



# The Actor–Partner Effects of Parenting Stress on Quality of Life Among Parents of Children with ASD: The Mediating Role of Mental Quality of Life

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## Abstract

The present study investigated the actor–partner effects of parenting stress (PS) on quality of life (QoL) among parents (96 couples) of children with autism spectrum disorder (ASD). Data were collected using the QoL Scale and the PS Index. Structural equation modeling was also utilized to test the hypothesis. The results revealed the effects of PS in each parent on mental QoL of that parent. Maternal PS further shaped physical QoL in mothers. However, PS in one parent did not influence QoL of his or her partner. Accordingly, mental QoL had a mediating role between PS and physical QoL. It was ultimately suggested to take account of QoL among parents in addition to the treatment of children with ASD.

**Keywords** Autism · Mental quality of life · Parental stress · Physical quality of life

## Introduction

Cognitive disorders, behavioral problems, mood affective disorders, lower levels of adaptive functioning, self-neglect, language impairments, learning disabilities, and the need for lifetime care not only influence children with autism spectrum disorder (ASD) but also have impacts on their caregivers, families, teachers, and society (Aali et al. 2015). Studies in this line have established that parents of children with ASD may encounter many problems associated with caring for these children (Calzada et al. 2012). Such problems can cause tremendous stress in parents, which would consequently worsen their children’s behavioral problems (Cruz et al. 2013).

Parenting stress (PS) refers to the direct effect of interaction between the most obvious characteristics of parents

(such as depression, sense of competence, health status, relationships plus attachments with children, marital relationships, and limitations induced by assuming roles or motherhood) and those of children (e.g. compatibility, compliance, ambition, mood, hyperactivity, and corroboration) (Cooper et al. 2009). The stress of having a child with ASD may also have negative impacts on quality of life (QoL) in parents. With reference to the definition provided by the World Health Organization (WHO), QoL refers to individuals’ perceptions of their positions in life in terms of culture, systems of values they are living in, goals, expectations, existing standards, and priorities. It is quite subjective and cannot be viewed by others. It is also based on individuals’ understanding of different aspects of life (Ghaffary et al. 2012). Although several studies have to date addressed the relationship between PS and QoL among parents of children with ASD, few cases have reflected on both parents of such children, to the best of authors’ knowledge. In this respect, Dardas and Ahmad (2014a) merely reported that some levels of PS could be associated with parental QoL. Similarly, a study on both parents established that caregivers’ stress was inversely correlated with their QoL (Johnson et al. 2011).

The family systems theory (FST) correspondingly suggests that family is a system and individuals are dependent, constituting a complex system with one entity, so that parenting by each parent is not only influenced by feelings, manifestations, and perceptions of them, but also shaped

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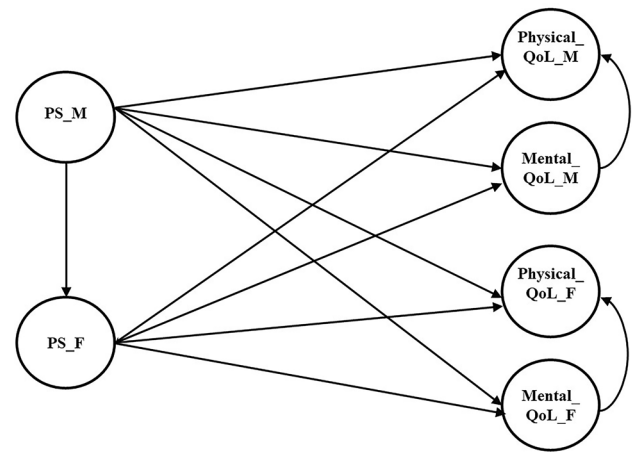
by those of their partners (Kerr, 1981). Accordingly, the actor–partner interdependence model (APIM) considers parents as a unit of analysis. Thus, the effect of an independent variable on the dependent one in the same individual is taken into account, namely, the actor effect, and the same impact is further examined on their partners. In fact, the influence of couples on each other is called the partner effect. In spite of this theory, fathers have often been ignored in studies on parenting (Ponnet, 2013).

