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Association of child's disability status with father's health outcomes in Japan

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ABSTRACT

Fathers' involvement in childcare has been increasing in recent years. However, very little is known about the health impact on fathers when they are caring for or living with a disabled child. This study aims to understand the psychological distress and subjective health outcomes among fathers living with a disabled child compared to fathers living without a disabled child. Data for this study were obtained from the Comprehensive Survey of the Living Conditions conducted by the Ministry of Health, Labour and Welfare in 2016. Multivariable logistic regression was used among 438 disabled-child and father dyads and 27,682 non-disabled-child and father dyads to analyse the association between a child's disability status with father's health outcomes. Fathers of disabled children had a higher prevalence of psychological distress (17% vs. 12%) and poor subjective health status (13% vs. 8%) than fathers of non-disabled children. A large proportion of disabled children were boys (70%) and had disability level 1 (47%). After adjusting for covariates, the odds ratio (OR) of having psychological distress (OR, 1.53; 95% CI, 1.19–1.97) and poor subjective health status (OR, 1.78; 95% CI, 1.34–2.36) among fathers of disabled children is significantly higher compared to fathers of non-disabled children. Unemployed fathers had a higher odds ratio of psychological distress (OR, 3.07; 95% CI, 2.49–3.79) and poor subjective health status (OR, 4.90; 95% CI, 3.95–6.09) compared to regular working fathers. Fathers of children with disabilities need greater physical and mental health and wellbeing support. They should be provided with additional support not just for their mental but also their subjective wellbeing.

1. Introduction

There are approximately 150 million children with disabilities in the world. The number of children with disabilities is gradually increasing in Japan with 68,000 children below 18 years receiving a disability certificate in 2016 (Ministry of Health Labour and Welfare of Japan, 2016). They account for 0.3% of the total number of children under 18 years in Japan (Ministry of Internal Affairs and Communications of Japan, 2017) and 1.6% of the total population of people living with disabilities (Ministry of Health Labour and Welfare of Japan, 2016). With the advances in surgical and medical technology, it has been possible for babies born with abnormalities to survive. This increases the number of disabled children and thus, the number of parents caring for these children increases as well. As in most developed countries, the traditional role of Japanese fathers has been that of provider and authority figure (Craig & Mullan, 2011). In Japan, gendered division of labour is common as men tend to engage in paid work and women tend to engage in housework and childcare. The expected role toward Japanese fathers, however, is changing from that of authority figure to caregiver (Terui et al., 2021; Yamazaki, 1980) with social changes such as the increase in the number of nuclear families and workforce participation of women. Fathers have increasingly been expected to

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contribute equally and actively in childcare and household work compared to previous generations. In traditionally collectivist Japanese society, the notion of having a disabled child impose obstacles not only physically but also through society's perceptions (Iwakuma, 2011). Various national and international events such as the Paralympic games and the Great Hanshin-Awaji Earthquake have helped the public in accepting disabled people, thereby positively changing their perspective towards disability (Iwakuma, 2011; Stibbe, 2010). It is important to know how the disability status of children has affected fathers' health outcomes as an increasing number of fathers tend to be involved in caring for a disabled child.

A parent's initial reaction to having a child with a disability is usually associated with negative feelings that can potentially lead to depression and suicide attempts (Kandel & Merrick, 2007). Additionally, several factors such as parents' employment, social support and coping strategies affect the long-term impact of raising disabled children (Sloper & Beresford, 2006) including financial burden (Estes et al., 2009). There is an increase in the burden of child disability on the family as the child needs frequent visits to the hospital to get care and support in their lives. These additional needs of a disabled child may disrupt the parent's employment, marital relationship, and family life as a whole (Christodoulou et al., 2020). In Japan, public support for caregivers, especially parents, is limited (Nakamura, 2019). Parents are not able to spare time for themselves after spending most of their time caring for their disabled child (Barnett & Boyce, 1995; Christodoulou et al., 2020; Mitsubishi UFJ Research & Consulting, 2020), leading to withdrawal from social activities. These parents often consider their health of a lesser priority and are reluctant to seek healthcare (Nam et al., 2010) for themselves, prioritising funds for child-care needs (Bourke-Taylor et al., 2012; Gilson et al., 2018). They have unmet needs such as information, social and financial support, and other community services (Mohd Nordin et al., 2019).

