



(RESEARCH ARTICLE)



## Predictors of parenting stress among mothers raising children with autism spectrum disorder (ASD) in the sultanate of Oman: A cross-sectional study

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### Abstract

**Background:** Several studies among parents of children afflicted with ASD reported higher levels of parenting stress compared to parents of other children with intellectual disabilities (ID) or typically developing (TD) children (Miranda et al., 2019). Also, Omani literature postulates that Omani parents of children with ASD endure a higher parental burden, clinically significant stress levels, anxiety, depression, and an increased public stigma compared to parents of TD children. However, relatively little is known about parental stress constructs in the Omani literature.

**Research Design:** A cross-sectional design was used to test a predictive model of parental stress in mothers raising children diagnosed with ASD in the Sultanate of Oman.

**Aims:** This study examined mental health, parental burden, and affiliate stigma as predictors of parenting stress. It also examined the mediating role of self-compassion and the moderating role of coping strategies and social support between these potential predictors and parenting stress. **Results:** Results showed that affiliate stigma and parental burden were significant predictors of parenting stress.

Self-compassion partially moderated the relationship between mental health, parental burden, and parenting stress. Implications are discussed in light of supporting programs and interventions to help these mothers cope and ultimately improve the quality of life in families of children with ASD.

**Conclusion:** The findings highlight the importance of addressing parental burden and stigma in supporting parents and promoting family well-being

**Keywords:** Parenting; Parenting stress; Autism; Children; Oman

### 1. Introduction

In recent years, autism spectrum disorder (ASD) prevalence has risen. The median prevalence estimate of ASD was found to be 62/10000 in a systematic review of epidemiological surveys (Elsabbagh et al., 2012). The rate of ASD in the U.S. went from 1 in 150 in 2000 to 1 in 100 in 2022. In congruent with this trend, Arab countries manifest a high rate of ASD (AL-Batti et al. 2022). These countries have shared geographical locations, ethnic backgrounds, and lifestyles. Moreover, genetic exposures such as consanguinity, which is the marriage between two blood-related individuals who are second cousins or closer (Islam 2017), and multiparity are common in these countries. Epidemiological research into ASD in the Gulf Corporation Countries (GCC), which includes Saudi Arabia, Oman, Kuwait, Bahrain, Emirates and Qatar, is relatively new, and rates of ASD in this part of the world is still unclear. A more recent systematic review

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showed that the prevalence of ASD in Arabian Gulf countries, including Saudi Arabia, ranged from 1.4 to 29 per 10,000 population, lower than the prevalence rate measured by studies conducted in developed countries (39–77 per 10,000) (AL-Batti et al. 2022).

### 1.1. Parenting stress in ASD

ASD is associated with comorbid medical and neurological conditions that affect mental health status and Quality of Life (QOL) of those with the conditions, as well as their families and caregivers (Yaacob et al., 2021). Those with ASD often require daily care, follow-up, and adjustment, which adds to parental stress (Hartley et al., 2016). Literature in this field provides further evidence that parents of children with ASD experienced high levels of parenting stress, with 56% reaching clinically significant levels of stress (Li et al., 2018). Additionally, several studies among parents of children afflicted with ASD reported higher levels of parenting stress compared to parents of other children with ID or TD children (Miranda et al., 2019).

Furthermore, parenting stress among families with children with ASD exceeds, with large effect size, the stress of parents with children with other neurodevelopmental disorders, such as specific learning disorders, intellectual disabilities, Down syndrome, cerebral palsy, externalizing behaviors, or attention deficit hyperactivity disorder (Gupta, 2007; Hayes and Watson, 2013; Watson et al., 2013; Craig et al., 2016; Barroso et al., 2018). Scholars also presented several parental factors associated with parental stress such as parental burden, anxiety, stress, depression, coping strategies, and perceived social support. For instance, parents of children with ASD exhibit high to moderate levels of parental burden (Barroso et al., 2018; Bozkurt et al., 2019; Picardi et al., 2018), which in turn may increase parenting stress among parents rearing children with ASD.

### 1.2. ASD in Oman

Oman, officially, the Sultanate of Oman, is a country on the southeastern coast of the Arabian Peninsula in Western Asia. It covers an area of 309,500 km<sup>2</sup>. In 2011, the prevalence of ASD in Oman was estimated to be 1.4 per 10,000 children. In 2011, the prevalence of ASD in Oman was estimated to be 1.4 per 10,000 children. However, researchers in Oman presume this was an underestimation due to underdiagnosis and under-reporting of ASD cases (Al-Farsi et al., 2011). In 2018, the overall estimate of the prevalence of ASD in Oman was 20.35 per 10,000 children (15-fold more than the estimate in 2011), which means that 0.2 percent of children in Oman are on the autism spectrum (Al-Mamari et al., 2019).

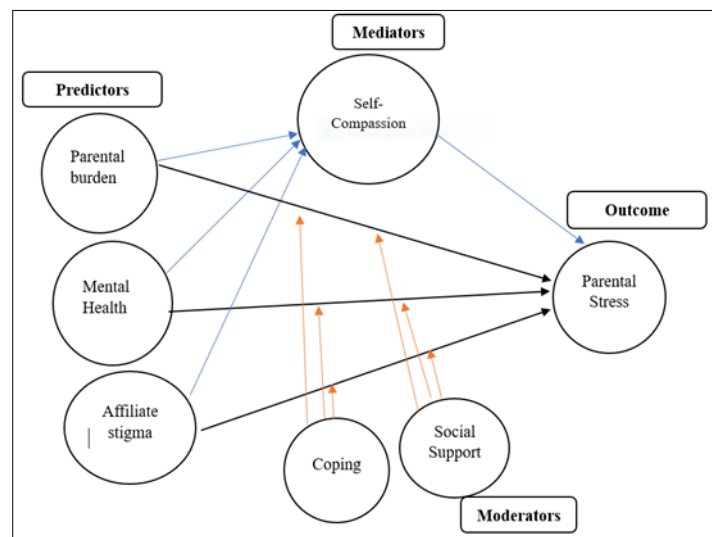
In parallel to the Western literature, Omani literature postulates that Omani parents of children with ASD endure a higher parental burden, clinically significant stress levels, anxiety, depression, and a lower quality of life (Al-Farsi et al., 2016, 2021; Y. M. Al-Farsi et al., 2013; Alshekaili, Al-Balushi, Mohammed Al-Alawi, et al., 2019; Maskari et al., 2018). Omani parents raising children with ASD have a higher risk of depression and stress by 1.8 and 1.6 times, respectively, compared to parents raising TD children.

