



Quality of Life Among Malaysian Parents with Autism Spectrum Disorder Child: The Double ABCX Model Approach

Mohd Fahmi Ismail¹ · Razitasham Safi¹ · Rosalia Saimon¹ · Md. Mizanur Rahman¹

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Abstract

This paper reported the quality of life (QoL) of 260 Malaysian parents with autism spectrum disorder (ASD) and factors which influencing it. About half of these parents reported to having good QoL. The factors identified in the double ABCX model showed that perceived social support and sense of coherence (SOC) were mediated by coping strategies and had a positive direct and indirect effect on parents' QoL. These finding reiterate the importance of social support, coping skills, and strong SOC reflection skills in influencing the QoL of parents with ASD child. We therefore suggest parents to utilize the widely available social and organization supports to gain good QoL, which is also important for the wellbeing of their child.

Keywords Autism spectrum disorder · QoL · ABCX model · Parents

Introduction

Autistic children may suffer from various functional challenges due to their low social interaction abilities, impaired verbal or non-verbal communication, and stereotypical behaviours (Kuhlthau et al., 2014). Due to the complexity of autism spectrum disorder (ASD), autistic children demand full-time attention. As parents, raising an autistic child requires a considerable amount of time, physical energy, emotional strength, and financial support (Obeid et al., 2015; van Tongerloo et al., 2015). Some parents have a hard time coping with the lifelong burden to care for the autistic child (Khanna et al., 2011). It can be challenging and burdening to fulfil the needs of an autistic child. Parents need to ensure that other family members are also being taken care. Often,

parents sacrifice their own needs to put their children needs first. As a consequent, parents experience high levels of concern and insecurity regarding the future of their autistic child from the moment of the diagnosis.

To date, there is no established cure for ASD. Early rehabilitation could reduce the autism severity (Ramey, 2019). Adequate social support for the parents has been found to be one of the protective factors towards reducing the severity of the autistic condition (Dyches et al., 2012; Kawabata et al., 2011). There is evidence that shows social support reduces parental pressure (Tichovolsky et al., 2013) and promote a high level of satisfaction among them (Cetinbakis et al., 2020). Faced with the hardship of raising an autistic child, parents need to look at their situation and redefine their sense of coherence and parenting roles. For instance, they need to improve their ability to control emotion, utilise resources, prioritise efforts to establish the new norm in their life for the benefit of the child.

Parents with ASD children will eventually go through a family adaptation phase, which is a transition period that occurs during family restructuring processes as a result of stressors and other burdens in life (McCubbin & Patterson, 1983). During this phase, it is vital for parents to apply appropriate coping strategies and acquiring help in order to deal with an autistic child (Paster et al., 2009).

As shown in the literature, the double ABCX model is commonly used to outline the various factors affecting family adaptation process undertaken by parents with an ASD

✉ Mohd Fahmi Ismail
chekbronze7@gmail.com

Razitasham Safi
razitasham@gmail.com

Rosalia Saimon
srosalia@unimas.my

Md. Mizanur Rahman
rmmizanur@unimas.my

¹ Department of Community Medicine and Public Health, Faculty of Medicine and Health Sciences, Universiti Malaysia Sarawak (UNIMAS), 94300 Kota Samarahan, Sarawak, Malaysia

child (Manning et al., 2011; McStay et al., 2015; Paynter et al., 2013; Pozo et al., 2014). The evidence shows that parental adaptation (xX) towards raising a special child in the family over time depends on the interrelation of four factors, namely pile-up demands and additional life stressors (aA), family adaptive resources (bB), family appraisal of the situation (cC), and family adaptive coping (BC) Fig. 1.

Figure 1 shows that family adaptation (Xx factor) is the outcome of the four proposed factors affecting family adaptation. In this study, quality of life (QoL) among parents of children with ASD was chosen as the outcome factor of family adaptation similar to study done by Bohadana et al., (2019). QoL is described by World Health Organization (WHO) as “an individual’s perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards, and concerns” (The Whoqol Group, 1998; World Health Organization, 1996). Evidence showed various factors influencing the QoL of parents with ASD children such as autism child characteristic, social support, perception of parents, and parental coping strategies (Ji et al., 2014; McStay et al., 2015; Pozo et al., 2014; Predescu & Sipos, 2017). The family adaptation that takes place in the process of raising an autistic child has been extensively studied, but parent’s QoL as the outcome of family adaptation is still understudied (Bohadana et al., 2019; Pozo et al., 2014).