Traditional male lifestyle is associated with risk behaviour (Jenkins, 1998) and men's health might be influenced during the transition to parenthood (Baldwin et al., 2018). The physical and mental well-being of fathers plays a vital role in healthy parenting practices (Mikolajczak et al., 2018). Thus, it is essential to understand the association between a child's disability and a father's health outcome. Caring for children with disabilities has a huge impact on the lives of each member of the family including fathers (Pelchat et al., 1999) yet only a few studies have explored fathers' well-being (Dunn et al., 2019; Giallo et al., 2015). Additionally, these studies did not have a representative sample as they used convenient sampling and had a fewer sample size. Identifying and addressing poor health outcomes at an early stage among fathers is important as delay in treatment might lead to poor outcomes in both them and their children (Yogman & Garfield, 2016). Fathers' well-being has often been compared with that of mothers, with relatively few studies comparing psychological well-being between fathers of children with and without disability (Boyraz & Sayger, 2011; Langley et al., 2020). Comparison with the general child-rearing situation is important in understanding the impact of a children's disability on a fathers' health. This will also help in understanding the specific support measures that might be necessary for fathers in addition to the general parenting support measures which are usually targeted at mothers. Mothers of disabled children have a higher risk of poor physical (Hedov et al., 2000) and mental health compared to mothers of children without disabilities (Yamaoka et al., 2016). Much is known about difficulties and health problems including psychological problems faced by mothers of disabled children (Bourke-Taylor et al., 2012; Singer & Floyd, 2006; Gilson et al., 2018; Yamaoka et al., 2016). However, very little is known about the health impact on fathers when they are caring for or living with a disabled child, compared to fathers of non-disabled children. To the best of our knowledge, there are no prior studies on this topic using a nationally representative Japanese population. This study aims to examine the association of a child's disability status with psychological distress and subjective health outcomes among fathers.

2. Material and methods

2.1. Data

Data for this study were obtained from the Comprehensive Survey of the Living Conditions (CSLC) conducted by the Ministry of Health, Labour and Welfare in 2016 (Ministry of Health Labour and Welfare of Japan, 2017). This household survey has been conducted every three years since 1986 using a multi-stage stratified random sampling method based on the census. Small scale surveys are carried out annually in the interim years to collect data on household and income. The large-scale survey consists of four self-administered questionnaire forms assessing the respondent's household composition, health status, income, and savings. Household and health questionnaire forms were distributed to nearly 290,000 households and responses were obtained from 224,641 households (77.6%). The respondents were household members who had been living in the household for more than three months and were not living in a medical facility. For the present study, we obtained permission from the Ministry of Health, Labour and Welfare of Japan (Approval no. 2021-0302-3) to use data from a large-scale survey in 2016. Ethical approval was also obtained from the ethical committee at the National Centre for Child Health and Development (No. 2020-299).

2.2. Study sample extraction

The study targeted those respondents identified as fathers of children aged 6–17 years at the observation point. Fig. 1 indicates how samples were extracted for our quantitative analysis. First, we extracted 89,543 children aged below 18 years from the entire CSLC dataset ($n = 568{,}426$). We then included children aged 6–17 years, as the assistance-related question was asked of those aged 6 years or above ($n = 63{,}604$). We selected the youngest child from each household when there were multiple children without disability in the family. In the case of a non-disabled twin child, we selected only one of the children with a higher household membership number in the survey data and excluded ($n = 623$) the other. In households where one child had a disability and others did not, the child with a disability was selected, and the other children were excluded ($n = 190$). In the house with multiple children with a disability, children were prioritised based on the most severe disability, longer duration or child who was youngest respectively, and we excluded ($n = 25$) non-corresponding children. In the case of a twin with the same severity and duration of disability, we chose the twin with a higher household membership number and excluded the other ($n = 7$). The severity of the disability level 1, 2, 3, 4 where level 4 corresponds to the most severe disability was based on the questionnaire in the CSLC survey.