Research on ASD is relatively limited in developing countries, including Oman, and thus most of the current clinical practices in Oman are based on conclusions from studies conducted in Western developed countries. Although a marked growth in local research started to emerge in 2008, there is much that still has to be investigated. For instance, parenting stress resulted from raising children with ASD in Oman has not yet been deeply explored. Hence, Arab researchers at the first Gulf Corporation Countries (GCC) conference for ASD in Oman in January 2020 highlighted the need to develop strategies for coping with parental stress and improving parental QOL through training [e.g., parenting support, psychoeducation sessions, and Parent-Mediated Interventions (PMI)] (University, 2020). However, relatively little is known about parental stress construct in the Omani literature. The vast majority of the work in this area has focused on ASD screening, diagnosis, treatment modalities, families' QoL, families' depression and anxiety, and nutrition-based therapy. No known study in Oman has explicitly focused on examining parental stress and its predictors among parents of children affected with ASD. The primary aim of the study was to test whether anxiety, stress, depression, parental burden and affiliate stigma predict parental stress among Omani parents caring for children with ASD. The secondary aims were a) to determine the levels of parental stress, parental burden, anxiety, stress, depression, affiliate stigma, perceived social support and self-compassion among Omani mothers raising children with ASD; b) to test whether parental self-compassion mediates the relationship between the predictive variables (anxiety, stress, depression, parental burden, affiliate stigma) and parenting stress; and c) to test whether perceived social support and coping strategies moderate the relationship between parental stress and its potential predictors.

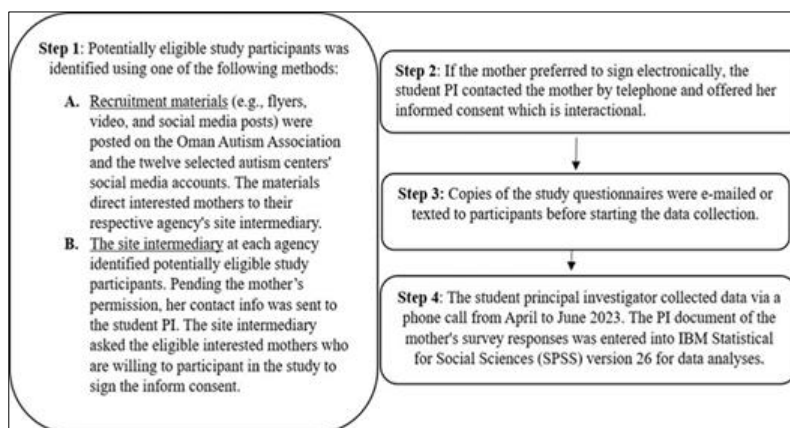
## 2. Material and Methods

### 2.1. Design, setting, and participants

A cross-sectional design was used to test a predictive model of parental stress in mothers raising children diagnosed with ASD in the Sultanate of Oman. The sample size for multiple linear regression analysis was estimated by the use of statistical power analysis software (G\*Power analysis) version 3.1 (considering the six independent variables). Based on G\*Power analysis, a sample of 100 mothers was required to detect an effect size of .15,  $p = .05$ , and .80 power). Six regions (Muscat and South Sharqiyah, the Dakhiliyah, the North Batinah, the South Batinah, and the South Sharqiyah) were selected to recruit 100 Omani mothers raising children with ASD. These six regions have the highest rates of ASD cases in Oman (Al- Mamari et al., 2019). More than one-third (37.3%) of the ASD cases were recorded in the Muscat governorate, followed by North Batinah (15.7%), Dakhiliyah (13.5%), Al-Batinah South (10.7%), and Al-Sharqiyah South (8.2%). Participants were recruited using a convenience sampling approach from The Omani ASD Association and twelve ASD centers in these six regions (see the appendix: list of selected ASD centers). These centers (governmental or private centers) are both working under the umbrella of the Ministry of Social development (MoSD).



**Figure 1** The Theoretical Framework Predicting Parenting Stress among parents raising children with ASD



**Figure 2** Description of identification, consenting, and data collection phases

After obtaining the contact information for the interested eligible participants, the principal investigator sent a package to each institution (through each institution's moderator) via e-mail or handed hard copies to them personally. An information sheet and informed consent forms were included in the package. Meanwhile, through WhatsApp audio and text messages, the principal investigator interacted with mothers to answer their questions about the forms and study. Upon the mother's agreement to participate, the moderator asked her to sign the informed consent. The principal researcher collected the signed consents from each institution. The PI collected data via a phone call (98% of the

participants) or a face-to-face interview (2%) from March to April 2023. The PI documented the mother's survey responses within the SPSS version 26.

### 2.1.1. Eligibility criteria

Eligibility criteria for the study include 1) women of Omani nationality, 2) raising children diagnosed with ASD from one of the three main ASD diagnostic centers in Oman: Sultan Qaboos University Hospital, Royal Hospital, and Al-Massarrah Hospital, 3) child's age between 2-12 years, 4) mothers' age is 18 years and older, 5) WhatsApp accessibility and skills and 6) understand and speak Arabic. Exclusion criteria are 1) cognitive impairment, 2) inability to provide informed consent, and 3) do not understand or speak Arabic.

### 2.1.2. Ethical consideration

Ethical approval was obtained from the Research and Ethical Review and Approve Committee (RERAC) in the Ministry of Health (MoH), Sultanate of Oman. The researcher also contacted the Ministry of Social Development (MoSD), represented by the department of study and research, to submit a copy of the proposal and the approval letters. The author also filled an online study facilitation request. After review, the MoSD produced an official letter to the selected ASD centers under its umbrella in various governorates to encourage them to cooperate and facilitate this study's endeavors.

### 2.1.3. Measures

Copies of the study questionnaires were e-mailed or electronically texted to participants before starting the data collection. To minimize the instrument burden, the researcher tested the time it takes to administer each study measure on five mothers raising typically developing children. Completion of the assessments took approximately 35-45 minutes.

#### Demographic Data:

The first page of the questionnaire measured the characteristics of mothers. For example, mothers were asked about their age, employment status, educational level, and marital status.

**Parental Stress Scale (PSS; Berry & Jones, 1995):** Self-report questionnaire was used to assess the stress of parents caring for children having ASD and those caring for TD children (Berry & Jones, 1995). This validated questionnaire consists of an 18-item scale that describes the parent's feelings towards the relationship with their children (Louie, Cromer, & Berry, 2017).

Coping styles was measured by the abbreviated version of **the COPE Inventory** (Carver, 1990). **The Brief COPE** is a 28-item scale that measures the ways individuals cope with stress in their life. Specifically, how frequently they employ 28 different behaviors and cognitions when coping with a specific stressful situation (in the present study, parenting a child with autism). It is comprised of 14 domains (acceptance, active coping, planning, behavioral disengagement, denial, substance use, humor, positive reframing, religious coping, self- distraction, use of emotional support, use of instrumental support, and venting emotions), each consisting of 2 items.

The **Self-Compassion Scale (SCS; Neff 2003a)** is a self-reported, 12- item measure with responses ranging from 1 (almost never) to 5 (almost always). Average overall self-compassion scores are typically 3.0 on the 1-5 scale. Score ranges: 1-2.5 overall self-compassion score indicates low in self-compassion (Neff 2003a). 2.5-3.5 indicates moderate and 3.5-5.0 indicates high self-compassion.

