version Couple Parenting Perception Scale	5-point rating scale	
		Spouse	New Male Role Scale	7-point scale	
			Cooperation and Functioning Scale	4-point scale	
			Program Initiatives	4-week implementation	
3rd Session	Men/Women		August 27, 2025 – September 5, 2025		413
		With Your Spouse	Spouse's age and occupation		
		Their Spouse	Short Version Couple Parenting Perception Scale	5-point rating scale	
			New Male Role Scale	7-point scale	
			Cooperation and Functioning Scale	4-point scale	
			Thoughts on the Program	Selection	
			Emotions during the initiative	Selection and description	
			Sheet Evaluation	Description	

Research Methods:

We asked the participants to complete a 5-point scale assessment before and after the intervention to assess the applicability of the 15-item Short-form Couple Parenting Perception Scale. We analyzed program changes and effects to confirm the validity of the implementation points. Additionally, to evaluate the finalized evaluation sheet, we encouraged the participants to freely describe the sheet's readability, clarity, and implementation period, as well as suggestions and any other thoughts (within 300 characters). All evaluation descriptions were considered for reference.

Scales and Survey Items used in the Survey

Abbreviated Version of the Couple Parenting Perceptions Scale:

The Couple parenting Perceptions Scale is a 29-item tool that assesses the couple's perceptions of their cooperation in childrearing. The scale consists of four subscales: “Consideration and

appreciation for the other,” “Communication between the couple,” and “Things that hinder couple parenting” (Yoshiko Shimizu and Nobuhiko Suganuma, 2023a). Subsequently, a survey was conducted using a Abbreviated Version of the Couple parenting Perceptions Scale consisting of 15 items and 4 factors, with confirmatory factor analysis revealing that the following factor names and items (Cronbach’s alpha coefficient): “emotional support for each other” with 4 items (.84), “specific support for each other” with 4 items (.84), “emotional support for each other” with 4 items (.84), “agreement and negotiation of parenting” with 3 items (.73), and “difficulties in sharing responsibilities” with 4 items (.77). The scale was designed as a Abbreviated Version of the Co-parenting Perceptions Scale (Yoshiko Shimizu, 2023b). Each item was rated on a 5-point scale from “1” (“does not apply to me”) to “5” (“does apply to me”), with higher scores indicated higher couple’s perception of parenting in childrearing.

Analysis Methods:

Individuals who provided insincere responses or nonmeaningful descriptions were excluded from the final survey sample. The statistical analysis software SPSS version 28 was used, employing nonparametric tests. To compare the effects of the trial and final versions of the Recognition and Implementation Evaluation Sheet and align the data groups, we designated individuals scoring at or below the 25th percentile on the pre-intervention Couple Parenting Awareness Scale as the low-parenting-level group for the analysis. Moreover, free-response comments from 255 couples were analyzed using the same perspective as Study 1.

Ethical Considerations:

Both Study 1 and Study 2 clearly stated in the survey request letter that participation was voluntary and that respondents would remain anonymous. The questionnaire included a checkbox to confirm consent. This study was reviewed and approved by the Nagoya University of Arts and Sciences Ethics Committee (Approval No.: 621, Approval Date: October 28, 2022).

Results

We conducted a survey to gauge couples' willingness to participate. Of the 473 willing individuals, the analysis focused on the free- form response answers provided by 255 husband-or-wife pairs whose responses were deemed valid. which were then used for the analysis. In our quantitative analysis, the attributes of wives ($n = 169$) in the low-parenting-level group were as follows: mean age, 34.3 ± 4.0 years; full-time employees, 89 (51.4%); full-time homemakers, 45 (26.0%); part-time/casual workers, 27 (15.6%); contractual/temporary workers, 6 (3.5%); self-employed/freelancers, 4 (2.4%); and others/unemployed, 2 (1.2%). With regard to the husbands ($n = 172$), the attributes were the following: mean age, 35.3 ± 4.0 years; full-time employees, 161 (91.5%); self-employed/freelancers, 5 (2.8%); contractual/temporary workers, 2 (1.1%); part-time/casual workers, 1 (0.6%); stay-at-home husbands, 5 (2.8%), and others/unemployed, 1 (0.6%). Moreover, the mean number of children was 1.6 ± 0.7 , with the mean age of the youngest child being 2.5 ± 1.9 years.