Most investigations have simply reflected on an individual as a unit of analysis; in other words, they have examined the actor effect (Dardas & Ahmad, 2014a, 2014b, 2015; Marsack-Topolewski & Church, 2019; Rivard et al. 2014; Malhotra et al. 2012). Further studies have only focused on mothers as half part of the picture (Johnson & Simpson, 2013; McStay et al. 2014; Miranda et al. 2019; Salehi et al. 2017). Surveys related to parental QoL have merely put emphasis on overall QoL (Marsack-Topolewski & Church, 2019; Özgür et al. 2018) and it has not been researched whether or not PS shapes both physical and mental QoL and if the impact of the physical domain is direct or indirect. In the present study, the main assumption is that stress itself is a psychological construct that may affect mental QoL, playing a mediating role in forming physical QoL. According to a study, mental health status had a mediating role between physical illnesses and individuals' perceptions of well-being (Lorem et al. 2017). Besides, Galletta et al. (2019) reported a relationship between mental and physical QoL and the mediating role of mental QoL in the relationship between a psychological construct, i.e., a sense of coherence with physical QoL.

Exploring the extent of the impact of having children with ASD, considering both parents, and evaluating the effects of problems facing one parent on his or her partner can be thus valuable for designing family-based interventions for those having children with ASD. The present study aimed to investigate the actor–partner effects of PS on QoL among parents having children with ASD and to evaluate the mediating role of mental QoL in the relationship between PS and physical QoL. The conceptual model of the study is illustrated in Fig. 1.

## Research Method

This cross-sectional correlational study was carried out in 2019. The study population included parents of children with ASD in all tertiary and rehabilitation centers in Bush-ejr and Shiraz (two capital cities in southern Iran).



**Fig. 1** The conceptual model of the study. *PS\_M* mother parental stress, *PS\_F* father parental stress, *Mental QoL\_M* mental quality life of mother, *Physical QoL\_M* physical quality life of mother, *Mental QoL\_F* mental quality life of father, *Physical QoL\_F* physical quality life of father

## Participants

The study samples comprised 96 couples ( $n = 192$  individuals) having children with ASD. The inclusion criteria were parents having children aged 3–18 years with ASD, biological parents of children, and awareness of ASD development in their children. The exclusion criteria contained the presence of psychiatric disorders or seriously debilitating physical illnesses in parents, use of psychoactive drugs, and having other mentally retarded children or ones with severe medical conditions.

## Measures

In this study, data collection tools consisted of a demographic characteristics information form (including items on age, gender, level of income, number of children, etc.), the 36-item World Health Organization Quality of Life Scale, and the PS Index (PSI).

The PSI contained three sub-scales of parental distress (PD), parent–child dysfunction interaction (PCDI), and difficult child (DC), wherein each one could be measured using 12 items (Abidin & Brunner, 1995) based on a five-point Likert-type scale. The reliability and validity of the Persian version of this questionnaire were previously calculated by Shirzadi et al. The reliability of this research instrument was further verified with a Cronbach's alpha coefficient of 0.59–0.86 and the test–retest reliability coefficient, considering a 16-day interval, was between 0.92 and 0.97 (2015).

QoL was further measured using the 36-item medical outcomes study short form health survey (SF-36)