It is important to obtain an accurate measurement of the parents’ QoL because they are the closest family members who are most impacted by the presence of autistic children. Therefore, the present study is aimed to measure the parents’ QoL as the family adaptation outcome. Secondly, this paper aimed to identify factors in the double ABCX model, which were postulated to influence the QoL of parents with ASD child.

Factors derived from the double ABCX model include the perceived autism child characteristics (aA factor), perceived social support (bB factor), sense of coherence (cC factor),

and parental coping strategies (BC factor) with the QoL of parents of children with ASD as the family adaptation outcomes (xX factor). Specifically, this study hypothesized there are association between the perceived autistic child characteristics, perceived social support, sense of coherence, parental coping strategies and the QoL of the parents with ASD children. We further hypothesized the role of coping strategies to dominate the relationship between perceived child characteristics, perceived social support, sense of coherence and parents’ QoL Fig. 2

Method

Design and Participants

A cross-sectional study was conducted among 260 parents with ASD children (less than 18 years old) in the state of Sarawak, Malaysia. Parents were recruited from private and public autism rehabilitation institutions in Sarawak. The enrollment of parents was done using a purposive sampling method. The exclusion criteria for the current study were those parents diagnosed with mental illness either on treatment or not. By using G-Power 3.1 software (Faul et al., 2007), the minimum number required for this study was 250.

Data Collection Instruments and Procedure

This study used five difference instruments to measure perceived child characteristics, perceived social support, sense of coherence, parental coping strategies and parents’ QoL in caring for autism child, respectively.

- i. Instrument to assess perceived autism child characteristics
The 12-item Child Symptoms questions from Autism Family Experience Questionnaire (AFEQ)

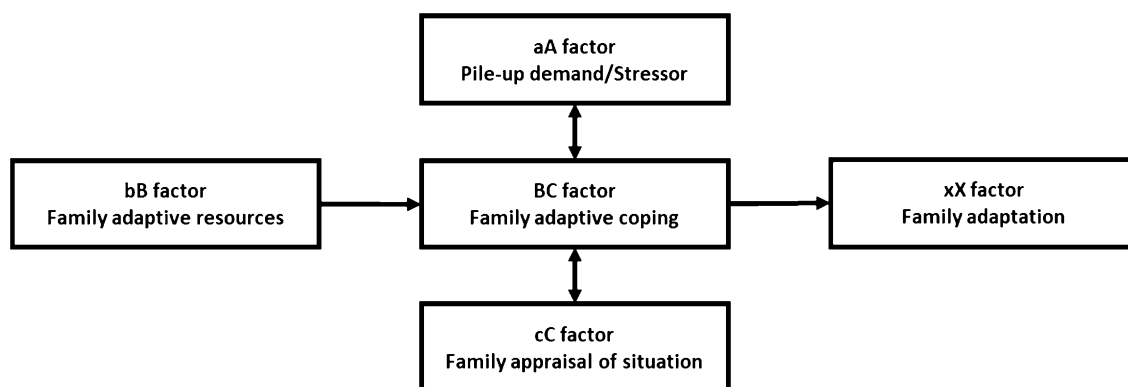


Fig. 1 The Double ABCX model (McCubbin & Patterson, 1983)