Changes in Short-Form Couple Parenting Perception Scale Scores After Program Implementation:

—Effects by Intervention Type—

In the 2025 survey using the completed (finalized) version of the Recognition and Implementation Evaluation Sheet, the reliability coefficients (α) for the scale items of the

Couple Parenting Perception Scale (pre- to post-intervention) were 0.86–0.88, 0.76–0.70, 0.62–0.71, and 0.62–0.75 for the key items “Mutual Emotional Support,” “Mutual Concrete Support,” “Parenting Agreement and Negotiation,” and “Shared Responsibility and Difficulties,” respectively. Reversed items were processed accordingly. Given the differences in scale numbers, the scale scores were averaged. As mentioned, the program's goal is to promote couple parenting, with specific objectives set for each item during implementation. To verify its effectiveness, we analyzed changes in 5-point rating scores before and after the program for each of the 15 items.

In the program implementation evaluation using the completed version of the Recognition and Implementation Evaluation Sheet, 11 out of 15 subitems from the shortened Couple Parenting Scale showed significantly higher scores. Specifically, “Mutual Emotional Support” showed significant changes in all its four sub-items: “The husband cares about his wife,” “The husband tries to understand what his wife wants,” “The husband is considerate of his wife,” and “The husband listens to his wife.” Significant changes were also observed in three items of “Mutual Concrete Support”: “The husband naturally helps with housework and childcare,” “The husband is motivated and always thinks of better ways,” and “The husband actively listens to his wife.” For “Parenting Agreement and Negotiation,” two items showed significant changes: “They mutually remind each other and discuss things as they arise” and “They express feelings and opinions verbally to each other.” Furthermore, two items in “Shared Responsibility and Difficulties” showed significant changes: “The husband strongly believes in the idea that ‘men work, while women take care of the home’” and “The wife wants to consult and share with her husband, but he does not share this view.” Meanwhile, in the program based on the trial version of the evaluation sheet, scores significantly increased in three sub-items: “The husband is motivated and always thinks of better ways” in “Mutual Concrete Support”; “They express feelings and opinions verbally to each other” in “Parenting Agreement and Negotiation”; and feeling a difference in values between the husband and wife in “Shared Responsibility and Difficulties.” With respect to the four scale items, the finalized evaluation sheet showed significant increases across all such scale items, whereas the trial version showed increases only in two (“Mutual Concrete Support” and “Parenting Agreement and Negotiation”) (Table 5).

Table 5: Changes in Scores Based on Differences in Couple Parenting Program Implementation Methods