(Framework, 1992). This questionnaire had eight scales constituting two general components, i.e., mental QoL including role emotional (RE, 3 items), vitality (VT, 4 items), mental health (MH, 5 items), and social functioning (SF, 2 items), and physical QoL consisting of physical functioning (PF, 10 items), role physical (RP, 4 items), general health (GH, 5 items), and bodily pain (BP, 2 items). Ultimately, one item has been added to measure variations in GH in individuals over recent years. The responses in the questionnaire were also based on a Likert-type scale with different spectra. Scores for each scale could also be converted into percentages through a linear transformation; in other words, each scale and overall QoL could have a score between 0 and 100. Translation, cultural adaptation, and validation of the Persian version of this questionnaire were previously done by Montazeri et al. (2005). In the present study, both physical and mental QoL as general components were used in the form of latent dependent variables. Of note, it must be chosen whether the variable indicators are reflexive or formative once a tool is employed for measuring a latent variable (Podsakoff et al. 2006). Moreover, both QoL components, i.e. physical and mental ones, were utilized as latent variables and the sub-scales constituting each component were considered as formative indicators. Three sub-scales of PD, PCDI, and DC were regarded as formative indicators of parental stress.

### Materials, Procedures, and Ethical Consideration

The research project was approved with the code of ethics (IR.BPUMS.REC.1398.017) from the Ethics Committee of Bushehr University of Medical Sciences. For sampling, the researchers met the parents in the consulting room of tertiary and rehabilitation centers, introduced themselves to those who met the inclusion criteria, and then explained the objectives of the study. Acquiring their consent and putting emphasis on confidentiality of data and anonymity, the participants finally completed the questionnaires. The study was performed in accordance with the ethical standards as laid down in the 1964 Declaration of Helsinki and its later amendments or comparable ethical standards.

### Data Analysis

Collected data were analyzed using the SPSS software (v.19) and the smart partial least squares (PLS)-Graph 3.00 software. Correlations between the primary variables were analyzed through Pearson's correlation coefficient. Due to the small sample size, path analysis was carried out through the PLS-Graph 3.00 software as a robust method (Henseler

et al. 2009). The t-statistic and confidence interval (CI) were obtained by bootstrapping with 5000-iteration resampling. The initial conceptual framework was modified and the statistical model was tested according to the correlation results. The sub-scales of the variables were further utilized as formative indicators of the latent variables (namely, the variables were imported into the model in a formative manner). Given the formative nature of the constructs, the weight and t-statistic were used for external fit of the model, and  $Q^2$  and  $R^2$ -statistic were provided for its internal model fit.

### Results

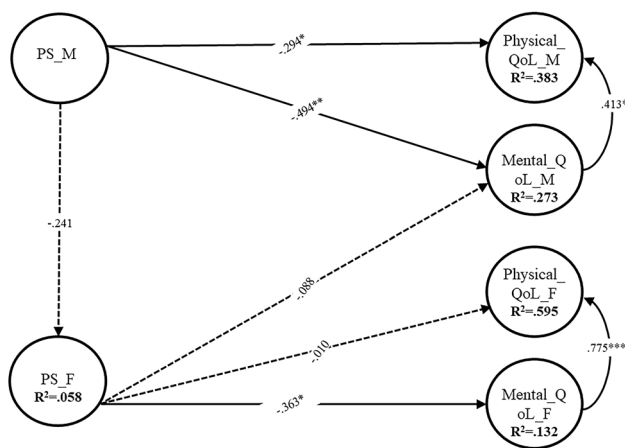
The mean ages of the mothers and the fathers recruited in this study were respectively  $48.48 \pm 8.41$  and  $53.31 \pm 7.90$  years, with a significant difference based on a paired t test ( $t = 8.664$ ,  $P < 0.001$ ). Within our sample, 20% of the mothers and 15% of the fathers had primary education, 44% of the mothers and 45% of the fathers had secondary education or diploma and 36% of the mothers and 40% of the fathers had university education. The educational levels of fathers were not significantly different from those of mothers ( $X^2 = 0.361$ ,  $P = 0.327$ ). Most of the mothers (86%) and the fathers (92%) were housewives and employed, respectively. Most of the families had a moderate level of economic status (66%), and the mean age of their children was  $10.4 \pm 3.22$  years with 72% boys and 28% girls. Fifty percent of children had three or higher birth order. Severe and moderate autism were observed in 90 and 10% of the children, respectively. Mean levels of parental stress in mothers ( $Z = -1.086$ ,  $P = 0.277$ ) and fathers ( $Z = -1.153$ ,  $P = 0.249$ ) were not statistically different between children with moderate and severe autism. There was a statistically inverse correlation between PS in each parent and physical and mental QoL of that parent. However, only fathers' PS had a statistically inverse correlation with maternal mental QoL (Table 1). For this reason, the statistical model tested (Fig. 2, the external model is not illustrated) was different from the presented conceptual one, with reference to the obtained correlations. Weight and t-statistic for formative constructs, six variables of PS in fathers and mothers, and physical and mental QoL in fathers and mothers (fitness indices of the external model) are listed in Table 2, wherein the weights are statistically significant. Additionally, the variance inflation factor (VIF) value indicated the absence of multicollinearity in the sub-scales constituting each main variable. In connection with the results of the internal model, the direct effect of mothers' PS on their own physical and mental QoL was statistically significant. Besides, fathers' PS had a direct effect on their own mental QoL, which was statistically significant, but such an influence was not significant on physical QoL. The indirect effect of PS in each

