

Research Article

Identifying Factors Associated with Depressive Symptoms in Japanese Fathers Who Try to be Actively Involved in Childcare: A Web-based Cross-Sectional Study

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Abstract

This study aimed to identify the factors contributing to depression in Japanese fathers who tried to be actively involved in childcare and examine whether support through raising awareness is effective. Between February and March of 2019, web-based questionnaire was administered to 212 fathers who voluntarily participated in a childcare support group. Multiple regression analyses demonstrated that feelings for children, number of working hours, and kind of working environment were significantly associated with their depressive symptoms. Multiple regression analyses using Center for Epidemiologic Studies Depression (CES-D) scores revealed that the following factors contributed significantly to their depressive symptoms: overall health, self-efficacy, affection for children, work-related factors, and mental and physical health. These results suggest that although fathers want to be actively involved in childcare, they develop depression due to long working hours, less free time, and shorter sleep duration. Taking these findings into consideration, fathers should receive support in childcare.

Keywords: Fathers, Involvement in Childcare, CES-D, Depression, Cross-Sectional Study.

Introduction

The involvement of fathers in childcare is essential. Studies overseas have reported that fathers who, rather than simply providing support for the mother, assist in looking after the child as a core component of the child's upbringing, providing emotional support, and assuming the responsibility of an educator have a positive influence over the child's development [1-4]. Fathers' active participation in childcare is also recommended in Japan; however, progress in this regard has not been evident.

An obstacle to fathers' participation in childcare includes less time spent at the home due to long working hours. According to a survey conducted by the Gender Equality Bureau Cabinet Office, the proportion of regularly employed couples has exceeded 50% since 1996; however, the proportion of men in their 30s and 40s who work more than 60 hours per week remains high [5]. The proportion of couples who take advantage of systems in place for paternity leave post-childbirth is on the rise; however, the proportion of men taking such leave remains low ($\leq 8\%$ according to the Ministry of Health, Labour and Welfare) [6].

In Japanese families where husbands are not involved in childcare, trends toward nuclear families have promoted the isolation of mothers parenting at home and the requirement of fathers to provide even greater instrumental

and emotional support for mothers [7]. With the increasing number of dual-earner couples in Japan, fathers are encouraged to be involved in parenting by equally sharing the responsibility with mothers rather than as supporters of the childcare [8]. While attitudes toward fathers becoming involved in parenting have changed, many fathers still do not play a key role in parenting. Instead, working mothers are forced to do both childcare and housework, or in other words "solo parenting," which has become a social issue in Japan [9]. The number of cases of child abuse has been increasing. Furthermore, the proportion of fathers committing such crimes has been increasing [10]. While some fathers want to be actively involved in parenting but face difficulties due to the nature of their jobs, others have little interest in childcare and housework even after taking childcare leave. Even if fathers want to be actively involved in childcare, the accomplishment of such a goal is difficult without support [11,12]. Moreover, fathers face difficulties in maintaining balance between childcare and work [13]. The other obstacle to fathers' participation in childcare is their mental health. In 2005, postpartum depression in fathers was reported in *the Lancet*, and since then, the condition has been reported globally [14,15]. In Japan, the Edinburgh Postnatal Depression Scale and the Center for Epidemiologic Studies Depression Scale (CES-D) have been widely used to evaluate depressive symptoms. The proportion of fathers with depression is similar to that of mothers (approximately 13%) [16]. However,

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the onset period of postpartum depression varies between fathers and mothers. Mothers often develop depression soon after birth, whereas fathers frequently experience depression 3–6 months after the birth of their children [12]. In Japan, the average number of working hours of fathers during the childcare period is high. Therefore, fathers who try to be frequently involved in childcare tend to overwork at home and workplace, thereby predisposing them to depression [17].

Fathers are likely to develop perinatal depression, resulting in poor mental and physical health [18]. In addition, fathers who experience perinatal depression have common problems, including low income, lack of people they can rely on after the birth, stress, smoking, low self-esteem [19–21], poor working environment, and low sense of accomplishment and joy when witnessing the birth of their child [22]. In Japan, suicide is the leading cause of death in men aged 20–45 years during the childcare period [23]. It is possible that men during this period try to accomplish their roles in the workplace and at home while also trying to cope with mental illnesses; however, few studies have evaluated the relationship between childcare and depression in fathers [24]. This study aimed to clarify the factors associated with depression in fathers actively involved in childcare and investigate their effect on the relationship between the fathers and their partners.