Level 1	The child has the mildest level of disability but is independent in daily life and can go out by oneself
Level 2	The child is almost independent at home but needs assistance to go out
Level 3	The child needs assistance in activities of daily life and mainly stays in bed, but can maintain a sitting position
Level 4	The child is bedridden and requires assistance with all activities of daily life, such as egestion, meals, and changing clothes

We prioritised one child from each household as shown in Table A1 (supplementary).

We included a total of 40,446 children. Disabled children who received assistance for less than three months were excluded to avoid including children who suffered from acute injury or disability ($n = 75$). We then divided the data into 660 children with a disability and 39,711 children without a disability. Then, we merged child data with father data using the parent-child identifier variable. We excluded observations of children who were not living in a household with fathers ($n = 124$ (disabled), $n = 5490$ (non-disabled)). After excluding 6637

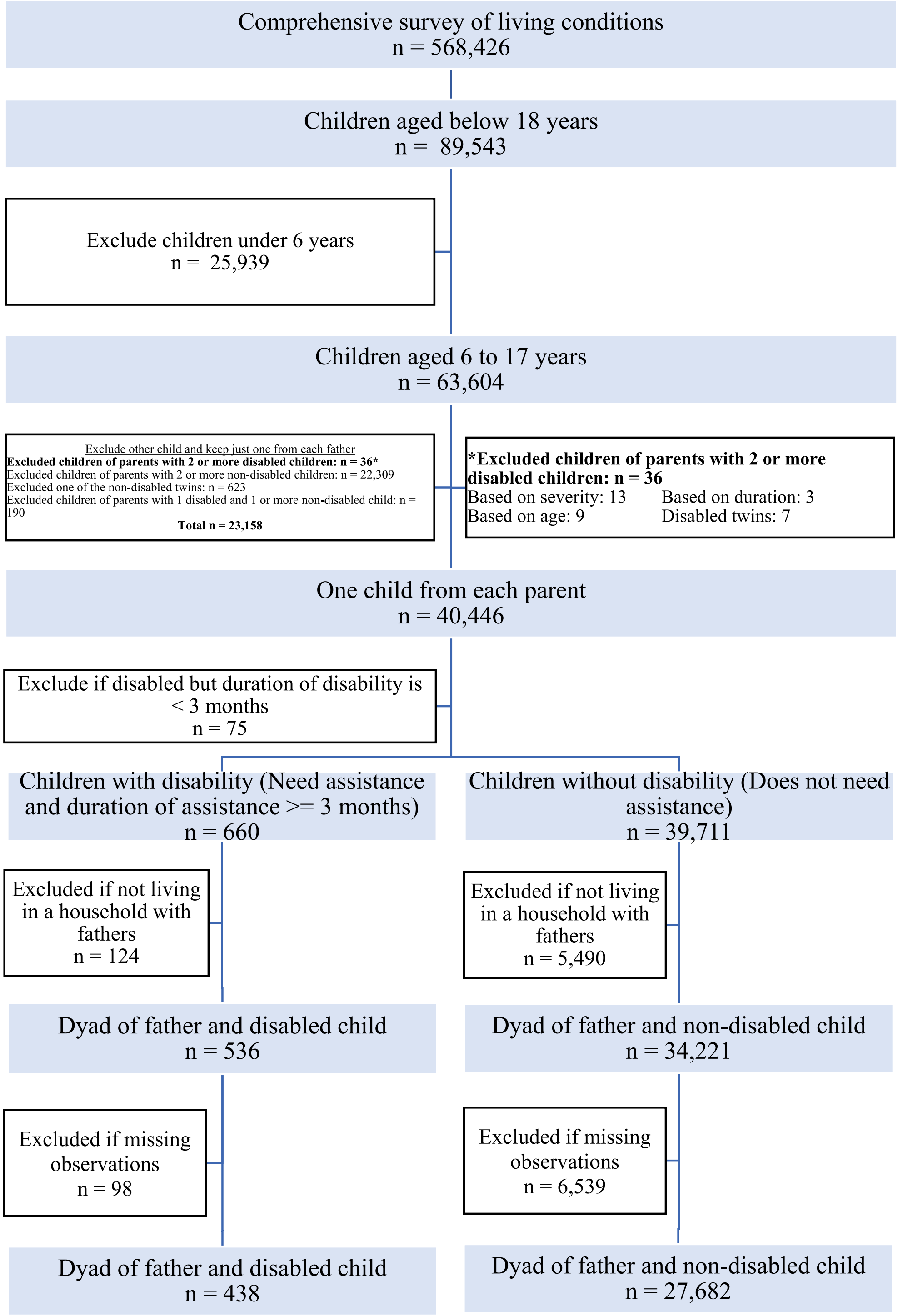

Fig. 1. Flow chart for selecting study samples.

respondents with missing observations, we finally included 438 disabled-child and father dyads and 27,682 non-disabled-child and father dyads in our study population.

2.3. Measured variables

2.3.1. Outcomes

The outcomes of interest in this study were paternal psychological distress and subjective health outcomes. Subjective health status assessed in the survey was categorised as good or average (good, not bad, average) and poor (not very good, bad). Psychological distress was measured using the Japanese version of the Kessler (K6) scale (Furukawa et al., 2008) that asks about six frequently experienced symptoms of psychological distress. This five-point Likert scale has a total score ranging from 0 to 24, where the participants respond to each statement rating on a scale of 0 (none of the time) to 4 (all the time). We found Cronbach's alpha for the reliability of K6 to be 0.93 using this dataset. The effectiveness of the Japanese