**Table 1** Correlations among the variables

	1	2	3	4	5	6	7
Physical_QoL_F	1						
Mental_QoL_F	0.619**	1					
Physical_QoL_M	0.073	0.117	1				
Mental_QoL_M	0.189	0.197	0.286**	1			
PS_M	-0.034	-0.047	-0.397**	-0.446**	1		
PS_F	-0.220*	-0.247*	-0.196	-0.229*	0.291**	1	
Mother age	-0.024	0.020	0.071	-0.029	0.075	0.036	1
Father age	0.038	-0.025	0.082	0.063	-0.027	0.059	0.804**

PS\_M mother parental stress, PS\_F father parental stress, Mental QoL\_M mental quality of life of mother, Physical QoL\_M physical quality of life of mother, Mental QoL\_F mental quality of life of father, Physical QoL\_F physical quality of life of father

\*\*p < 0.01, \*p < 0.05



**Fig. 2** Path analysis testing for direct and indirect effects showing associations between parental stress (mother and father) with physical and mental quality of life. Black arrows indicate significant effects and dashed line are nonsignificant effects. PS\_M mother parental stress, PS\_F father parental stress, Mental QoL\_M mental quality life of mother, Physical QoL\_M physical quality life of mother, Mental QoL\_F mental quality life of father, Physical QoL\_F physical quality life of father

parent on physical QoL of the same parent was also statistically significant based on the mediating role of mental QoL. Furthermore, the impacts of fathers' PS on maternal mental QoL and mothers' PS on fathers' PS were not statistically significant (Table 3). In addition, no multicollinearity was observed between the internal independent variables (viz. the minimum and maximum VIFs for the internal model variables were respectively 1 and 2.28). The fitness of the internal model was also measured using Q<sup>2</sup>-statistic, whose values for PS and for fathers' mental QoL were at minimum (0.090) and maximum (0.390) levels, respectively, which were at an acceptable level.

## Discussion

This study was to investigate the actor-partner effects of PS on QoL among parents having children with ASD and to evaluate the mediating role of mental QoL in the relationship between PS and physical QoL. Based on the study results, maternal PS could directly affect their own physical and mental QoL. In addition, fathers' PS could have a direct effect on their own mental QoL, but its impact on physical QoL could be due the mediating role of mental QoL. The effects of maternal PS on fathers' PS and vice versa were not established here. Generally, the actor effect was approved but not for the partner effect. Additionally, our results confirmed the mediating role of mental QoL in the relationship between PS and mental and physical QoL in fathers and mothers.