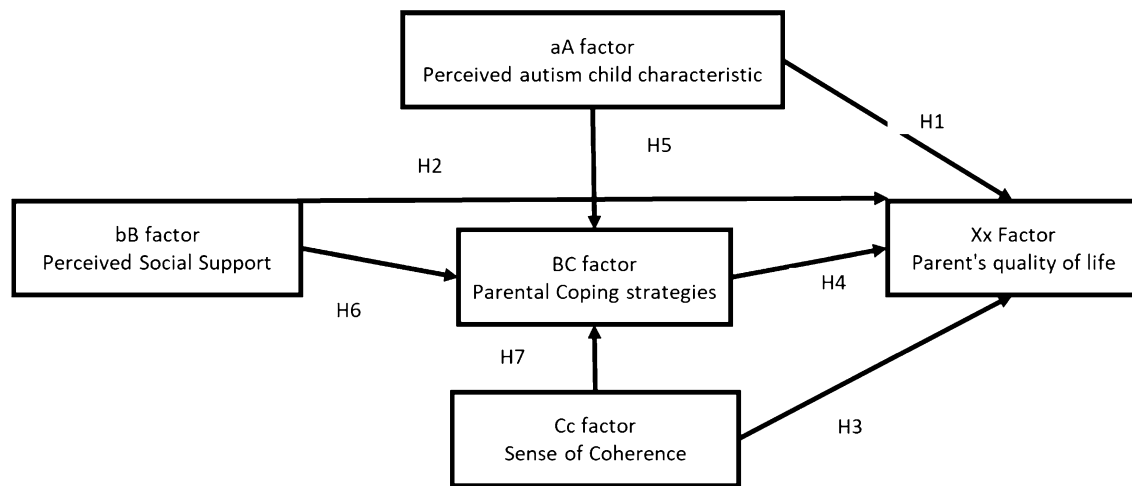


Fig. 2 The study hypothesis

(Leadbitter et al., 2018) was used to assess parent's perception regarding his or her autistic child's emotional health and behaviour. The example of statement in AFEQ is "My child is happy". A 5-point Likert scale ranged from 1 (always) to 5 (never). The AFEQ was divided into two subsections; good behaviour consists of 6 items and the remaining 6 items for measuring bad behaviours. Items on bad behaviours were reversely scored. The total score is ranged between 12 and 60. The higher score signifies maladaptive child behaviour. The AFEQ showed good reliability (Cronbach's alpha: 0.79) (Leadbitter et al., 2018). Similarly, an acceptable Cronbach's alpha was 0.81 was obtained from the present study. For subdomains, good behaviours items has a Cronbach's alpha of 0.82, while bad behaviours items reported Cronbach's alpha of 0.89.

ii. Instrument to assess perceived social support

A Multidimensional Scale of Perceived Social Support (MSPSS) by Zimet et al., (1988) was used to measure parents' perceived social support in caring children with ASD. It has three subsections which are family support (e.g., "I get the emotional help and support I need from my family"), friends support (e.g., "My friends really try to help me"), other supports (e.g., "There is a special person who is around when I am in need"). The tool consists of 12 statements with a 7-point Likert scale. The Likert scale is ranged from very strongly disagree to very strongly agree, with a higher score implying the adequacy of parents' social support. The alpha coefficient for MSPSS was 0.93 (Zimet et al., 1988). Similarly, the MSPSS for the current study had good reliability with Cronbach's alpha of 0.87. The Cronbach's alpha for subdomains, varies from 0.83 (family), 0.87 (friends), and others (0.95).

iii. Instrument to assess sense of coherence

The 13-item of the Sense of Coherence questionnaire to evaluate parents' sense of coherence (SOC) was adopted from Jakobsson (2011). It measures how comprehensible, manageable, and meaningful life to individuals. It has three subsections which are comprehensibility (e.g., "Has it happened in the past that you were surprised by how the relatives or friends behave toward you?"), manageability (e.g., "Do you have the feeling that you're being treated unfairly?"), and meaningfulness (e.g., "Do you have feeling that you don't really care about what goes on around you?"). These items were measured using 7-point Likert's scale. A higher score implies that a person has strong SOC and can cope successfully with life stressors. The Cronbach's alpha for this instrument was 0.82 (Jakobsson, 2011), which is similar to current study (0.82). The Cronbach's alpha for subdomains varies from 0.84 (comprehensibility), 0.91 (manageability), and 0.75 (meaningfulness).

iv. Instrument to assess parental coping strategies

The Caregiver Cope (CgCope) questionnaire (Ibrahim et al., 2017) was used to assess parental coping strategies. It comprises of 19-item rated using a 5-point Likert scale. It has six subdomains which are distraction (e.g., "I distance myself from him/her by concentrating on other tasks"), caring (e.g., "I pay more attention to him/her"), venting (e.g., "I speak in high tone"), religion (e.g., "I read religious and spiritual books such as Quran, Bible and others"), recreation (e.g., "I exercise"), social support (e.g., "I ask necessary help from others"). The total score for CgCope is ranged from 19 to 95. A higher rating suggests a better parental coping mechanism. The internal consistency reliability of CgCope was ranged from 0.54 to 0.82 (Ibrahim et al., 2017). Cronbach's alpha

coefficient for this study was 0.83. For subdomain, Cronbach's alpha varies from 0.626 (distraction), 0.82 (caring), 0.80 (venting), 0.86 (religion), 0.76 (recreation) and 0.86 (social support).