Item	Final Version Perception/Evaluation Sheet Survey (2025) N=349								Survey based on the trial version recognition and implementation evaluation sheet (2024) N=278							
	Before Implementation				After Implementation				Before Implementation				After Implementation			
	MEDIAN	MEAN	SD		MEDIAN	MEAN	SD	p1	MEDIAN	MEAN	SD		MEDIAN	MEAN	SD	p1
F1	The husband cares about his wife	3.00	3.38	0.97	4.00	3.54	1.06	.012 **	3.00	3.23	1.18		3.00	3.27	1.19	.708
	The husband tries to understand what his wife wants	3.00	3.19	1.02	4.00	3.39	1.04	.006 **	3.00	2.90	1.13		3.00	3.03	1.15	.092
	The husband is considerate of his wife	3.00	3.32	0.99	4.00	3.53	0.99	.002 **	3.00	3.22	1.09		3.00	3.36	1.09	.078
	The husband makes an effort to listen to his wife	3.00	3.30	0.98	4.00	3.45	1.09	.023 *	3.00	3.08	1.11		3.00	3.17	1.09	.267
F2	The husband naturally helps with both housework and childcare.	3.00	3.39	1.00	4.00	3.58	1.09	.003 *	3.00	3.18	1.12		3.00	3.27	1.12	.239
	The husband helps and shows consideration so his wife doesn't get	3.00	3.20	1.04	4.00	3.31	1.08	.088	3.00	3.08	1.10		3.00	3.17	1.12	.299
	The husband is motivated and always thinking of better ways to do things	3.00	3.14	0.99	4.00	3.32	1.04	.010 **	3.00	2.95	1.03		3.00	3.14	1.06	.005 **
	My husband cooperates with everything without saying a word or complaining.	3.00	3.15	1.08	4.00	3.26	1.05	.092 *	3.00	2.99	1.05		3.00	3.09	1.14	.205
F3	We try to give each other gentle reminders and discuss things as they come up.	3.00	3.19	1.00	4.00	3.39	1.02	.002 *	3.00	3.02	1.06		3.00	3.12	1.08	.178
	They express their feelings and opinions verbally to each other.	3.00	3.28	1.01	4.00	3.40	1.01	.066 *	3.00	3.06	1.00		3.00	3.23	1.08	.012 *
	Even when entrusted with tasks, my wife makes an effort to listen to my opinions.	3.00	3.33	1.01	4.00	3.41	0.95	.150	3.00	3.07	0.99		3.00	3.19	0.98	.075
	Husbands spend little time interacting with their wives.	3.00	2.66	1.01	3.00	2.77	1.04	.182	3.00	2.66	1.05		3.00	2.68	1.07	.796
F4	The husband strongly believes in the idea that "men work, women take care of the	3.00	2.81	1.13	3.00	3.08	1.20	.001 **	3.00	3.06	1.16		3.00	3.08	1.19	.840
	I wish we could discuss and share things as a couple, but my husband doesn't see it	3.00	2.83	0.98	3.00	3.00	1.07	.021 *	3.00	2.85	1.04		3.00	2.93	1.07	.285
	I feel a difference in values between my husband and wife.	3.00	2.64	0.97	3.00	2.77	1.03	.080	3.00	2.54	1.05		3.00	2.76	1.02	.005 **
F1	Mutual Emotional Support	3.25	3.30	0.79	3.50	3.48	0.87	.000 **	3.00	3.11	0.94		3.25	3.20	0.97	.146
F2	Mutual concrete support	3.25	3.22	0.79	3.25	3.36	0.80	.001 **	3.00	3.05	0.85		3.25	3.17	0.89	.010 *
F3	Agreement and negotiation on child-reari	3.33	3.27	0.76	3.33	3.40	0.78	.001 **	3.00	3.05	0.83		3.33	3.18	0.86	.016 *
F4	Shared Responsibility and Difficulties	2.75	2.73	0.74	3.00	2.90	0.79	.006 **	2.75	2.78	0.75		3.00	2.86	0.78	.189

p1: Wilcoxon signed-rank test *p < .05 **p < .01

2025: Efforts using the final version sheet 2024: Efforts using the intervention questionnaire format (based on the trial version awareness and implementation evaluation sheet)

Table 5 presents a comparison of couples, who were also participants in the 2024 survey, using the shortened version of the Couple Parenting Scale before and after the initiative, based on the trial version of the evaluation sheet.

Evaluation of the Final Version of the Recognition and Implementation Evaluation Sheet:

Participants' free-form responses as their evaluation of the finalized sheet were considered from a broader perspective, incorporating new viewpoints, problem-solving, and decision-making, thereby allowing all evaluations to inform potential solutions and better outcomes. The sheet's value can be possibly determined according to positive aspects and outcomes. Among 510 respondents, 439(99.2%) gave high ratings and 77 (14.9%) gave low ratings (χ^2 test $p = .000$). For high ratings on overall visibility (ease of confirmation when viewed), "no issues" was overwhelmingly the most common response (248 participants), followed by "good" (16 participants). For legibility/readability, 57 evaluated it to be "easy to understand/easy to see," and 4 described it to be "detailed."

For implementation/effectiveness/expectations, 25 reportedly observed a "change in awareness," and 14 claimed it be a "harmonious/good opportunity." Conversely, the most common reasons for low ratings were "too many items," "unclear," and "troublesome" by 15, 10, and 4 participants, respectively (Table 6).

Table 6: Evaluation of the Final Version Recognition and Implementation Evaluation Sheet (Multiple Answer)