**The Multidimensional Scale of Perceived Social Support (MSPSS)** was used to measure satisfaction with social support. MSPSS (Zimet et al., 1988) is a 12-item instrument used to measure the adequacy of social support from three specific sources: family, friends, and significant other. Significant other refers to a "special person" that may be interpreted differently by respondents (Zimet et al., 1988). The Family, Friends, and Significant Other subscales each have four items, all rated on a 7-point scale (1 = very strongly disagree to 7 = very strongly agree). The Cronbach's alpha of the total scale was 0.88 among a sample of 275 adult men and women (Zimet et al., 1988).

The 22-item **Affiliate Stigma Scale** (Mak and Cheung 2008) was used to measure the extent of internalized stigma among parents of children with ASD. Participants rated on a 4-point scale from (1) strongly disagree to (4) strongly agree. The total score is the mean score of the 22 items. The higher the score, the greater the level of affiliate stigma. Therefore, a translation and back translation of the questionnaire was accomplished with an expert team.

**Depression Anxiety Stress Scales (DASS-21; Lovibond and Lovibond 1995)** was used to measure mental health among participants. DASS-21 is used to measure parental distress and negative emotional states like depression, anxiety and stress, and psychological well-being during the last week (DASS-21; Lovibond & Lovibond, 1995b). It is a brief and short-form generated from 42-item DASS in which each of the three subscales 63 comprises seven items instead of fourteen (Firth & Dryer, 2013) that measures the frequency of behaviors or intensity of feelings based on three subscales of anxiety (DASS-A), depression (DASS-D) and stress (DASS-S).

**Parental Burden** was measured utilizing Zarit Burden Interview (ZBI). It is a tool that was used to identify families with possible caregivers' distress (Zarit, 1985). To measure parental burden, a version of the 22-item was used to assess the burden on family caregivers of disabled persons (Ikeda et al, 2012). The ZBI describes some troubles that have been faced by caregivers like their physical and psychological health, finances, social life, and the relationship with the patient (Gallagher et al, 2008).

### 3. Results

The majority of mothers were between 35 to 44 years of age; this range accounted for 57% of the sample. Younger mothers, aged 25 to 34, constituted 23% of the sample, the second largest age group in the sample. Mothers 45 to 54 represented 17%; another 3% were mothers aged 55 or older. Most mothers were educated (87%). Most participants were high school graduates (47%), 31% had college degrees, and 3% had higher education (master's degree). Illiteracy was not prevalent in this sample; only 8% of mothers had no schooling or nursery school education up to the eighth grade (1% and 7%, respectively). Only 34% of surveyed mothers were employed; 66% were not currently employed outside the home and were housewives. Most mothers (89%) were married, while 11% were divorced. As for the geographical distribution of respondents, the majority of whom resided in the North Batinah region (46%), followed by Muscat (25%) and South Batinah (21%). Moreover, a total of twelve autism centers as well as the Oman AS Association (OAA) were included in the study (see the Table1)

**Table 1** Demographic characteristics of the respondents

Characteristics	N	%
<b>Age</b>		
25-34	23	23.0
35-44	57	57.0
55 or older	3	3.0
<b>Education</b>		
No schooling completed	1	1.0
Nursery school up to 8th grade	7	7.0
Some high school, no diploma	11	11.0
High school graduate, diploma	47	47.0
College degree	31	31.0
Master/Ph.D. degree	3	3.0
<b>Employment</b>		
Employed	33	33.0
Not Employed	66	66.0
<b>Marital Status</b>		
Married	89	89.0
Divorced	11	11.0
<i>Note: N=100.</i>		

The DASS21 was used to measure anxiety, stress, and depression. Maternal anxiety had a mean score of 23.44 (SD=11.76), a median of 28.00, and a mode of 36.00, reflecting an extremely severe anxiety level among participants (Zarit et al. 1980). Stress, as a separate construct from parental stress, had a mean score of 26.10 (SD=10.33) and a median and mode of 30.00. These values reflect severe stress among respondents (Henry & Crawford 2005, Lovibond & Lovibond 1995). On the other hand, affiliate stigma scale (ASS) was used to measure the extent of the internalized stigma among the participants. Mothers' Affiliate Stigma scores had a mean score of 2.70 (SD=0.37) and a median of 2.64; the mode was 2.32. Affiliate stigma scores indicate that there is mild affiliate stigma among respondents (Mark and Cheung 2008).

Social support was measured by the Multidimensional Scale of Perceived Social Support (MSPSS). Total and subscale scores (significant other, family, and friend social support) were assessed. Total social support had a mean score of 4.90 (SD=0.75), a median of 4.83, and a mode of 4.50. These parameters reveal moderate social support among mothers in the study sample (Zimet et al. 1990). The subscale of "significant other" had a mean score of 5.84 (SD=1.12), a median of 6.00, and a mode of 7.00. These scores show high support from significant others as reported by mothers in this sample (Ramaswamy et al. 2009; Zimet et al. 1990). The family subscale in the social support scale had a mean score of 4.86 (SD=0.91), a median of 4.75, and a mode of 4.50. Participants claimed they received moderate social support from family (Zimet et al. 1990). The friend subscale had a mean score of 3.99 (SD=1.00), a median of 4.00, and a mode of 4.00, which indicated moderate social support. In summary, social support scores reflect moderate social support from family and friends but high social support from significant others. An assessment of self-compassion was computed using the Self-Compassion Scale (SCS). Results showed a mean score of 2.94 (SD=0.63), a median of 2.96, and a mode of 2.92, indicating a moderate level of self-compassion (Neff 2003, Neff 2011) (see Table 2).

**Table 2** Measures of Central Tendency of Study Variables

Mean, Media, Mode, SD, Theoretical range and Cut-off values for each variable				
Variables	M	Median	Mode	SD
<b>Parenting Stress</b>	63.06	63	72	12.35
<b>Parental Burden</b>	51.06	53	64	12.72
<b>Mental Health</b>				
Anxiety	23.44	28	36	11.76
Stress	26.1	30	30	10.33
Depression	18.98	21	22	10.11
<b>Stigma</b>	2.7	2.64	2.32a	0.37
<b>Social Support</b>				
Total	4.9	4.83	4.5a	0.75
Significant other	5.84	6	7	1.21
Family	4.86	4.75	4.50a	0.91
Friend	3.99	4	4	1
<b>Self-Compassion</b>				
Problem-Based Coping	2.83	2.75	2.5	0.44
Emotional Based Coping	2.64	2.67	2.67	0.35
Avoidant Coping	1.61	1.5	1.5	0.31
Note: N=100.				
a. Multiple modes exist. The smallest value is shown.				
* The higher the score, the greater the level of affiliate stigma				
**The higher the scores, the more frequently use of the coping strategy				

### 3.1. Predictors of parenting stress

The overall regression model was statistically significant ( $Adj R^2 = .76, F(9,85) = 34.166, p < .001$ ). This suggests that the model as a whole provides a good fit for predicting parenting stress based on the selected predictors. The regression model accounted for 76.1% of the variance in the dependent variable, parenting stress. Parental burden ( $\beta = 0.554, p < .001$ ) and stigma scores ( $\beta = 0.341, p < .001$ ), significantly predicted parenting stress scores. The other remaining predictors were not significantly predicting parenting stress (Table 3).