- v. Instrument to assess the quality of life of parents with ASD children

The 28-items Quality of Life in Autism Questionnaire (QoLA) by Eapen et al., (2014), was used to assess parents' quality of life in raising an autistic child. This tool uses a 5-point Likert scale and a total score ranging from 28 to 140. It has five subsections which are self-satisfaction (e.g., "I am satisfied with my life"), negative psychological aspect (e.g., "I feel stressed"), community support (e.g., "I can get the support that I need from the community"), and health satisfaction (e.g., "I am satisfied with my general health"), and financial status (e.g., "I have enough money to meet my needs"). The higher score is suggestive of parents having a good quality of life. The internal consistency reliability for QoLA was 0.92 and had a concurrent validity as WHOQOL-BREF (Eapen et al., 2014). The alpha coefficient for QoLA in the present study was 0.92. For domain-wise Cronbach's alpha varies from 0.93 (self-satisfaction), 0.78 (negative psychological aspect), 0.82 (community support), 0.89 (health satisfaction), and 0.84 (financial status).

The original instruments were in English language, which translated into Bahasa Malaysia and then translated back into English to ensure relevancy and understanding of the items. Furthermore, back-to-back translation was done to ensure the translated version of instrument had similar meaning with the original instruments. The written informed consent of parents was taken prior to collecting the data. The questionnaire was placed and given to parents inside the envelope. Parents were given 7 days to complete the self-administrated questionnaire to return the completed questionnaire to the rehabilitation centre where their child received care.

Data Analysis

Statistical Package for Social Sciences (SPSS) version 22.0 was used. Univariate analysis was used to describe parents and autistic children's demographic characteristics. The *structural relationship* was examined using path analysis in the Warp PLS 6.0 software. Path analysis examines the structural relationship as well as the direct and indirect path simultaneously. A two-tailed level of statistical significance was set at $p < 0.05$ for all analyses.

Results

Parents' Sociodemographic and Autism Child Characteristic

A total of 260 parents with ASD children participated in this study. The mean age was 37.9 (SD = 6.8), ranging from 24 to 65 years old Table 1. Based on the ethnic groups, most of the parents were Chinese 95 (36.5%), followed by Malay 60 (23.1%), and Iban 50 (19.2%). Among the participants, 35.4% of parents were government servants, followed by parents who did not work, including housewives (25.8%) and parents who worked in the private sector (23.8%). The median monthly family income was approximately MYR 3000 (USD: 739.19). About half of the participants (51.2%) participated in the autism support group. However, more than half (58.5%) never participated in any parenting training activities.

One hundred and forty-two autistic children were involved in the study. The mean age of these children was 7.9 years (SD = 3.98). The mean age children diagnosed with ASD was 3.5 years (SD = 1.3). The majority of them were boys (82.4%). Most parents enrolled their autistic child (60.6%) in both private and public rehabilitation centers, 26.8% in public institutions, while only 12.7% children only attended private centers. About 22.5% of autistic children were not registered under the Sarawak Welfare Department Table 2.

The QoL of Parents with ASD Children and Its Influencing Factors

The QoLA total score was used for categorizing the level of QoL through visual binning with one standard deviation cut-off point. Based on the QoLA total score, 15.8% of parents had a high quality of life, followed by 31.9% of them had a good quality of life. 11.2% of them had a low quality of life Fig. 3.