version of K6 examined using areas under curve and stratum specific likelihood ratios (SSLR) demonstrated a likelihood ratio of greater than ten for a total K6 score of nine or more (Furukawa et al., 2008). As a SSLR of 10 or more is considered highly effective in mental health screening, we used a cut-off of 9–24 to indicate psychological distress (Furukawa et al., 2003; Ministry of Health Labour and Welfare of Japan, 2017; Schmitz et al., 2000; Takehara et al., 2020).

2.3.2. *Explanatory variables*

The disability status of the child was the explanatory variable. The assistance related question– ‘Does s/he need assistance?’–was asked to children aged six years or above for avoiding general parenting assistance of toddlers and pre-schoolers. In this study, children aged 6–17 years requiring assistance for more than 3 months at the time of the survey were categorised as disabled, while those not requiring assistance was categorised as a non-disabled child.

2.3.3. *Covariates*

The characteristics of the father (education, working hours per week), child (age, sex), and household (single father household, home type, monthly household expenditure per person) were used as covariates in the study. Detailed explanation and categorisation of the covariates can be found in the supplementary file.

2.4. *Statistical analysis*

We explored the distribution of variables by disability status using student t-test for continuous variables and chi-square test for categorical variables. We then used bivariate and multivariable logistic regression analysis with listwise deletion separately for outcome variables psychological distress and subjective health status. K6 score of nine or more was coded as ‘1’ representing psychological distress or ‘0’ otherwise. Subjective health status was coded as ‘1’ for poor and as ‘0’ for good or average. Multivariable logistic regression was used to analyse the association between a child’s disability status with each of the health outcomes of fathers after adjusting for covariates. Stata/MP version 14.2 (StataCorp LP, College Station, TX, USA) was used to conduct the analyses.