**Table 3** Predictors of parenting stress

Variables	Model (a)					Model (b)				
	B	SE	Beta	t	p	B	SE	Beta	t	p
constant	0.86	0.07		13.121	<.001	0.85	0.10		8.21	<.001
Anxiety	0.02	0.03	0.06	0.63	0.53	0.01	0.02	0.053	0.544	0.588
Stress	-0.01	0.03	-0.04	-0.512	0.61	-0.01	0.02	-0.043	-0.49	0.625
Depression	0.01	0.03	0.05	0.515	0.608	0.02	0.03	0.06	0.594	0.554
Parental burden	0.40	0.06	0.55	7.323	<.001	0.40	0.05	0.554	7.009	<.001
Affiliate stigma	0.53	0.11	0.36	4.918	<.001	0.50	0.11	0.341	4.539	<.001
Age						-0.01	0.01	-0.061	-1.026	0.308
Level of Education						0.01	0.01	0.071	1.059	0.293
Employment status						0.01	0.01	0.05	0.784	0.435
Marital status						0.01	0.014	0.033	0.639	0.525
Adj R <sup>2</sup>		0.763					0.761			
F		61.632					34.166			

Note: N=100; Model (a): without controlling for the mother’s characteristics (age, etc.); Model (b): controlling for mother’s characteristics; a Dependent Variable: logps

### 3.2. Self-compassion as a mediator

Prior to testing the mediation hypothesis, Pearson correlations were computed between study predictors; all variables were significantly related to each other; See Table 4. Simple and multiple linear regression analyses were used to test the mediation model; see Table 4.11. Results revealed that self-compassion partially mediated the relationship between Parenting stress and predictor anxiety, stress, depression, and parental burden but did not mediate affiliate stigma. Acknowledging the criticism of Baron and Kenny’s approach, a second more contemporary mediation analysis was used: bootstrapping using Hayes SPSS version 4.2 Process Macro Test (Hayes 2018). A bootstrapping method was performed using SPSS Process Macro version 4.2 to examine if self-compassion mediated the relationship between anxiety, stress, depression, parental burden, affiliate stigma and parenting stress.

**Table 4** Zero-order correlations between predictor study variables

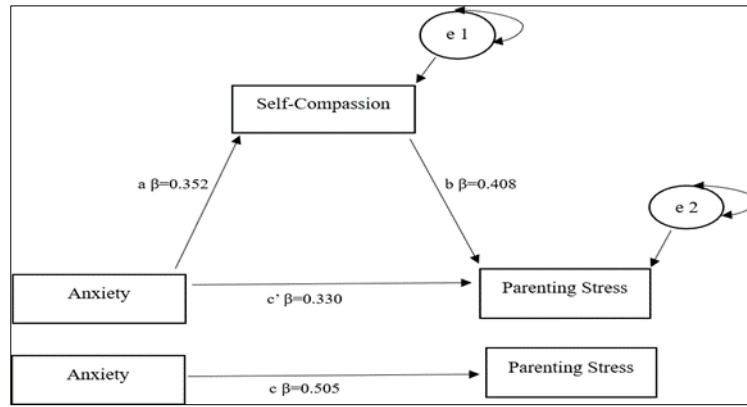
Variable	1	2	3	4	5	6	7
1. Parenting stress	—						
2. Anxiety	.50**	—					
3. Stress	.51**	.78**	—				
4. Depression	.44**	.70**	.78**	—			
5. Parental burden	.86**	.50**	.53**	.42**	—		
6. Affiliate Stigma	.79**	.49**	.47**	.42**	.74**	—	
7. Self-Compassion	-.64**	-.35**	-.32**	-.33**	-.65**	-.69**	—

**Table 5** Results of Mediation analysis (Baron and Kenny, 1986)

Variable	Model tested	Path	B	SE	$\beta$	t
<b>Anxiety</b>						
Anxiety-> parenting stress		c	.13	.02	.505***	5.77
Anxiety -> self-compassion		a	-.11	.03	-.352***	-3.7
Self-compassion -> parenting stress		b	-.55	.07	-.498***	-6.3
Anxiety->self-compassion-> parenting stress		c'	.09	.02	.330***	4.17
<b>Stress</b>						
Stress-> parenting stress		c	.14	.03	.457***	5.51
Stress_Self-compassion		a	-.48	.07	-.533***	-6.94
self-compassion-> parenting stress		b	-.09	.03	-.265**	-2.71
stress ->self-compassion -> parenting stress		c'	.09	.23	.316***	4.11
<b>Depression</b>						
Depression->parenting stress		c	.13	.03	.446***	4.8
Depression-> self-compassion		a	-.10	.02	-.311**	-3.15
Self-compassion -> parenting stress		b	-.48	.07	-.54***	-6.72
Depression -> self-compassion -> parenting stress		c'	.08	.02	.278***	3.46
<b>Parental burden</b>						
Parental burden ->parenting stress		c	.62	.04	.837***	15.14
Parental burden-> self-compassion		a	-.50	.07	-.605***	-7.61
self-compassion-> parenting stress		b	-.15	.06	-.166*	-2.44
Parental burden -> self-compassion -> parenting stress		c'	.54	.05	.736***	10.82
<b>Affiliate stigma</b>						
Affiliate stigma ->parenting stress		c	1.17	.04	.775***	12.13
Affiliate stigma-> self-compassion		a	-1.16	.12	-.696***	-9.58
self-compassion-> parenting stress		b	-0.13	.08	-.146 <sup>n</sup>	-1.66
Affiliate stigma -> self-compassion -> parenting stress		c'	1.02	.13	.673***	7.64
*p < .05, **p < .01, ***p < .001, n: not significant						