To identify factors influencing parents' QoL and its structural relationship, a robust path analysis with non-linear algorithm, bootstrapping resampling method was used for the analysis. All the model fitting information indicated a good fitted model. Model fitting and quality indices indicate are average path coefficient (APC) = 0.209 ($p < 0.001$), average R-square (ARS) = 0.330 ($p < 0.001$), average adjusted R-square (AARS) = 0.321 ($p < 0.001$), average block VIF (AVIF) = 1.285 (acceptable if $< = 5$, ideally $< = 3.3$), average full collinearity VIF (AFVIF) = 1.382 (acceptable if $< = 5$, ideally $< = 3.3$), Tenenhaus GoF (GoF) = 0.575, (small $> = 0.1$, medium $> = 0.25$, large $> = 0.36$),

Table 1 Characteristic of the parents ($n = 260$)

Variables	Frequency	%	Mean (SD)	Median (IQR)
Role to the child				
Mother	141	54.2		
Father	119	45.8		
Age (years)			37.95 (6.8)	
Ethnicity				
Chinese	95	36.5		
Malay	60	23.1		
Iban	50	19.2		
Bidayuh	33	12.7		
Melanau	15	5.8		
Others	7	2.7		
Religion				
Christian	129	49.6		
Islam	81	31.2		
Buddha	45	17.3		
Others	5	1.9		
Level of Education				
Diploma/Degree/Master/PhD	128	49.2		
Secondary school	122	46.9		
Primary school	10	3.9		
Marital Status				
Married	247	95.0		
Divorce/widow/widower	13	5.0		
Occupation				
Government	92	35.4		
Not working	67	25.8		
Private sectors	62	23.8		
Self-employed	39	15.0		
Family income (MYR)				MYR 3000 ¹
Autism support group participation				
Yes	133	51.2		
No	127	48.8		
Parental Training				
Yes	108	41.5		
No	152	58.5		

SD standard deviation, *IQR* interquartile range

Sympson's paradox ratio (SPR) = 1 (acceptable if $> = 0.7$, ideally = 1), R-squared contribution ratio (RSCR) = 1 (acceptable if $> = 0.9$, ideally = 1), Statistical suppression ratio (SSR) = 1 (acceptable if $> = 0.7$), and Nonlinear bivariate causality direction ratio (NLBCDR) = 1 (acceptable if $> = 0.7$).

Figure 4 and Table 3 revealed a structural path analysis of factors influencing the QoL of parents with ASD children. Perceived social support positively influenced the QoL of parents of children with ASD with a medium effect size ($\beta = 0.32$, $p < 0.001$, $ES = 0.17$). A sense of coherence was positively and directly influenced the QoL of parents of ASD children with a medium effect size ($\beta = 0.32$, $p < 0.001$,

$ES = 0.16$). However, sense of coherence did not directly influence the coping strategies of parents ($p > 0.05$). Perceived autism child characteristics did not have any direct influence on the quality of life of the parents ($p > 0.05$), but perceived autism child characteristics negatively influenced the coping strategies of parents with a small effect size ($\beta = -0.108$, $p < 0.05$, $ES = 0.022$). The QoL among parents with ASD children was also positively influenced by parental coping strategies with a small effect size ($\beta = 0.238$, $p < 0.001$, $ES = 0.108$). Perceived social support positively influenced parental coping strategies with a medium effect size ($\beta = 0.408$, $p < 0.001$, $ES = 0.178$). However, a sense of coherence did not directly influence the coping strategies of

Table 2 Characteristic of the autistic child ($n = 142$)

Variables	Frequency	%	Median (IQR)
Gender			
Boy	117	82.4	
Girl	25	17.6	
Current age (month)			95.20 ^a (47.86)
Age autism was diagnosed (month)			42.28 ^a (15.35)
Follow up care			
Both (Gov and Private)	86	60.6	
Government facilities	38	26.8	
Private facilities	18	12.7	
Registration with the welfare department			
Yes	110	77.5	
No	32	22.5	

SD standard deviation, IQR interquartile range

^aThe distribution is skewed to the right

the parents ($p > 0.05$). In general, perceived social support, sense of coherence and coping strategies explained about 46% of the total variance of parents' QoL ($R^2 = 0.46$).

Table 4 shows the role of coping strategies as mediator between perceived social support and parents' QoL and between sense of coherence and parents' QoL. The direct effects of perceived social supports toward the quality of life among parents of children with ASD were $B = 0.317$ ($p < 0.001$), but its direct effect was dropped ($B = 0.097$) and remained significant after the introduction of parental coping strategies, ($B = 0.414$, $p < 0.001$). Meanwhile, the direct effect of the sense of coherence with mediator decrease from 0.320 to 0.003 and was not significant, suggesting parental coping strategies as a total mediator in relationship between sense of coherence and parents' quality of life ($B = 0.324$, $p < 0.001$).