Participants and Methods

Study design

This was a cross-sectional study that employed a web-based questionnaire using an online survey application.

Study period

February 18, 2019 to March 24, 2019.

Participants

Fathers from across Japan who were registered members of a nonprofit organization and related groups that support fathers engaged in childcare were included. The fathers paid an annual membership fee as members of the organization and were seeking to be proactively involved in childcare. These fathers were defined as “fathers who are actively involved in childcare.” This is the largest Japanese nonprofit organization of its kind and was established in 2007 with the slogan “be a father with a smile.” It operates several projects open to the public to support fathers engaged in childcare. In this nationwide survey, a questionnaire was sent to the members of this organization via e-mail. Of the responses obtained for the questionnaire, only few responses with incomplete answers were included in the analysis.

Questionnaire

1) Questions on subject characteristics

Questions on “age,” “sex,” “Number of children,” “Children’s age groups” (multiple answers allowed) “Daily working hours” (including commuting time) “Employment,” “Housework time,” “Involvement in childcare” were included.

2) Questions on “childcare,” “children,” “marital relationship,” “burdens on childcare and housework,” and “working environment.”

The questionnaire used in this study was developed based on the questions asked in a previous study, Center for Early Childhood Development, Education, and Policy Research (CEDEP) [25]. A higher score represented positive feelings toward childcare and children with scores adjusted for couples with a good marital relationship. Because the age of the participants in our study differed from that of those in the study conducted by CEDEP, which included only parents with infants younger than 12 months, we selected the following five domains that are not affected by the age of the children: 1) childcare (10 items regarding specific burdens of childcare), 2) children (6 items regarding fathers’ feelings toward children), 3) marital relationship (9 items about verbal communication, such as exchanges and appreciation between couples), 4) burdens of childcare and housework (7 items assessing life-related burdens, such as housework and economic situations),

and 5) working environment (9 items about self-discretion, boss’ understanding of fathers’ participation in childcare, and workload). The total score of each item was calculated, with a higher score representing positive feelings. The total scores of each item and each question group were used as variables for further analyses.

3) Mental and physical health

The Short-Form 8 Health Survey (SF-8) is the abridged version of the Health-Related Quality of Life SF-36v2 [26–28]. This scale can evaluate eight domains of health. Our study employed the standard version of SF-8, which uses a one-month recall period. SF-8 was used as a comprehensive scale, with a higher score indicating a better health status.

4) The Center for Epidemiologic Studies Depression Scale

The 2012 version of the CES-D, which was developed by Shima, was used. This scale consists of 20 items, including 4 reverse-scored items [29]. The total score, which is calculated after adjusting the four reverse-scored items, ranges from 0 to 60. A higher score indicates stronger depressive symptoms. The cutoff point is set at 16.

5) The General Self-Efficacy Scale

The General Self-Efficacy Scale developed by Sakano et al., was used to evaluate self-efficacy, which is defined as “expectations that one can successfully execute a course of action.” The total score ranges from 0 to 16 points [30]. A higher score on the 5-point scale indicates higher self-efficacy. The degree of self-efficacy in adult males is categorized into extremely poor (≤ 4 points), poor (5–8 points), normal (9–11 points), good (12–15 points), and very good (16 points).

6) The abridged version of the Scale of Egalitarian Gender Role Attitudes

A gender role attitude is defined as “a learned tendency, which consistently responds favorably or unfavorably to certain gender roles.” Egalitarianism is defined as “a belief in gender equality at an individual level.” A higher score on the abridged version of the Scale of Egalitarian Gender Role Attitudes [31] represents a more egalitarian attitude toward gender roles and a lower score indicates a more traditional attitude toward gender roles. In our study, a higher score was more frequently observed in women than in men, in employed women than in unemployed women, in highly educated participants than in low-educated participants, and in young participants than in old participants. Reliability coefficient was $\alpha = 0.91$, and construct validity was evaluated.

Analyses

Regarding subject characteristics, descriptive statistical analysis was performed and correlation coefficients between the total CES-D score and each variable were calculated. Furthermore, multiple regression analysis using forced entry was performed using the CES-D score as the dependent variable. Scores of each scale were calculated.

Original questions (i.e., those related to childcare, children, marital relationship, burdens on childcare and housework, and working environment) were linked to each item of CES-D based on their similarity and were represented as the total score of CES-D. Three participants who had many incomplete answers were excluded from the analysis. Further, questions with no answers from the remaining participants were treated as missing values and were also excluded. The statistical analyses were performed using SPSS version 27.