Results from Hayes' method was consistent with results from Barron and Kenny's approach. Self-compassion mediated the relationship between anxiety, stress, depression, parental burden, and parenting stress, but did not mediate affiliate stigma. First, the results of the regression analysis (Total =direct + indirect effect) showed that anxiety ( $b = .14$ ,  $t = 5.77$ ,  $p < .001$ ), stress ( $b = .14$ ,  $t = 5.06$ ,  $p < .001$ ), depression ( $b = .13$ ,  $t = 4.80$ ,  $p < .001$ ), and parental burden ( $b = .62$ ,  $t = 15.14$ ,  $p < .001$ ) significantly predicted parenting stress. The results also showed a statistically significant direct effect between anxiety ( $b = .09$ ,  $t = 4.17$ ;  $p > .001$ ), stress ( $b = .09$ ,  $t = 4.11$ ;  $p > .001$ ), depression ( $b = .08$ ,  $t = 3.46$ ,  $p > .001$ ), parental burden ( $b = .54$ ,  $t = 10.82$ ;  $p > .001$ ), and parenting stress). Results of the indirect effects (mediated by self-compassion), based on 5000 bootstrap samples, showed a significant *indirect relationship* between anxiety ( $a*b = .05$ , Bootstrap CI95 = .02 and .06), stress ( $a*b = .04$ , Bootstrap CI95 = .02 and .07), depression ( $a*b = .05$ , Bootstrap CI95 = .03 and .07), parental burden ( $a*b = .07$ , Bootstrap CI95 = .02 and .13), and parenting stress. The mediator, self-compassion, accounted for approximately 36%, 29%, 38%, and 11% of the total effect on parenting stress respectively. There was no statistically significant indirect effect between affiliate stigma and parenting stress ( $a*b = .15$ , Bootstrap CI95 = -.02 and .34), which shows no mediation effect. Table 5 and figure 3 graphically displays the results of the mediation analysis by Hayes method.





**Figure 3** Self-compassion partially mediates the relationship of anxiety and parenting stress

### 3.3. Social support as a moderator

In this moderation analysis by Hayes macro test model 1, social support is tested if it moderates the relationships of parenting stress and its predicting factors (anxiety, stress, depression, parental burden, and affiliate stigma). None of the interaction terms were significant, which indicates that social support does not have a significant moderating role between parenting stress and its predictive factors, which supports the null hypothesis. The moderation analysis summary is presented in Table 6.

**Table 6** Results of bootstrapping using Hayes SPSS Process Macro Test

Variable	Effect	b	SE	t	p	95% CI	
						Lower	Upper
Anxiety							
	Direct	0.09	0.02	4.17	<.001	0.13	0.32
	Indirect*	0.05	0.01			0.02	0.06
	Total	0.14	0.02	5.77	<.001	0.18	0.5
Stress							
	Direct	0.09	0.02	4.11	<.001	0.05	0.14
	Indirect*	0.04	0.01			0.02	0.07
	Total	0.14	0.03	5.06	<.001	0.05	0.14
Depression							
	Direct	0.08	0.02	3.46	<.001	0.03	0.13
	Indirect *	0.05	0.02			0.03	0.07
	Total	0.13	0.03	4.8	<.001	0.08	0.18
Parental burden							
	Direct	0.54	0.05	10.82	<.001	0.44	0.64
	Indirect*	0.07	0.03			0.02	0.13
	Total	0.62	0.04	15.14	<.001	0.54	0.7
Affiliate stigma							
	Direct	1.02	0.13	7.64	<.001	0.75	1.28
	Indirect*	0.15	0.09			-0.02	0.34

	Total	1.17	0.13	7.64	<.001	0.98	1.37
*Based on 5000 bootstrap samples							

#### 4. Discussion

This study sought to examine the levels of parenting stress, parenting burden, affiliate stigma, mental health (anxiety, stress, depression), self-compassion, coping, and social support levels among Omani mothers. As predicted, Omani mothers raising children diagnosed with ASD reported severe levels of parenting stress, parenting burden, stress, and anxiety. It also shows moderate depression, social support, self-compassion levels as well as mild affiliate stigma. However, unpredictably, the study shows that mothers mainly utilize active problem-focused coping as compared to emotion-focused or avoidant coping.

The study's findings demonstrate that Omani mothers raising children with ASD experience moderate to severe levels of parenting stress. These findings are consistent with prior claims in the literature related to ASD (Desmarais et al. 2020; Gallagher & Whiteley 2012; Huang et al., 2019 Kelly et al. 2013; Wang et al. 2013). The construct of parenting stress, however, is not examined in the Omani literature, particularly in the autism field; no study to which we can compare these findings. In the Arab scholar community, it is poorly represented. However, AL-Farsi et al. (2020) in an article that focused on these parents' quality of life posited that parents of children diagnosed with ASD reported higher levels of parenting stress in comparison to parents having children with intellectual disability (ID) or typically developing children (TDC). Also, a study conducted by Emam et al. 2023, tested the relationship between parenting stress and parents' satisfaction with life (SWL) in parents having children with disabilities across samples from three Arab countries (Oman, Saudi Arabia, Qatar), the result revealed that parents experienced high levels of parenting stress, especially in Oman and Qatar.

##### 4.1. Mental Health (stress, anxiety, depression)

This study also revealed significant severe anxiety and stress levels among mothers of children with ASD. The depression levels were moderate to severe (see Table 4). The stress, anxiety, and depression levels in this study signify mothers' mental health. These results are congruent with a study conducted in Oman by AL-Farsi et al. 2015, which examined whether there is variation in the performance of indices of stress, depression, and anxiety explored via Depression, Anxiety, and Stress Scale 21 (DASS21) among parents caring for children with autism, caregivers of children with intellectual disabilities, and caregivers of typically developing children. The study also shows that all indices of stress, depression, and anxiety were higher in parents with children compared to other caregivers in the control group. Another study conducted in Oman by AL Shekaili and his colleagues (2019) attempted to understand the prevalence and risk factors among Omani parents raising children with ASD and revealed that the depression rate was at 71.3% with unemployment and being the sole parent/caregiver in the family where both significant correlates of depressive symptoms. The same result was reported by parents raising children diagnosed with ASD in other Arab countries, namely Saudia and Kuwait (Almansour et al. 2013, Fido & AL Saad 2013).

Worldwide, several studies have supported this study's findings about the mental health of parents raising children with ASD (Hodge et al. 2013; Tomeny 2017). For instance, in a national survey conducted by Zaslofsky and colleagues (2013), the researchers tested the stress level and mental health of mothers with children with autism. After accounting for the child's, mothers', and family characteristics, it was determined that mothers of children with ASD were at greater risk for poor mental health and high stress levels. This study also corroborates with other studies carried out in other populations, which determined that caring for children diagnosed with ASD impacts the mental health of parents (Alibekova et al. 2022). Therefore, there are strong grounds to contemplate mechanisms to help such vulnerable mothers.

However, while mothers in this study reported extremely severe anxiety it does not appear that this affected depression levels, as they remained moderate. This can be explained by that mothers may have coped with stress by using coping skills and receiving social support from a significant other, family, or friend, but they sometimes find it difficult to stop worrying due to the intense, chronic, repetitive, and daily responsibilities while performing others roles, at work for instance.