3. Result

Table 1 shows the distribution of variables separately by child’s disability status. Fathers of disabled children had a higher prevalence of psychological distress (17%) and poor subjective health status (13%) compared to fathers of non-disabled children. The mean age of fathers was around 44 years, and the mean age of children was around 11 years. Compared to girls (30%), a large proportion of disabled children were boys (70%). The majority of the disabled children had the mildest level of disability (47%) and were disabled for more than 5 years (83%). A fewer proportion of fathers of disabled children lived in their own home (77%) compared to fathers of non-disabled children (81%).

Table 2 shows the result of bivariate and multivariable regression analyses. After adjusting for covariates, the odds ratio (OR) of developing psychological distress (OR, 1.53; 95% confidence interval [CI], 1.19–1.97) and poor subjective health status (OR, 1.78; 95% CI, 1.34–2.36) among fathers of disabled children is significantly higher compared to fathers of non-disabled children. Compared to fathers working 40–55 h a week, unemployed fathers (OR, 3.07; 95% CI, 2.49–3.79), fathers working ≤39 h a week (OR, 1.26; 95% CI, 1.09–1.45) and fathers working ≥56 h a week (OR, 1.32; 95% CI, 1.21–1.44) had significantly higher odds ratio for developing psychological distress. Similarly, the adjusted odds ratio of poor subjective health status was significantly higher among unemployed fathers (OR, 4.90; 95% of CI, 3.95–6.09), fathers working ≤39 h a week (OR, 1.42; 95% CI, 1.21–1.67) and fathers working ≥56 h a week (OR, 1.33; 95% CI, 1.21–1.48) compared to fathers working 40–55 h a week. Tables A2 and A3 in the supplementary file show that fathers of children with disability levels 2, 3 or 4 had a lower odds ratio of psychological distress and poor subjective health status compared to fathers of children with the lowest severity (level 1) of disability.

Table 1
Distribution of variables by the child’s disability status.

Variables	Not-disabled (N = 27,682)		Disabled (N = 438)		p-value[b]
	n	%	n	%	
FATHER					
Age (mean (SD[a]))	44.2 (6.7)	NA	44.2 (6.6)	NA	0.492
Age category					
18–34 years	1890	6.8	26	5.9	0.681
35–44 years	12842	46.4	210	47.9	
45 years and above	12950	46.8	202	46.1	
Education attainment					
Higher	12925	46.7	199	45.4	0.601
Lower	14757	53.3	239	54.6	
Working hours per week					
≤39 h	1843	6.7	45	10.3	<0.05
40–55 h	18931	68.4	282	64.4	
≥56 h	6457	23.3	106	24.2	
Unemployed	451	1.6	5	1.1	
Subjective health status					
Poor	2134	7.7	57	13.0	<0.001
Good or average	25548	92.3	381	87.0	
Psychological distress (8/9)					
Absent	24402	88.2	363	82.9	<0.001
Present	3280	11.8	75	17.1	
CHILD					
Age (mean (SD[a]))	10.7 (3.5)	NA	11.2 (3.4)	NA	<0.001
Age category					
6–11 years	16323	59.0	239	54.6	0.063
12–17 years	11359	41.0	199	45.4	
Sex					
Male	13990	50.5	308	70.3	<0.001
Female	13692	49.5	130	29.7	
Disability level					
Not disabled	27682	100.0	0	0.0	NA
Level 1	0	0.0	206	47.0	
Level 2	0	0.0	182	41.6	
Level 3	0	0.0	19	4.3	
Level 4	0	0.0	29	6.6	
Unknown	0	0.0	2	0.5	
Period of dependence					
Not disabled	27682	100.0	0	0.0	NA
3 months to <5 years	0	0.0	74	16.9	
5 years or more	0	0.0	364	83.1	
HOUSEHOLD					
Total no. of disabled children					
0	27682	100.0	0	0.0	NA
1	0	0.0	422	96.3	
2 or more	0	0.0	16	3.7	
Household expenditure per person per month					
Below 25th percentile	6763	24.4	122	27.9	0.098
25th percentile and above	20919	75.6	316	72.1	
Single father household					
No	27052	97.7	433	98.9	0.113
Yes	630	2.3	5	1.1	
Type of home					
Own home	22533	81.4	339	77.4	<0.05
Rented or other	5149	18.6	99	22.6	

[a] Standard Deviation.
[b] Calculated using student t-test or chi-square test.