Ethical considerations

This study was performed after obtaining approval from the Ethics Review Committee of Saka Kyoiku University (Assessment Report 373). After explaining the survey’s purpose to each organization and obtaining approval, a questionnaire was sent to the members of the organization via e-mail. An explanation of the survey and protection of personal information was described on the first page. It was clearly

stated that participation in the survey was voluntary, with no adverse consequences for declining participation. Appropriate permissions for the use of the scales and questions were obtained.

Results

Subject characteristics

Table:1 presents subject characteristics. We distributed the questionnaire to 346 participants via e-mail using the mailing list of members from the branch offices of the organization across Japan. Responses were obtained from 215 participants (response rate: 62.3%). Among them, 212 participants were included in the analysis (three participants who had provided many incomplete answers were excluded). The mean age of fathers was 42.6 ± 6.1 years, that of their partners was 41.4 ± 5.7 years, and the average number of their children was 2.2 (**Table 1**). Many respondents spent 2–4 hours on housework and childcare on weekdays. Most participants had ≥ 10 daily working hours (48.4%). Approximately 50% of the participants' partners were full-time employees. The mean score for self-efficacy was 11.1 ± 4.0 , which was classified as "normal" (i.e., 3 points on a 5-point scale). In terms of the scale of Egalitarian Gender Role Attitudes, the mean score in our participants was remarkably higher than that in highly educated men (i.e., those with a university degree or higher education) (55.9 ± 5.8 vs. 46.8 ± 10.2). In other words, our participants tended to not have stereotypical gender role attitudes. The CES-D score was slightly higher than the Japanese average (8.3 vs. 7.9). CES-D score < 16 (threshold) was found in 173 participants [15]. In addition, 38 fathers (17.5%) had severe depressive symptoms and CES-D score ≥ 16 .

Table - I Subject Characteristics

Variables	Categories	N	%	M (\pm SD)%	Actual range
Age (years)				42.6 (\pm 6.1)	
Number of children				2.2 (0.75)	1–4
Children's age groups (multiple answers allowed)	1. Infants	17	8	2.2 (\pm 0.8)	
	2. Preschool (age \geq 1 year)	139	60.8		
	3. Elementary school	121	57.1		
	4. Junior high school	49	23.1		
	5. High school	34	16		
	6. University/other	23	10.8		
Daily working hours (including commuting time)	1. \geq 10 hours	102	48.4		
	2. 9 hours	41	19.5		
	3. 8 hours	34	15.8		
	4. $<$ 8 hours	35	16.5		
Employment	1. Regular employment	141	66.4		
	2. Self-employment	41	19.1		
	3. Leave of absence	5	2.3		
	4. Other	26	12.2		
Housework time	1. Weekday (most frequency) 1–2 hours	60	28.3		
	2. Holiday (most frequency) 2–4 hours	84	39.6		
Involvement in hours childcare	1. Weekday (most frequent time) 2–4	61	28.6		
	2. Holiday (most frequent time) 10–15 hours	60	28.3		
*1GSE				11.1 (\pm 4.0)	0–16
*2SESRA-S				55.9 (5.8)	33–69
*3CES				8.3 (\pm 8.1)	0–50
*4SF-8				16.2 (\pm 5.8)	7–37

*1: General Self-Efficacy Scale; *2: Scale of Egalitarian Sex Role Attitudes; *3: Center for Epidemiologic Studies Depression Scale; *4: Short-Form 8

Relationships between the CES-D Score and each Scale and Question Group

Table 2 presents the association of the CES-D score with each scale and question group. In participants with higher CES-D scores, variables inversely associated with the CES-D score included the total SF-8 score, which represents the health-related quality of life (QOL), mental QOL, physical QOL, self-efficacy, and happy feelings. In addition, more depressive symptoms were associated with worse health status. Further, CES-D scores were associated with feelings for the child, attitudes toward parenting, marital relationship, burdens of work and life, sleep duration, and leisure. However, CES-D scores were not significantly associated with housework hours, parenting hours, and scores of the Scale of Egalitarian Gender Role Attitudes.