##### 4.2. Parental burden

The study also indicates that Omani mothers raising children with ASD endure severe parental burden levels. This finding is consistent with the literature related to ASD that explores the parental burden and its impact on parents

having children diagnosed with ASD (Singh & Ghosh & Nandi, 2017 Wang et al., 2018). For instance, Picardi et al. 2018, tested parental burden among parents of 359 children/adolescents with ASD compared to parents of age-matched patients with Down syndrome (N=145) and Type 1 diabetes mellitus (N=155). They confirmed that parents of children with ASD carry a huge caregiving burden in comparison to their counterparties. Similarly, Bozkurt et al. 2019 conducted a descriptive cross-sectional study to examine parental burden with parents of 131 children with ASD who were enrolled in a private education practice center. They also determined that parents of children with ASD had a higher burden of care. There is consonance in the literature that parental burden is a significant concept that negatively affects parents of children having ASD (AL Nazly 2016, Rayan & Ahmed 2016). This concept carries a huge relevance to ASD because of the ASD nature, chronicity, and symptomatology. The higher levels of parental burden in this sample are alarming and need to be dealt with.

#### 4.3. Affiliate stigma

This is the first study in Oman to examine the affiliate stigma among Omani mothers raising children diagnosed with ASD. The study indicates that Omani mothers experience moderate levels of affiliate stigma. This indicates that mothers in this sample moderately internalize stigmatization from the public. For instance, the majority of Omani mothers (90%) reported that they agree (56%) or strongly agree (34%) with item #9 on the stigma scale which states that “people's attitudes towards me are negative when I am with my child who has autism”. Also, a significant proportion of them (76%) strongly agreed with item #3 on the scale which states that “Other people would discriminate against me if I was with my child who has autism”. These findings regarding affiliate stigma are also consistent with the literature related to ASD (Mitter et al. 2019; Patra& Patro 2019; Salleh et al. 2020;). Yet, it contradicts the result of Western literature which reported lower levels of affiliate stigma (Recio et al., 2020; Werner & Shulman, 2015). The difference may result from different cultural contexts and social representations of disability. Western culture is characterized by individualism and analytical thinking (Nisbett et al., 2001). However, the Asian literature has a culture similar to the Omani culture that emphasizes social evaluation, the evaluation of others, and a strong sense of social and family responsibility (Ma et al. 2023; Mitter et al. 2019; Patra& Patro 2019; Salleh et al.2020; Stalder, 1996) reported high levels of affiliate stigma in the autism context among parents (Ma et al. 2023, Mak & Cheung, 2008; Mak & Kwok, 2010).

This discrepancy raises questions about what may act as a maternal stress buffer that prevents mothers in this sample from internalizing higher levels of affiliate stigma as described in the literature, particularly in Asian literature. One possible explanation for this discrepancy may be the different characteristics and range of participants. The current study focuses primarily on mothers of children diagnosed with autism. Previous research has mainly focused on parents and caregivers (e.g., grandparents); also, on both children and adolescents with autism as well as children with special needs, and not exclusively on children with autism. Another explanation may be that the majority of respondents (77%) were between the ages of 35 and 55, in contrast to only 23% of younger mothers. Younger parents may be more inclined to seek the approval of others and uphold a favorable reputation, while older ones may be less concerned with how others perceive them (Luo, 2017). These findings may also underlie the increasing individualism that accompanies socioeconomic development globally, especially during and after the COVID- 19 pandemic (Pilotii et al. 2023). Thus, it may reflect that Omani society is undergoing a transition in its traditional collective ethos to become an individualistic society (cultural disposition) due to the sustainable, knowledge-driven, and market-based economy that Oman witnessed recently (Rayan et al. 2014). Thus, norms and public reactions no longer play a significant role in shaping the behavior and thinking of individuals. Moreover, other factors, such as coping strategies and social support from a significant other, may also play a role.

These mothers internalize stigmatization feelings, due to their affiliation with a child having autism. This prejudice and discrimination may lead to feelings of hopelessness and shame in those struggling to cope with their situation as mothers of a child with autism, creating a serious barrier to rehabilitation and a reluctance to seek help or treatment for these children (Zhuo et al. 2018). This is one of the significant findings of this study, which needs deep exploration and interventions to alleviate its impact on mothers and potentially their children. Additionally, the experience of affiliated stigma by caregivers is relatively understudied in Omani society, despite contributing to a range of poor outcomes and having an overarching impact on their mental health as reported by literature (Al-Maskri 2018, Kim et al, 2022; Turnock et al. 2022).

#### 4.4. Self-compassion

This is the first time that the concept of self-compassion has been introduced and studied in autism research in the Omani and Arab scholar communities related to ASD. Few studies in the neighboring countries have examined its prevalence and impact in other various populations such as adolescents (Hammad et al. 2023), pregnant women (Chasson et al. 2022), and women with breast cancer (Shams EL-din 2021). So, no study to compare the results to the Omani or Arabic literature. However, the Western literature indicates that parents having children diagnosed with ASD

may experience a low level of self-compassion, which contradicts this study's findings. A possible explanation for the moderate level of self-compassion in this sample and not a lower level as hypothesized may be that the sample is primarily composed of women. In Almazan et al. (2019), women exhibited more compassion than men as evidenced by nurturing, kindness, gentleness, and emotional warmth. It is noteworthy, however, that Phillips and Ferguson (2013) found no gender differences with regard to self-compassion.

There is also the possibility of a sociocultural explanation. Compassion for oneself, others, and the surrounding environment are influenced partly by sociocultural aspects of life (Abdulaziz et al. 2020). Societal and cultural norms largely influence individual experiences that shape their perspectives toward self, others, and situations (Alshehrye et al., 2019). In Oman, a quick industrialization leap occurs due to the expansion of urbanization (Al-Badi, A., & Al-Mubarak, 2019). Accordingly, this phenomenon may lead to social advancement, which may have the potential to provide further opportunities for self-care, self-development, and growth (Abdulaziz et al. 2020); hence, a significant level (moderate or high level) of self-compassion is anticipated. However, this premise requires further investigation in future studies. In general, a moderate level of self-compassion indicates that further intervention is needed. In order to alleviate the negative outcomes associated with raising children with ASD spectrum disorders, this area needs to be strengthened so that mothers possess a greater sense of self-compassion.

#### **4.5. Social support**

The findings of this study also revealed that Omani mothers experience moderate levels of social support. In a study conducted in Oman, the researchers found that seeking social support is the most frequently utilized strategy to cope with ASD among Omani parents (Al Busaidi et al. 2022). Similar findings have been reported by researchers in Saudi Arabia and China (Khusainfan & El keshky 2021; Ebrahim and Alothman, 2021 Lei & Kanotr 2021). These findings also corroborate with literature on ASD (Ekas et al, 2010, Johnson et al. 2011). Due to the maladaptive or challenging behavioral problems of children with ASD, mothers of these children have less leisure time and social activities, which aggravates the parents' parenting stress (Heiman and Berger, 2008). Social support can alleviate the burden of mothers who take care of children with ASD and consequently mitigate parenting stress (Picardi et al. 2018). Of the three sources of support, mothers reported the lowest perceived support from friends, followed by families, and significant others. This finding concurs with that of Ravindran and Myers (2012) and Singh and colleagues (2017), who found that Indian caregivers of children with ASD were less likely to cite friends and support groups as sources of support than their Western counterparts. An analysis conducted by Divan et al. (2012) revealed that mothers had withdrawn from society, cut off all friendships, or become socially isolated or homebound after their children were born. Similar findings were also found among Iranian parents of children with ASD (McConkey and Samadi 2013).