Fig. 3 Quality of life among parents of children with ASD

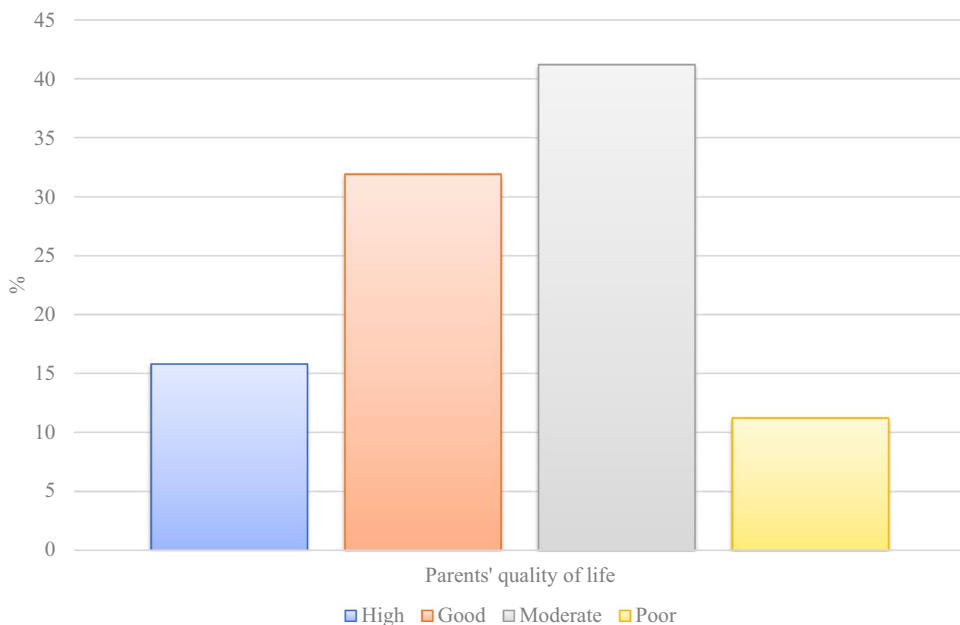


Table 3 Results of structural path analysis of factors influencing the quality of life among parents with an autism spectrum disorder child

Hypothesis	Parameters	Coefficient	SE	ES	Acceptance
H ₁	Quality of life among parents of children with ASD ← Perceived autism child characteristic	-0.058	0.061	0.019	Not Accepted
H ₂	Quality of life among parents of children with ASD ← Perceived social supports	0.317***	0.059	0.171**	Accepted
H ₃	Quality of life among parents of children with ASD ← Sense of coherence	0.320***	0.059	0.159**	Accepted
H ₄	Quality of life among parents of children with ASD ← Parental coping strategies	0.238***	0.060	0.108*	Accepted
H ₅	Parental coping strategies ← Autism child characteristic	-0.108*	0.061	0.022*	Accepted
H ₆	Parental coping strategies ← Perceived social supports	0.408***	0.058	0.178**	Accepted
H ₇	Parental coping strategies ← Sense of coherence	0.015	0.062	0.003	Not Accepted

ES Effect size (* = small (0.02), ** = medium (0.15) and *** = large (0.35))

p* < 0.05, *p* < 0.005, ****p* < 0.001

Discussion

In this study, perceived social support, sense of coherence and coping strategies of ABCX model have substantially influenced the QoL of parents with ASD children. Firstly, a sense of coherence positively and directly influences the quality of life of parents. A high sense of coherence is a protective factor towards parents' QoL in caring for the autistic child (Siah & Tan, 2016), mainly based on the experience gained. Parents are able to recognize their perception towards their autistic child, the needs and the availability of the assistance to help them in managing the special child. Thus, the caregiving experience gained could build parental resilience (Bayat, 2007; Blacher & Baker, 2007; Scorgie & Sobsey, 2000). Despite having various hardship, caregivers able to cope and adapt to the autistic child issue (Manning et al., 2011). Furthermore, parents show positive experience, proactive and attitude managing their child (Bayat, 2007; Russell & Norwich, 2012).