Table - 2 Correlation of CES-D (Depression Symptoms) with Scales and Domains

Variables	Pearson's coefficients	correlation p-value
Age	0.067	0.338
Partners' age	0.094	0.181
SF-8*	-0.571	0.000
PCS*	-0.228	0.000
MCS*	-0.557	0.000
Gratitude for children**	-0.244	0.000
Feelings for parenting**	-0.430	0.000
The scale of Egalitarian Sex Role Attitudes *	-0.079	0.250
Burdens on housework*	-0.062	0.367
Burdens on work*	-0.068	0.325
Financial burdens*	-0.365	0.000
Marital relationship**	-0.332	0.000
Self-efficacy*	-0.563	0.000
Burdens on housework and work*	-0.319	0.000
I feel happy**	-0.402	0.000
Total burdens on work**	-212	0.002
Difficulty in maintaining balance between childcare and work**	-0.225	0.001
Spending time with children (holiday)	-0.144	0.037
Marital conversations (weekday)	-0.152	0.031
Marital conversations (holiday)	-0.141	0.046
Working hours	-0.189	0.007
Sleep duration**	-0.307	0.000
Household budget**	0.390	0.000

*A higher score indicates a better result

**A lower score indicates a better result

Multiple Regression Analysis for Determining Factors Associated with Depressive Symptoms

Multiple regression analysis using forced entry was performed using the total CES-D score as the dependent variable and items related to subject characteristics and other questions as the predictor variables **Table 3**. The results showed that the following parameters were significantly associated with depressive symptoms: the total SF-8 score, physical component summary, mental component summary, self-efficacy, and happy feelings. In addition, work-related variables were extracted, such as working hours, difficulty in maintaining a balance (between home life and work), work environment, and free time (weekdays).

Table - 3 Multiple regression analyses for the total score of CES-D

	Regression coefficient β	95% CI	Standardized coefficients	p-value
Age	0.73	(-0.15 to 0.30)	0.57	0.518
Number of children	2.08	(0.08 to 4.07)	0.20	0.420
Partners' work	0.20	(-0.29 to 0.63)	0.05	0.423
Physical component summary	-5.87	(-9.61 to -2.12)	-5.18	0.001
Mental component summary	-5.43	(-8.74 to -2.12)	-4.98	0.001
SF-8 (total)	1.26	(0.44 to 2.10)	6.71	0.003
Sex equality scale	0.01	(-0.16 to -0.18)	0.01	0.911
I feel my child is cute	-3.53	(-6.93 to -0.12)	-0.15	0.043
I feel childcare is stressful	-0.77	(-2.33 to 0.80)	-0.08	0.333
Marital relationship	0.23	(-0.01 to 0.47)	0.16	0.057
Self-efficacy	-0.89	(-1.15 to -0.65)	-0.44	0.000
Burden on housework	1.90	(-0.24 to 4.04)	0.18	0.081
Burden on childcare	-2.01	(-4.02 to 0.01)	-0.21	0.051
Financially stable	-0.77	(-2.10 to 0.56)	-0.90	0.255
Working hours	-1.63	(-2.36 to -0.90)	-0.29	0.000
Housework/ childcare hours (weekday)	1.49	(-0.14 to 3.12)	0.23	0.073
Difficulty in managing balance between childcare and work	1.64	(0.12 to 3.16)	0.18	0.035
Sleep duration	-0.09	(-1.40 to 1.23)	-0.01	0.898
Happiness	2.90	(0.71 to 5.10)	0.20	0.010
Working environment (domain)	0.33	(0.09 to 0.57)	0.18	0.008
Free time (weekday) Conversation time with partner (weekday)	0.63	(-0.96 to 2.22)	0.08	0.435

ANOVA $p = 0.000$ Adjusted $R^2 = 0.706$

Discussion

Characteristics of Fathers in this Study

According to a comprehensive survey of living conditions in 2019, 54.4% of families with children attending elementary school admitted living on a tight budget [32,33]. In contrast, >70% of our participants who were actively involved in childcare reported as being financially stable. Furthermore, only 26.2% of the partners of the respondents of the 2019 survey were regularly employed, while approximately 50% of the partners of our participants were regularly employed, even though 60% of the respondents in the present study had children attending elementary school. The regular employment rate of the partners of our participants was high. Many fathers who were relatively financially stable spent most of their time on the child on holidays, indicating that they had little free time. Given that the age of our participants (both fathers and children) varied, the CES-D score was used to evaluate depressive symptoms. This scale has been used in a wide range of age groups and its reliability and validity have been determined. The correlation coefficient of the CES-D score with the SF-8 total score, mental and physical QOL, and the General Self-Efficacy Scale score was remarkably high, which also showed an inverse correlation. Taken together,

we believe that the CES-D score was a validated index for measuring depressive symptoms. The mean CES-D score of our participants was 0.4 points higher than that of the general Japanese male population, indicating that the daily parenting time of our participants was long. In other words, some fathers were forced to be involved in childcare despite of their busy working schedules.