Furthermore, PS could affect only the parent and had no effects on partners, that is, our findings confirmed the actor effect but not the partner one. The results correspondingly revealed that maternal PS could directly influence the mental and physical QoL, even though the impact of the former was stronger. In fathers, only mental QoL was directly under the influence of PS. In most studies, the actor effect was examined but the partner one was less considered, indicating the relationship between PS and QoL (Hsiao, 2016, 2018; Samadi & McConkey, 2014). Dardas and Ahmad (2014a, 2014b) and Bashirian et al. (2019) further demonstrated that the effect of PS on mothers was stronger than that of PS on fathers' QoL (Bashirian et al. 2019; Dardas and Ahmad 2014a), which are consistent with results of the present study. A systematic review also found that decline in well-being was correlated with higher levels of anxiety and depression in parents of children with ASD (Al-Oran and AL-Sagarat 2016). Similarly, the sub-scale of PD, i.e., caring stress, was reported to be related to low physical QoL in mothers, but not with their mental QoL (Johnson & Simpson, 2013). In this study, fathers' personal stress was



**Table 2** The measurement model: weight, VIF, and t value for the formative construct (outer model)

	VIF	Weight	t value
<b>PS_M</b>			
PD	1.601	0.45	2.889**
PDCI	1.723	0.644	2.793**
DC	1.566	0.193	4.605***
<b>PS_F</b>			
PD	1.352	0.467	4.699***
PDCI	1.344	0.684	4.610***
DC	1.459	0.193	4.605***
<b>Mental QoL_M</b>			
Emotional_role	1.04	0.416	2.998**
Vitality	1.614	0.467	2.975**
Mental_health	1.645	0.648	2.225*
Social_function	1.002	0.586	2.175*
<b>Physical QoL_M</b>			
Physical_function	1.109	0.103	2.098*
Physical_role	1.238	0.156	2.960**
Pain	1.149	0.299	2.084*
Public_health	1.219	0.193	3.210**
<b>Mental QoL_F</b>			
Emotional_role	1.11	0.343	5.979***
Vitality	1.624	0.644	2.397*
Mental_health	1.681	0.472	4.230***
Social_function	1.06	0.586	2.175*
<b>Physical QoL_F</b>			
Physical_function	1.29	0.024	3.036**
Physical_role	1.601	0.109	4.322***
Pain	1.099	0.28	2.259*
Public_health	1.089	0.27	2.013*

*PS\_M* mother parental stress, *PS\_F* father parental stress, *PD* parental distress, *PDCI* parent–child dysfunctional interaction, *DC* difficult child, *Mental QoL\_M* mental quality of life of mother, *Physical QoL\_M* physical quality of life of mother, *Mental QoL\_F* mental quality of life of father, *Physical QoL\_F* physical quality of life of father, *VIF* variance inflation factor

\*\*\* $p < 0.001$ , \*\* $p < 0.01$ , \* $p < 0.05$

merely associated with their mental QoL, and none of the stress sub-scales was correlated with fathers' physical QoL. This might be due to the use of different tools for measuring PS in this survey; hence, it could not be compared with the present study. This point, however, that stress could only influence fathers' mental QoL is similar to the findings of this study. On the other hand, the fact that mothers' care stress could only affect their own physical QoL is not in line with the present study. In the study by Johnson and Simpson, no effect of PS on mothers' mental QoL could be developed from a mediating variable, i.e. family support. Another point was that only care stress was considered in the mentioned study, that is, the type of stress that was mostly physical.

A systematic review further reported different results in studies related to QoL among parents having children with ASD (Vasilopoulou & Nisbet, 2016). The discrepancy in the effects of PS on two different components of QoL in parents suggests that determinants of QoL are different in fathers and mothers of children with ASD.