4. Discussion

The majority of the disabled children in the present study were boys (70%) and had lowest severity (level 1) of disability (47%). This study found that the prevalence of psychological distress (17%) among fathers of disabled children aged 6–17 years is higher than among fathers (11%) of children below 1 year of age (Takehara et al., 2020) as well as the overall prevalence of psychological distress (10.5%) in the Japanese population in 2016 (Ministry of Health Labour and Welfare of Japan,

Table 2
Association of child's disability status on the father's health outcomes.

Variables	Psychological Distress (8/9) (Yes)				Subjective health status (Poor)			
	Crude		Adjusted		Crude		Adjusted	
	OR[a]	95% CI[b]	OR[a]	95% CI[b]	OR[a]	95% CI[b]	OR[a]	95% CI[b]
Disability								
Not disabled		Reference		Reference		Reference		Reference
Disabled	1.54	(1.20–1.98) *	1.53	(1.19–1.97) *	1.79	(1.35–2.37) *	1.78	(1.34–2.36) *
Child's age								
6–11 years		Reference		Reference		Reference		Reference
12–17 years	0.96	(0.89–1.03)	0.94	(0.87–1.01)	1.27	(1.17–1.39) *	1.24	(1.13–1.35) *
Child's sex								
Male	1.04	(0.97–1.12)	1.04	(0.96–1.11)	1.02	(0.93–1.11)	1.02	(0.93–1.11)
Single father household								
Yes	1.48	(1.19–1.83) *	1.43	(1.16–1.79) *	1.22	(0.93–1.60)	1.05	(0.80–1.39)
Education								
Higher	0.91	(0.84–0.98) *	0.92	(0.85–0.99) *	0.89	(0.81–0.97) *	0.91	(0.84–1.00)
Working hour per week								
≤39 h	1.27	(1.11–1.47) *	1.26	(1.09–1.45) *	1.44	(1.22–1.70) *	1.42	(1.21–1.67) *
40–55 h		Reference		Reference		Reference		Reference
≥56 h	1.32	(1.22–1.44) *	1.32	(1.21–1.44) *	1.33	(1.20–1.47) *	1.33	(1.21–1.48) *
Unemployed	3.19	(2.59–3.94) *	3.07	(2.49–3.79) *	5.06	(4.08–6.26) *	4.90	(3.95–6.09) *
Home type								
Own home		Reference		Reference		Reference		Reference
Rented or other	1.24	(1.13–1.35) *	1.19	(1.09–1.31) *	1.11	(1.00–1.24)	1.08	(0.97–1.20)
Household expenditure per person per month								
25th percentile and above	1.05	(0.97–1.15)	1.08	(1.00–1.18)	1.11	(1.00–1.23) *	1.12	(1.01–1.25) *

[a] Odds ratio.
[b] Confidence interval; *Significant at 5% level of alpha.

2017). We found a significantly higher odds ratio of psychological distress and poor subjective health status among fathers of disabled compared to non-disabled children. These results are similar to a study from the UK, which finds a significant difference in general health among fathers of children with and without disabilities (Langley et al., 2020). A systematic review of 20 studies of Western countries examining the mental health of fathers of children with intellectual disabilities concluded that fathers of children with disabilities are more likely to exhibit poor mental health compared to fathers in the general population (Dunn et al., 2019). A study in Australia found 17% of the fathers of children with Autism Spectrum Disorder had elevated psychological distress (Seymour et al., 2017). Studies from Europe and Africa have shown a higher prevalence of poor self-perceived health (Hedov et al., 2000), decreased self-esteem (Beata, 2016), and psychological distress among fathers of children with disabilities (Dunn et al., 2019; Masulani-Mwale et al., 2018). These fathers are more likely to require support than fathers of non-disabled children as they are at risk of having a compromised quality of life. Healthcare workers should consider support for children with disabilities and their families taking into account these health issues of fathers.