These results are in contrast to mothers in the West, who tend to identify providers, including other parents of children with ASD, as sources of support (Mackintosh et al. 2006; Boyd 2002). There are two possible reasons why mothers tend to rate low on perceived support from their friends. The first reason could be perceived affiliate stigma from having a child with ASD, and the second could be cultural norms, which do not support sharing worries beyond one's immediate network. In Oman, disability in any form is stigmatizing and may result in 'losing face,' being 'criticized,' 'being disruptive to group harmony,' or 'bringing shame to the family.' Therefore, disclosing one's child's condition beyond one's immediate family and seeking social support for the same may not be an option for these mothers. Hence dependence on family or significant others is reportedly higher.

A moderate level of social support may explain the increased level of parenting stress among mothers. It is possible that mothers seek social support primarily from their significant others and may be reluctant to extend the cycle of social support to their families, friends, or even community institutions. Therefore, the findings of this study emphasize the importance of cultivating social support, particularly from family and friends, in order to mitigate parental stress.

#### **4.6. Predictors of parenting stress**

The second aim of this study is to test whether stress, anxiety, depression, parental burden, and affiliate stigma predict parenting stress. The current study demonstrated that parental burden and affiliate stigma significantly predicted parenting stress among Omani mothers raising children with ASD regardless of their age, marital status, and educational level. This finding implies that as the level of parental burden increases, so does the perceived parenting stress. This result aligns with existing literature that highlights the significant impact of the parental burden on parenting stress (Patel 2022; Picardi 2018; Treyvaud et al. 2011). Likewise, the variable "affiliate stigma" showed a significant and positive relationship with parenting stress. This suggests that mothers who experienced higher levels of affiliate stigma related to their parenting role also reported higher levels of parenting stress. Prior literature has also shown that affiliate stigma can be a significant stressor for parents, especially those who have children with ASD (Chu et al. 2020; Rebecca et al. 2018, Salleh et al. 2022). The internalization of stigma by association predicts greater psychological

distress and may subsequently decrease well-being and increase parenting stress among parents (Torbet et al. 2019). Surprisingly, anxiety, stress, and depression were found not to predict parenting stress. The small sample size in relation to the number of independent variables could contribute to the non-significance of anxiety, depression, stress, and maternal characteristics. This suggests that the levels of anxiety, stress, and depression experienced by parents in the study did not significantly influence their perceived parenting stress.

The findings regarding mental health corroborate with the findings from a study conducted by Cheung and colleagues (2019) in which they found that parents' mental health did not explain the variability of parenting stress. In contrast, the findings regarding mental health in this study are also inconsistent with some previous studies that have found associations between parental mental health issues and parenting stress. Prior literature has shown that parental anxiety, stress, and depression can contribute to higher levels of parenting stress and decreased parenting satisfaction (Leigh, & Milgrom, 2008; Rezendes, & Scarpa, 2011). However, it's worth noting that the strength of these associations may vary across different populations and contexts. In addition, mothers may use various coping stress and social support to reduce their stress and potentially their depression. This also indicates that parenting stress is a distinct domain of stress (role-specific) and that raising a child with ASD is a multifaceted experience due to its chronicity and its complex nature. The control variables, including education, age, marital status, and employment, did not have significant relationships with parenting stress. This means that these variables did not exert a significant influence on the perceived parenting stress in the sample. The lack of significant relationships for these variables aligns with some prior literature (Dukmak et al. 2021; Lee & Chiang 2017; Tomeny 2017); while other studies may have found different associations depending on the specific cultural context (Camisasca et al. 2014, Epstein et al. 2008).

In summary, the findings from this multiple linear regression analysis provide insights into the predictor factors of parenting stress. The significant positive associations between parenting stress and variables like parental burden and stigma are consistent with prior literature (Cheung et al. 2018; Dehnavi et al. 2011). However, the non-significant relationships between parenting stress and mental health variables like anxiety, stress, and depression may differ from some prior claims in the literature. It's important to acknowledge that this study is just one piece of the broader research landscape on parenting stress, and findings may vary across different populations and research designs. Researchers should consider these factors when interpreting and applying these findings to real-world contexts. Further research is needed to explore the complex and multifaceted nature of parenting stress and its determinants fully.

#### **4.7. Self-compassion as a partial mediator**

The third aim of this study is to examine the moderation role of self-compassion. The findings from the mediation analyses presented in Table 4.11 and 4.12 shed light on the role of self-compassion in the context of parenting stress and its associations with different predictor variables. The result shows that self-compassion mediates the relationship between anxiety, stress, depression, parental burden, and parenting stress, but not affiliate stigma. This implies that mothers who exhibit higher levels of self-compassion tend to experience lower levels of parenting stress, even when they face challenges related to anxieties, stress, depression, or parental burden. Self-compassion seems to buffer the impact of these factors on parenting stress to some extent. Each of the predictor variables (anxieties, stress, depression, parental burden) exhibits a significant direct relationship with parenting stress. This means that these factors have an independent association with higher levels of parenting stress, indicating that they are important contributors to the stress experienced by parents. However, it is essential to note that even after considering self-compassion, the predictor variables still retain a significant association with parenting stress, indicating that there are additional factors beyond self-compassion that contribute to parenting stress. There is a scarcity of self-compassion as a mediator between these variables and parenting stress in the ASD context, so there were no studies to compare with. Self-compassion, also, doesn't mediate the relationship between affiliate stigma and parenting stress, which indicates that the relationship between affiliate stigma and parenting stress is not affected by the extent to which these mothers are compassionate and kind to themselves. There is a dearth of information about self-compassion as a mediator between affiliate stigma and parenting stress. Therefore, there is no literature to compare these results with. In conclusion, the results underscore the importance of self-compassion as a psychological resource that can help parents cope with stress. Being kind and understanding toward oneself in the face of challenges may serve as a protective factor against the negative effects of various stressors commonly experienced by these mothers.