Although several changes have been until recently made in the definitions of gender-specific roles in Iran, beliefs and even public opinions within the society indicate that women are mainly responsible for family duties and fathers work outside the home (Taghizadeh, 2017). Mothers are thus regarded as the main caregivers of children with ASD and they are struggling most of the day with numerous challenges, which can have negative impacts on their own physical and mental QoL. Dominating culture in the society, beliefs and opinions among fathers and mothers, assignment of roles, available resources, and mechanisms practiced to cope with stress can accordingly change the effects of different variables on QoL. In a qualitative study on mothers of children with crippling conditions, these mothers believed that they could take care of their children and meet their needs better than anyone else, even their fathers (Ribeiro et al. 2016). Therefore, providing care for children with ASD and performing other house chores can put lots of pressure on mothers and affect their physical QoL. Nevertheless, fathers are typically not physically involved with childcare; they work outside the home, which is an opportunity to escape from stressors at home. Unquestionably, these results should not be ignored that PS can affect fathers' physical QoL, if not directly, through the mediating role of mental QoL. Based on the results of the present study, PS could influence mental QoL more than the physical one. In this study, having a child with disabilities could also make parents, especially mothers, involved in their physical care; likewise, they might be drawn against a series of other problems, diminishing their mental QoL, including problems such as the stigma of having a child with disabilities, problems in education, business, and finance (e.g. healthcare costs for these children), and other issues that affect their mental QoL more than the physical one.

In a qualitative study, parents of children with ASD reiterated that they hid their children from others due to public opinions. Others were also concerned about how their children could be viewed by others. Such parents encountered a number of problems within the society, were emotionally silent, and did not like to talk to anyone about their children (Ellen Selman, 2018). The influence of PS on mothers' mental QoL could be attributed to different views and strategies in each parent. Another study further established qualitatively that parents of children with ASD were suffering from stress and anxiety, but their views were poles apart. For example, some mothers supposed that talks with

**Table 3** Direct, indirect, and total effects

Path	Direct effects	t for direct effects	Indirect effects	t for indirect effects	Total effects	t for total effect
Mental QoL <sub>F</sub> →physical QoL <sub>F</sub>	0.775	10.091***			0.775	10.091**
Mental QoL <sub>M</sub> →physical QoL <sub>M</sub>	0.413	2.056*			0.413	2.056*
PS <sub>F</sub> →mental QoL <sub>F</sub>	−0.363	3.312*			−0.363	3.312**
PS <sub>F</sub> →mental QoL <sub>M</sub>	−0.088	0.959			−0.088	0.959
PS <sub>F</sub> →physical QoL <sub>F</sub>	0.01	0.107	−0.282	3.140**	−0.271	2.445*
PS <sub>M</sub> →mental QoL <sub>M</sub>	−0.494	4.912**	−0.021	0.68	−0.515	5.660***
PS <sub>M</sub> →PS <sub>F</sub>	0.241	1.886			0.241	1.886
PS <sub>M</sub> →physical QoL <sub>M</sub>	−0.294	2.105*	−0.213	1.980*	−0.507	4.291**
PS <sub>F</sub> →physical QoL <sub>M</sub>			−0.036	0.792	−0.036	0.792
PS <sub>M</sub> →mental QoL <sub>F</sub>			−0.088	1.481	−0.088	1.481
PS <sub>M</sub> →physical QoL <sub>F</sub>			−0.065	1.368	−0.065	1.368

*PS<sub>M</sub>* mother parental stress, *PS<sub>F</sub>* father parental stress, *Mental QoL<sub>M</sub>* mental quality of life of mother, *Physical QoL<sub>M</sub>* physical quality of life of mother, *Mental QoL<sub>F</sub>* mental quality of life of father, *Physical QoL<sub>F</sub>* physical quality of life of father

\*\*\* $p < 0.001$ , \*\* $p < 0.01$ , \* $p < 0.05$

the father of the child usually resulted in no outcomes, but fathers believed that there was a need to find the underlying cause of the problems over time not through talking about them (Samadi & McConkey, 2014). Differences in opinions and the methods of coping with problems could accordingly shift the impacts of the stress of having a child with ASD on mental QoL. Mothers of children with ASD might isolate them as a way of adapting to their unusual behaviors. Such mothers might also isolate themselves for not dealing with people who do not help or cause stress, and this was a risk factor (Johnson & Simpson, 2013). Further studies on different variables, internal and external sources of support, and their contribution to determining mental and physical QoL among parents can thus help in better understanding of the problems involved in their QoL and in optimal planning to enhance QoL of parents having children with ASD. Qualitative studies can also deeply investigate problems of such parents. Due to the effect of PS on QoL of both parents, it is generally essential to take comprehensive measures by families and family health practitioners to reduce stress in families caring for children with ASD.