When a child is diagnosed with a disability, parents experience many difficulties along with various emotional states such as embarrassment, shame, rejection, anxiety, and psychotic disorders (Beata, 2016; George H. S. Singer & Frank Floyd, 2006; Kandel & Merrick, 2007). They are likely to feel lonely and stressed in the absence of social activities and social circles. In addition to other stressors and demands, parents experience social burdens and isolation while raising a child with a disability (Divan et al., 2012). Increasing pressure and demands of raising a disabled child might affect their mood and make them stressed and worried. Compared to children without disability, the family of children with disability experience higher levels of stress, regardless of the type of disability (Dardas & Ahmad, 2014; Hsiao, 2018). Fathers of children with disabilities focus on the future impact and consequences of disability on the child's life in an attempt to adopt socially acceptable behaviours while mothers focus on the current problem (Lamb, 1997). Characteristics of the child, as well as the quality of relationship with the partner, has a strong influence on the psychological distress of fathers (Giallo et al., 2015; Kayfitz et al., 2010). Parents are more likely to have poor family functioning, dissatisfied marital relationship and risk of separation if they have a disabled child (Christodoulou et al., 2020). Quality of life of family members is affected by type (Mulroy et al., 2008) and severity of disability (Hu et al., 2012; Wang et al., 2004) of the child. Fathers of children with higher severity of disability (level 2, 3 or 4) or with longer duration of disability had a lower odds ratio of developing psychological distress. This finding is consistent with a study from Australia that reported fathers of children with long term disabilities did not experience a higher risk of psychological distress compared to fathers of non-disabled children (Seymour et al., 2017). In our study, compared to children with level 2, 3 or 4 disability, a larger proportion of children with the duration of disability less than 5 years had level 1 disability. The lower odds ratio of psychological distress among fathers of children with higher levels of disability could be a result of acceptance and coping with the situation over time (Kandel & Merrick, 2007).

Compared to 8% of the fathers of children without disability, 13% of the fathers of children with a disability experienced poor subjective health status. This higher prevalence of poor subjective health status is consistent with the finding of Seymour et al. (Seymour et al., 2017). A family raising a child with a disability experiences negative effects such as lack of sleep, stress and lack of parental free time (Christodoulou et al., 2020; Dardas & Ahmad, 2014; Kotzampopoulou, 2015). Poor subjective health status could be a result of masked depression in men hidden by externalising problems (Addis, 2008). Devoting more time caring for a disabled child while spending less time in personal health or social activities is common in parents of disabled children (Barnett & Boyce, 1995). Fathers prioritise the needs of family and children before their own (Nam et al., 2010), spending more time in employment and not caring for themselves or seeking support for physical and mental health issues until encouraged by their partners (Goldenberg, 2014; Ringbäck Weitoft et al., 2004). Unemployed fathers of disabled children are at higher risk of psychological distress and poor subjective health status. Studies have shown that unemployed men are at a higher risk of suicide (Wada & Gilmour, 2016). As unemployment leads to reduced family income, the increasing cost of raising a disabled child puts fathers under financial burden. On the other hand, long working hours also lead to the poor mental health of fathers. Various support in seeking and retaining employment with flexible working conditions, including formal support by peers and health professionals, should be provided to fathers. It is important to make sure that unemployment support and mental health support are sufficient and accessible to fathers of disabled children as they face difficulty meeting the demands of life; caring for and supporting the child when their health is poor.