High Rating Total 439count	Low Rating Total 77count
Overall visibility	Overall visibility
No particular issues/No problems 248, Good 16, Good initiative 5, Adequate 4, Excellent 3, Simple 2, Important point 2, Clear action purpose 2, Well-balanced 1, Well-done 1, Worth doing 1, Interesting 1, Accurate 1, Total 287count	Don't know 10, Confused 1, This isn't everything 1, Complicated 1, Demotivating 1, Too many 1, Prefer a clear layout 1, Prefer intuitive 1, Troublesome 1, Total 17count
Visibility, readability, legibility	Visibility, readability, legibility
Easy to understand/clear 57, Well-broken-down 4, Easy to implement 3, Easy to read/simple to start 2, Easy to answer 3, Easy to fill out 2, Easy to compare values 2, Total: 71count	Too many items 15, Hard to understand 4, Table is too detailed and hard to read 8, Too nitpicky 3, Questions were unclear 3, Text is too small 2, Too much text 2, No criteria makes judgment hard 1, Complex 1, Total 39count
Execution, Effectiveness, Expectations	Execution, Effectiveness, Expectations
Change in awareness 25, Led to marital harmony 14, Understood opinions 13, Made me think 5, Provided insights 5, Useful reference 2, Enabled reflection 2, Broadened perspective 1, Resolved dissatisfaction 1, Enjoyable 5, Good experience 3, Want to tackle later 2, Fresh perspective 1, Made things visible 1, Total 81count	Troublesome 4, Difficult 3, Takes time and I forget to be mindful 3, Hard 3, No time 3, No room to do it 1, Female perspective 1, Some things can't be changed 1, Answers are as intended 1, Hard to speak honestly 1, Total 21count

DISCUSSION

Program Effectiveness Using the Final Version of the Recognition and Implementation Evaluation Sheet

Regarding the implementation period, prior research (Shimizu Yoshiko, 2025a) demonstrated the effectiveness of continuity. In a program using the evaluation sheet's trial version, where participants worked on four perspectives over one week (Shimizu Yoshiko, 2024), significant changes were only observed in two scale items: "Mutual Concrete Support" and "Parenting Agreement and Negotiation." Regarding the "Shared Responsibility and Difficulties" item, only the perception of differences in values between the husband and wife showed a significant change. However, when the sheet's final version was used, improvements in couple parenting showed significant increases in 11 out of 15 sub-items and all four scale items. Interventions based on the sheet's trial version showed significant increases in only 3 out of 15 sub-items, with no significant improvements in "Mutual Emotional Support" and "Shared Responsibility and Difficulties." Notably, "Shared Responsibility and Difficulties" obtained the lowest scores among the four scale items and acted as a negative factor between such items. However, using the evaluation sheet's final version significantly increased the scores for "Shared Responsibility and Difficulties," clearly reflecting changes in awareness and mutual understanding. This outcome implies that the significant improvement in mutual emotional support can generate a co-educational effect between partners, encouraging them to share their responsibilities and difficulties with each other. The program, implemented over four weeks (two weeks each for two perspectives) using the finalized evaluation sheet, was verified to be highly effective. After the intervention, scores for "My husband strongly believes 'men work, while women manage the home'" and "I wish we could discuss and share more as a couple, but my husband doesn't think that way" significantly increased. The observed changes in awareness and recognition of consultation and sharing suggest that reducing the number of items addressed while extending the program duration could further promote mutual emotional support. This promotion would deepen educational effects based on mutual

respect for values and awareness, leading to improved scores. Furthermore, no evaluations indicated that the four-week period was too long, confirming the validity of the Recognition and Implementation Evaluation Sheet's final version.

While scores can be visualized and evaluated, the mutual evaluation process aimed to foster understanding of each other's feelings and build a relationship in which they could discuss anything. However, some evaluations became a source of conflict, suggesting that visualizing mutual evaluations itself challenges the couple's communication skills.

The significant promotion effect observed across all scale items of the Couple Parenting Awareness Scale suggests heightened feelings of trust and respect, likely influenced by co-parenting effects. The promotion effect on "mutual emotional support" indicates that interactions between couples led to changes in cooperation. Laurie A. Van Egren (2015) stated that co-parenting, while navigating, is a two-way process and that its solidarity symbolizes an emotional and enduring quality of parenting, growing together as parents and forming a unified executive subsystem. Co-parenting solidarity is demonstrated through interactions with their child and their shared expression of positive emotions about the child (McHale, 1995). Utilizing the final version of the Recognition and Implementation Evaluation Sheet may have facilitated the achievement of co-parenting effects.

Wives with strong gender role beliefs clearly have husbands with lower levels of childcare involvement (McBrid BA et al., 2005), underscoring the challenge that the wife's mindset hinders the husband's cooperation with housework and childcare. This program demonstrated that positive effects on husbands' awareness and behavior promote co-parenting, suggesting that gender role perceptions have changed. Compared with the 2005 study, the 2024 study showed that the roles expected of men and women are becoming less rigid and that wives' awareness has significantly shifted. However, husbands' awareness has not yet caught up (Cabinet Office, 2025). Notably, husbands' gender role perceptions tend to be more rigid and less changeable as their age advances. Therefore, the dynamics between couples is anticipated to significantly transform in the future as generations transition.