The partner effect was not confirmed in the present study. Studies on the impact of a parent's PS on parents of children with ASD are not available to the best of authors' knowledge. In this line, Ponnet et al. merely explored the actor–partner effects of PS and symptoms of depression in parents of children without disabilities. In this study, PS of one parent had no effects on parent–child relationships with the other parent, i.e. the partner effect was not established therein. However, the partner effect was affirmed in terms of the impact of symptoms of depression on parent–child relationships. They further concluded that the presence or absence of a partner effect could be related to the type of the determinant variable (Ponnet et al. 2013).

Based on the FST, problems in one family member would generate difficulties for others, but this theory is not supported by the results of this study. It should be noted that the overflow from one person to another or from one parent to the other one in a family is a complex mechanism. With reference to the double ABC-X model of family adjustment and adaptation, the process of coping with stressful events was associated with four factors and their interactions. Such factors included stressors, internal and external sources, stressor evaluation (namely, whether or not the stressor was seen as a challenge and threat), and methods of coping with stressors. The interaction of these four factors could accordingly determine the consequences of the stressors (McCubbin & Patterson, 1983). Instead of stress overflow from one parent to another one or the effect of stress on QoL of another parent, individuals might keep the problems within themselves and try not to transfer stress to the other parent and consequently double them. In this respect, women in the Iranian culture believe that one of their important tasks is to keep their husbands calm and happy. Therefore, they may try not to pass on the stress of having a child with ASD to their husbands, and this affects each parent due to children's problems hence the resulting stress remain in the same parent and is not transferred to the other one.

In the present study, mental QoL in both fathers and the mothers acted as a mediator between PS and physical QoL. The direct or mediating effect of mental QoL on physical QoL was proven in previous studies (Galletta, 2019; Lorem et al. 2017). The mediating role of mental QoL in the relationship between PS and physical QoL can be thus explained with reference to the definition of QoL and the construct of the physical QoL. Generally, QoL is a psychological construct as perceptions of one's physical or mental

QoL. Therefore, individuals will not function properly in the society and feel low in general health when they are not mentally fit. These issues are measured in terms of physical QoL, which is also affected by a person's mental conditions.

This study was among the limited attempts examining the partner effect; however, there were several limitations. First, the relationships could not be interpreted causally due to the cross-sectional design of the study. Second, the sample size was relatively small, which could cause negative results due to its low power. In addition, some variables were not included in the analysis due to the small sample size in some level of variables or due to the large number of missing data, such as child support services and costs. Studies recruiting a larger sample size can thus lead to more detailed results. Third, since the sampling method in this study was of convenience type, the results should be generalized with caution. Finally, the situation of the children's school and educational levels were not considered in this study hence inclusion of this variable can provide more accurate results.

## Conclusion

The present study revealed that PS in each parent could affect the QoL of that parent, but not that of his or her partner. The results also demonstrated the mediating role of mental QoL between PS and physical QoL. Given that both components of QoL in parents having children with ASD could be negatively affected by PS, providing conditions to reduce stress in these parents is of utmost importance. Health care providers must thus consider family as a whole and cooperate with other counterparts for developing interventions. Policy-making to moderate costs imposed on parents of children with ASD, creating child care centers that offer full-day, part-day, and hourly care for such children to decrease the burden of maternal care, and teaching mechanisms and methods of coping with stress to such parents can help mitigate PS and improve their QoL.

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**Authors Contribution** HV, FJ and RB contributed substantially to the conception and designed of the study. SK contributed to the data collection. RB analyzed the data. HV and SK wrote the manuscript. RB prepared final version of manuscript. All authors provided critical feedback and helped shape the research.

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## Compliance with Ethical Standards

**Conflict of interest** The authors declare that they have no conflict of interest.

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