While sense of coherence is noted as a protective factor towards parent's QoL, perceived social support in the present study could also lead to good parent's QoL too. Spouses,

friends, extended family members, healthcare professionals and community could be the source of family and organizational support for parents (Hall & Graff, 2011). Informal social support from family members is the common social support of choice compared to friends or others. Families can help parents to get brief break physically, mentally and financially such as taking care of their autistic child for parents to have a short vacation (Ilias et al., 2017). Substantial social support is needed for parents while taking care of an autistic child. This result is matched with those observed in the earlier studies mentioned that adequate social support from friends or the family able to reduce the challenges and stressors of raising autistic children (Tichovolsky et al., 2013; Yingling et al., 2018). Thus, leading to increase life satisfaction among parents (Cetinbakis et al., 2020) and improve parents' quality of life (Bohadana et al., 2019).

Parents perceived autistic child characteristics was the only factor in the double ABCX model did not show any significant relationship toward the parents' QoL. The possible explanation could be related to parents' acceptance of their child medical condition and adapted to what God already granted the child to them (Ilias et al., 2017). Even

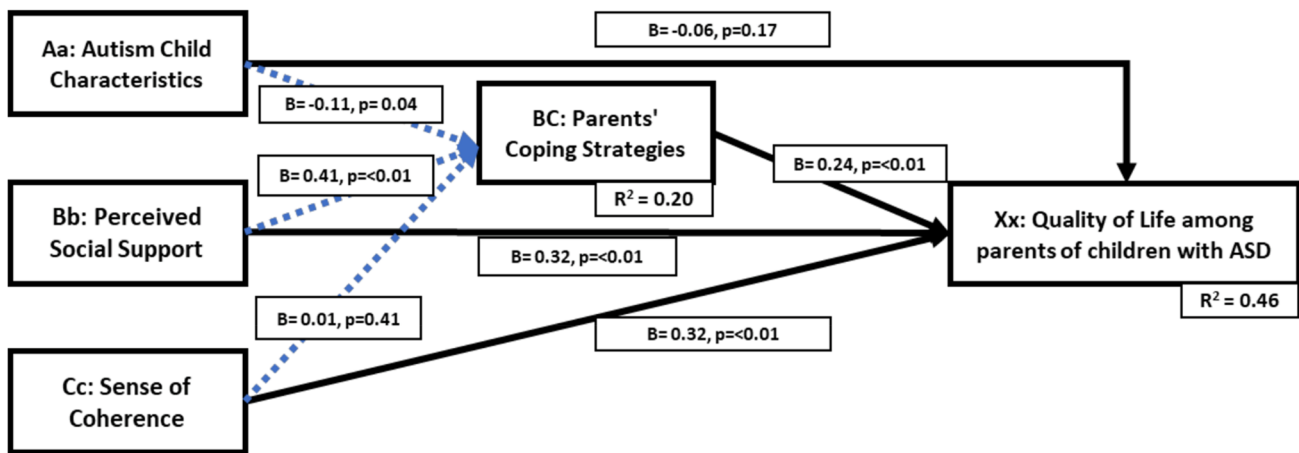


Fig. 4 Structural path analysis of factors influencing the quality of life among parents with ASD

Table 4 Results of the indirect and total effect of factors influencing the quality of life among parents with an autism spectrum disorder child

Hypothesis	Parameters	Direct B without a mediator	Direct B with a mediator	Indirect B	Type of mediation
H ₁	Quality of life among parents of children with ASD ← Parental coping strategies ← Perceived autism child characteristic	-0.058	-0.026	-0.084	No mediation
H ₂	Quality of life among parents of children with ASD ← Parental coping strategies ← Perceived social supports	0.317***	0.097*	0.414***	Partial mediation
H ₃	Quality of life among parents of children with ASD ← Parental coping strategies ← Sense of coherence	0.320***	0.003	0.324***	Total mediation

* $p < 0.05$, ** $p < 0.005$, *** $p < 0.001$

though it is hard for parents to understand and to be burdened with a lifelong responsibility to provide the best care for the children (Khanna et al., 2011), they also want the best for their child as same with other siblings. Marciano et al., (2015) reported that parents feel more bonded with other family members while caring of their autistic child. We know that autism reshaped the life of parents. They also need to explore new norm or balance in the family routine to the presence of an autistic child to cope with and fulfil the need for a special child. With good social support and appropriate coping strategies, plus with the treatment from health providers, they can live as near as normal person. Although previous studies mentioned autism features such as such as stereotyping, insomnia, selective foods, and tantrum, negatively could influence the parental quality of life (Alhazmi et al., 2018; Arora et al., 2020; Cetinbakis et al., 2020; Khanna et al., 2011; Øien & Eisemann, 2016), parents of children with ASD must utilized the social support and coping strategies in dealing with them.