Evaluation of the Final Version of the Recognition and Implementation Evaluation Sheet

Implementing the program consolidated onto a single sheet was feasible without the need for a third-party intervention. However, simply distributing the sheet and ending there, a one-way approach, might be less effective than having participants write evaluations and reflections, given that feedback from a third party can be motivating. While implementing the program itself has been proven effective, gaining knowledge about the content through third-party feedback can offer additional benefits. Therefore, we aimed to explore scenarios where third-party involvement becomes possible for broader dissemination.

Couple parenting refers to spouses mutually supporting each other in child-rearing and cooperating to provide their children with a stable upbringing environment. We aim to promote the idea that "joint efforts by couples build harmonious relationships and greatly positively impact children's growth." Hence, active participation by both partners is a prerequisite. The program gained support, likely stemming from the view that "this is something worth spreading."

The questionnaire item “Husbands naturally help with housework and childcare” was derived from qualitative research during scale development. However, it may reflect the outdated notion that husbands work while wives handle housework and childcare. With dual-income households now considered as the norm, husbands are expected to not merely “help” with housework and childcare but actively participate in such tasks together with their spouses. If the goal of couple parenting is for spouses to jointly raise children, the phrasing “naturally helping with both housework and childcare” might convey that husbands should adopt a stance of merely assisting. Therefore, we propose revising the scale item to “husbands naturally perform housework and childcare.” Additionally, we will review the comments provided (omitted because of space constraints) and finalize the sheet after minor revisions. This survey demonstrated that the final version of the Recognition and Implementation Evaluation Sheet has significantly improved visibility. Furthermore, it showed that 85% of the respondents, including those who made suggestions, provided high ratings, indicating broad acceptance. Compared with the trial version, which addressed four items over one week, the final version had fewer low-rated items, even considering the actual implementation period (4 weeks total) and the items tackled (2 items split into 2 sessions). The final version also resulted in higher overall scores for the subscale items and a greater number of sub-items with significantly higher scores, demonstrating higher effectiveness.

However, regarding the low-rated content, 15% of the respondents cited issues such as “difficult to understand” and “too many items,” similar to the trial version. Notably, a very small number mentioned “difficulty expressing true feelings” and “lack of time.” Reducing these low-rated items remains a challenge. Nonetheless, a certain level of low ratings is unavoidable, reflecting the inherent difficulty in promoting couple parenting. These negative elements need to be improved.

Promotion of the Couple Parenting Promotion Program

To promote the Couple Parenting Promotion Program, we believe that we need to finalize the pamphlet and upload it to the website for dissemination.

Design is crucial for creating the pamphlet. Designers Klenner, Gemser, and Karpen (2022) demonstrated a value system focused on “pursuing social goals centered on others rather than personal gain.” In line with this perspective, we aim to incorporate the desired messages and information in the pamphlet through a design that meaningfully engages parenting couples. For distribution, we plan to publish the finalized pamphlet in PDF format on our website, allowing users to download it from the web or print it for use.

Limitations and Challenges of the Study

A key limitation of this study is that the intervention was conducted online rather than face-to-face. While the program requires cooperation between couples, verifying whether participants actually followed the instructions relies largely on the partner's attitude, as well as self-reported questionnaire responses. Furthermore, given that the survey was web-based, the partner might answer the spouse's section without permission. Managing the reliability of respondents by the web survey provider has also corresponding limitations. Therefore, the researchers collected a large number of responses and carefully judged which answers were reliable.

CONCLUSION

By using the finalized sheet, the “Shared Responsibility and Difficulties” scores significantly increased, clearly yielding changes in awareness and mutual understanding. Therefore, significant improvement in mutual emotional support may strengthen co-parenting, leading to the enhanced sharing of responsibilities and difficulties. In conclusion, using the finalized Recognition and Implementation Evaluation Sheet verifies the program's effectiveness over a total of 4 weeks (2 weeks from each perspective). This research was conducted under the Ministry of Education, Culture, Sports, Science and Technology (MEXT) Grant-in-Aid for Scientific Research (C) “Development and Evaluation of a Couple Parenting Promotion Plan” (Grant No.: 22K10939) from 2022 to 2025. We/The authors thank Crimson Interactive Pvt. Ltd. (Enago) - www.ulatus.jp for their assistance in manuscript translation and editing.

Conflict of Interest

There are no conflicts of interest in the conduct of this research.

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