4.1. Strengths and limitations

As per our knowledge, this is the first study to assess the association between a child's disability status and health outcomes among Japanese fathers using a nationally representative sample. Previous studies were limited to the postnatal period or were conducted using convenient sampling.

However, this study has several limitations that need to be considered. The survey questionnaire used to identify the presence or absence and severity of disability was based on the subjective response of the family and not on medical diagnosis. Confirmation of disability status using a certificate would have been more appropriate to evaluate the conditions of children. This study analysed data of children aged six years and above as the questions related to disability were asked accordingly. Research in the future should analyse the mental and physical health of fathers of young disabled children as well. A complete case analysis in the multiple regression analysis could have resulted in selection bias as we excluded 6637 respondents with missing observations. Additionally, we did not consider the maternal factors that could have influenced psychological distress among fathers. We excluded respondents if the duration of disability was less than three months to avoid including children with acute injuries. During this process, we might have excluded some children with chronic disability. The data on psychological distress and health status was based on self-report. Clinical diagnosis of father's mental health, as well as general health condition was not sought. Similarly, subjective health status was measured using a single item from the CSLC questionnaire asking about the respondent's current health condition. Therefore, it is unclear to which aspect of health–physical, mental, or other–were the participants responding. However, the result of a single subjective health question is used as an outcome worldwide and is known to be associated with an increase in mortality risk (DeSalvo et al., 2006; Nishi et al., 2012). People from urban areas and with a higher socioeconomic background are less likely to respond to surveys (United Nations, 2005) possibly leading to selective recruitment of families with disabled children in this survey. Additionally, this study had a low proportion of young as well as single fathers. Fathers from these backgrounds may be at particular risk of psychological distress and physical health issues given the additional risks associated with these groups and they need to be studied further. Some hard-to-reach populations may be underrepresented in national surveys not just due to sociodemographic and socioeconomic factors but also depending on survey mode and designs. National surveys in the future should implement mixed-mode surveys with explicit stratification acknowledging the fact that different people are easy to reach or willing to respond to different survey modes. Oversampling of vulnerable populations such as young and single parents should be considered to answer important scientific questions.

4.2. Conclusion

This study elucidates the important aspects of physical and mental health needs of fathers of children with disability in a Japanese representative sample. There is a need for continued research to support fathers including other family members in effective parenting, delivering support and quality care to their children. Family-centred care should be provided promoting each family member for their unique role in interacting with their children to help relieve the burden of fathers and improve the wellbeing of everyone involved. Fathers including other family members of children with disabilities need greater support for physical and mental health as well as subjective wellbeing. Public support should be expanded to help families of disabled children with childcare and housekeeping services, helping them spare time for themselves. As fathers are less likely to seek support (Nam et al., 2010), welfare services working for disabled children should reach out to their fathers providing necessary assistance in referring and linking them to family support services helping parents improve their skills and overcome obstacles to promote optimum child development, as well as to other fathers of children with disabilities. As fathers of disabled children learn to care independently for their children, shared family care and parenting services can be provided for helping them manage stress and improve their psychological health and physiological wellbeing.

Author contributions

Conceptualisation: BD, KaT, KeT; Data curation: BD; Formal Analysis: BD; Funding acquisition: KaT, KeT; Investigation: BD, KaT, KeT; Methodology: BD, KaT, MO, SG, YK, KeT; Project Administration: BD, KaT, KeT; Resources: BD, KaT, KeT; Supervision: KaT, MO, SG, YK, KeT; Validation: BD, KaT, MO, SG, YK, KeT; Writing – original draft: BD; Writing – review & editing: BD, KaT, MO, SG, YK, KeT, All authors have read and approved the final manuscript.

Ethical statement

Ethical approval was obtained from the ethical committee at the National Centre for Child Health and Development (No. 2020-299).

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Declaration of competing interest

None.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.ssmph.2021.100951.

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