Factors Associated with Fathers Depressive Symptoms

Work-related factors (e.g., working hours, difficulty in maintaining a balance [between home life and work], and work environment) were extracted. These results suggested that even though fathers tried to be actively involved in childcare, they could not participate in housework and parenting owing to work-related exhaustion. Furthermore, depressive symptoms were associated with their feelings for children (e.g., “I feel that my child is cute”) and happiness. Fathers with negative mindsets tended to have negative feelings for their children. Thus, depressive symptoms in men during the early stage of parenthood may hinder the establishment of their relationship with their families. Men who knew the importance of parenting and tried to be actively involved in childcare worked hard to manage parenting, housework, and work simultaneously; thus, they tended to experience depressive symptoms (i.e., physical and mental discomfort). In 2005, Okamoto reported depressive symptoms in a father with a child aged 1.5 years [34]. The results of the present study demonstrated that symptoms similar to those described in the previously mentioned report were observed in our participants who were of a wide age range and were involved in childcare. Five years after Okamoto’s report was published, the Japanese Government initiated the “*Ikumen Project*” to encourage fathers to participate in parenting by taking childcare leave [35]. The results of the present study demonstrated that measures facilitating fathers’ participation in childcare are still insufficient even for fathers actively involved in parenting. Measures based only on raising awareness will not decrease parenting and housework burdens on mothers and fathers, and improvement in men’s work environments and provision of support focusing on fathers’ childcare will be required.

Nomaguchi et al., used the fragile family data in the U.S. to evaluate marital relationships [36]. The results showed that cooperative coparenting reduces the parenting stress of mothers and that fathers are benefited through their active involvement in parenting because it maintains a favorable marital relationship. To prevent postpartum depression, Kumar et al., reported the necessity of support for relationship building in a marital relationship soon after childbirth. Chu and Lee demonstrated that maternal depressive symptoms affected the quality and quantity of fathers’ involvement in childcare [37,38]. Nath et al., reported that parental unemployment, high maternal depressive symptoms, and marital conflict were risk factors for depressive symptoms in fathers raising preschool children [39]. Planalpha et al., indicated that the levels of maternal depressive symptoms and marital quality were associated with fathers’ participation in childcare [40]. The important finding of the present study was that the method of managing parenting in individuals with busy schedules remarkably differed among the fathers actively involved in childcare. Some of them tried to accomplish tasks in their home lives despite being swamped with work; therefore, they were ultimately overworked. To support mothers with depressive symptoms, the necessity of fathers’ support has been emphasized in Japan. However, fathers who try to be actively involved in childcare may struggle with the dilemma of dividing time between work and parenting. It is important to consider fathers’ mental health when asking them to support mothers. This may prevent further decrease in their self-efficacy and worsening of their depressive symptoms. Companies need to adjust employees’ schedules and job roles according to their parenting duties at home. In addition, an improvement in social infrastructure is required through enriching company culture, improving housework/parenting support programs, and fostering the housekeeping and childcare services industries. Furthermore, support programs for fathers, particularly in fields that they are unfamiliar with, i.e., housework/parenting, are needed.

Study limitation

This study focused only on fathers actively involved in parenting; thus, the sample size was small. Due to this, the differences according to the number of children and their ages could not be highlighted. This cross-sectional study failed to identify a causal relationship between health status and each variable.

Summary

Between February and March of 2019, a nationwide, web-based questionnaire was administered to 212 fathers who voluntarily participated in a childcare support group. Multiple regression analyses demonstrated that the feelings for children, number of working hours, and type of working environment were significantly associated with their depressive symptoms. Multiple regression analyses using the Center for Epidemiologic Studies Depression scores revealed that the following factors contributed significantly to their depressive symptoms: overall health, self-efficacy, affection for children, work-related factors, and mental and physical health. These results suggest that although fathers want to be actively involved in childcare, they develop depression due to long working hours, less free time, and shorter sleep duration, resulting in a dysfunctional relationship with their families. Taking these findings into consideration, fathers should receive support in childcare.

Compliance with Ethical Standards

Conflicts of interests: The authors declare that they have no conflict of interest

Ethical Approval: All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards.

Informed Consent: Informed consent was obtained from all individual participants included in the study

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