In this study, parental coping strategies is the mediator variables in influencing the QoL among parents of children with ASD. Coping was described by Lazarus and Folkman (1984) as a behavioural and cognitive action used to mitigate or accommodate the stressors. They also classified coping styles as problem-focus and emotion-focus coping strategies. In this study, most parents opted problem-focus strategies (e.g., caring, religion) compared to emotion-focus strategies (e.g., venting or distraction) in dealing with their autism child. Those parents using problem-focus strategies has been significantly associated with a good health outcome compared to individual adapted emotion-focus coping (Dabrowska & Pisula, 2010; Pottie & Ingram, 2008; Pozo & Sarriá, 2014).

Significantly, parental coping strategies able to mediate the effect of a sense of coherence on the quality of life among parents of children with ASD. This finding reported earlier indicates that the sense of coherence indirectly influence the quality of life of parents through the coping strategies. The strong sense of coherence parents favourably appraised the situation of child autism, which contributes to a better quality of life (Paynter et al., 2013; Pozo et al., 2014; Siah & Tan, 2016). Parents not only need to appraise the situation, but they also need to act using appropriate coping strategies to ensure their well-being at optimal level in dealing with autism child. Parents with a high sense of coherence were associated with adapting positive coping strategies to deal with autism-related issues (Pisula & Kossakowska, 2010).

Parental coping strategies have also partially mediated the effect of perceived social support on the quality of life among parents of children with ASD. Historically, social support has been considered as a protective factor in affecting the parental quality of life. Perceived social support help in alleviating and avoiding psychological distress in a family

of children with ASD (Ma & Mak, 2016). Social support has consistently acted as a stress buffer in helping parents of children with ASD cope successfully (Benson, 2016; Khanna et al., 2011).

Study Limitation

The study encountered a few number of limitations which must be taken into consideration. First, the present research opted for a cross-sectional study design and led to the difficulty to determine the temporal and causal relationships. Secondly, the current study used a purposive sampling in recruiting parents. The finding of the study may not be generalised to all parents of autistic children. The limitation of using the self-administrated questionnaire is that it contributes to recall bias. The qualitative aspect shall be integrated with the questionnaire to provide a clear picture of factors influencing parents of children with ASD.

Study Conclusion

In summary, perceived social support, sense of coherence and parental coping mechanism showed a significant relationship influencing the quality of life among parents of children with ASD. The role of parental coping strategies as mediators to social support and sense of coherence is important to be considered in health promotion programme. The practitioners can use this finding and collaborate with parents focusing on the appraisal towards their autistic child and promote full use of available resources to enhance parents' QoL. The parental interventional program can be implemented focusing on the importance of social support, sense of coherence and parental coping strategies in dealing with autistic children.

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Author Contributions Ismail and Safii have devised the main conceptual idea. Ismail and Saimon had designed the model, conceptual framework, and adapted to the theory. This study was supervised by Safii and Saimon. Rahman conducted data analysis using Warp PLS. Ismail conducted the project from data collection, designed the figures, and drafted the manuscript. All authors viewed the interpretation of the finding. Ismail wrote the manuscript with assistance and input from Safii and Saimon. All authors read and approved the final manuscript

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Data Availability The full data will be available in Universiti Malaysia Sarawak (UNIMAS) repository upon thesis submission by Mohd Fahmi Ismail.

Compliance with Ethical Standards

Conflict of interest The authors declared to have no conflict of interests to the content of this article.

Ethical Approval Ethical approval was obtained from the Universiti Malaysia Sarawak Ethics Committee (UNIMAS/NC-21.02/03-02 Jld.3 (78)) on 14th February 2019. This study was conducted in line with the principle of the Declaration of Helsinki 1964.

Consent to Participate The permission to conduct this study at the public and private autism rehabilitation institutions has been obtained. The researchers provided informed consents form to parents with a detailed explanation regarding research. Participation in the present study was voluntary. Researchers protected respondents' privacy, anonymity, and confidentiality.

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