#### **4.8. Social support as a moderator**

The last aim of this study was to examine the moderation role of social support between the relationship of parenting stress and its predictors. The findings from the moderation analysis provided insights into the role of social support in the context of parenting stress. Unpredictably, social support has no moderation role in any of the independent variables (stress, anxiety, depression, parental burden, and affiliate stigma) and parenting stress. There was no significant interaction between these variables and parenting stress. These findings contradict the literature which suggested that

social support can act as a buffer against parenting stress for individuals with varying levels of parental burden or with poor mental health parents (Al Busaidi et al. 2022; Khusainfan & El keshky 2021; Ebrahim and Alothman, 2021 Lei & Kanotr 2021). For instance, when parents have higher levels of social support, it may help alleviate the negative impact of low parental burden on parenting stress (Lei & Kanotr 2021). This study, however, indicates that the presence or absence of social support may not significantly alter the impact of stress, anxiety, depression, parental burden, and affiliate stigma on parenting stress. Other factors may have a more prominent influence on parenting stress in the presence of these factors. It is also possible that social support could be a mediator not a moderator or even a predictor in this relationship. Further research, therefore, is needed to explore the mediating role of social support.

The non-significant moderating role of social support between mental health, parental burden, affiliate stigma, and parenting stress stood out as an important finding. There are three plausible explanations. One explanation may be the relatively small sample size, which could lead to the inability to detect a significant relationship. The other potential explanation may be measurement error. Although the measure of social support in this study had well-established reliability and validity, it may be measuring the wrong aspect of social support. We selected interpersonal support as the dimension of social support for this study. The mother's report of social support reflected moderate to high levels of social support from her network. Although the support of significant others, family members, and friends is important for these families, we did not measure institutional social support such as that provided by medical and social organizations. In Oman, the system of services is focused on the autistic child, not the family; services for these families from organizations are not the same type of social support as the interpersonal support that was assessed in the current study. Future studies need to consider the assessment of organizational or institutional support. For this purpose, it may also be beneficial to use an instrument that incorporates institutional support.

The study findings also may call for forming system-level collaborative implications between the two organizations (Ministry of Health and Ministry of Social Development) to bridge the gap between the services provided to individuals diagnosed with ASD and their families. Literature (Huang et al. 2019; Ji et al. 2014) indicated that the interaction between children with ASD and their families is a significant factor in improving their quality of life (QoL). Therefore, the collaborative effort in providing services between these organizations may provide individuals with ASD and their families with a healthier and more conducive environment to live and interact. Study results documented high levels of parental burden and parenting stress that were not moderated by interpersonal social support. Given this result, we speculate that although the service agencies in Oman for the child with autism may be serving the child well, there is a gap of services for serving the families. Services are needed to help reduce parenting burden and parental stress. This need argues for a needed collaboration between the Ministry of Health and the Ministry of Social Development in Oman

#### **4.9. Implications of the study related to the Omani system of health and social welfare.**

The ASD rate is substantially increasing in Oman (AL-Mamari et al. 2019). In parallel with this increment, Oman's health and social welfare systems also advance the services provided to those children. For instance, in 2017, the country launched a national screening program, requiring all children to be screened for ASD at 18 months when they receive their compulsory measles-mumps-rubella vaccines (AL-Mamari et al. 2017). Clinicians then refer children to diagnostic centers and services as needed. Another vast step was done by the Ministry of Social Development when it established the Oman National Center for ASD(ONCA). The center, the first of its type in Oman, offers top-notch services for children with ASD in need of rehabilitation and therapy. Using the most recent programs to facilitate social inclusion and independence, it is intended to provide cutting-edge rehabilitation and therapy services for individuals with ASD of all ages, from toddlerhood to adulthood. However, this is not the case with families suffering from the hardship of ASD along with their children in Oman. The Ministry of Health provided early screening programs to detect cases of ASD, diagnostics centers, and trained professionals who provided services solely to these children. To the best of my knowledge, there are no programs or resources created to support mothers and other family members. Likewise, the Ministry of Social Development provided children with rehabilitation services by supervising various governmental and private ASD centers. The Oman ASD Association made a few successful attempts toward supporting mothers such as providing educational workshops and creating the first support group for mothers. However, these few services were scattered with no collaboration between these three institutions. Additionally, the services were mainly in the capital Muscat.

ASDis a unique condition that may affect not only the child but all family members including parents and siblings. This is what this study indicates. Omani mothers, in this sample, endure severe parenting stress as a result of caring for a child diagnosed with ASD. Though the study implies that mothers' mental health (stress, anxiety, and depression) could not predict their parenting stress levels, it also shows that mothers sustain extremely severe anxiety and moderate levels of stress and depression. Many of them were burdened with the responsibilities of caring for these children. One can imagine how these alarming signs may affect their abilities to care for their children and the quality of life of both.

In this matter, we argue that one important point to consider when investing budget and resources for children with ASD is to simultaneously invest budget and resources in supporting their families. The Omani system fails to provide mothers with the necessary services to support them in their journey toward adaptation, empowerment, healthy growth, resilience, and improved quality of life (AL Farsi et al. 2021, AL Maskri et al. 2018).

Omani system fails to deal with children with ASD and their mothers as a unit (AL Maskri et al. 2018, AL-Akhzemi and Huang 2020). Recognizing that the chronic state of ASD mandates that mothers may play a key role in teaching, rehabilitating, treating, and adapting to their children's condition. Literature in the ASD field constantly discussed and proved that healthy interactions between mothers and their children with ASD lead to better parenting outcomes and improved quality of life for both (Parlade et al. 2020; Rozenblatt-Perkal & Zaidman-Zait 2020). We, therefore, urge the Omani Ministry of Health and the Ministry of social development to bridge the gap between the services they provide to children diagnosed with ASD and their mothers to be more family-focused instead of investing huge amounts of money and services to children, while ignoring the most important factor in this child health, his own environment, and surroundings (family, particularly mothers). The Omani system (health and social welfare fields) related to ASD should be shifted to a more individualized and family-focused healthcare system including simultaneously both mothers and their children. In addition, one significant factor that predicts parenting stress is stigma. While awareness of ASD has improved in Oman, the stigma surrounding it still lingers. This is one of the important findings of this study. Omani mothers internalize stigmatization from the public. This predictor should be deeply investigated in the Omani context. Oman is a community with norms and traditions. As it is reported in the literature, challenging behaviors in public by children with ASD cause stigmatization and embarrassment to mothers. A genuine effort is needed from the government and its institutions to establish a social platform and media and campaigns that educate and enhances public awareness and challenge society's stereotypical thought about ASD and about supporting mothers with children having ASD in public. The government also should encourage interventions and supporting programs to compact stigma in the community. Government through its various institutions including the Ministry of Health and the Ministry of social welfare should create cultural and systemic shifts that foster inclusivity and recognize neurodiversity.

### *Limitations*

The study design, which is a cross-sectional multiple linear regression analysis, cannot establish causality. The identified relationships between variables do not indicate the direction of influence. Longitudinal or experimental research designs would be necessary to determine causal relationships. Moreover, the study's findings may not be generalizable to all populations or cultural contexts. The sample used in the analysis might not fully represent the diversity of parents and families, limiting the external validity of the results. The data used in the analysis likely relies on self-reported measures, which can be influenced by social desirability bias or memory recall issues. Participants may underreport or overreport certain factors, leading to inaccuracies in the data. The multiple linear regression model is based on the variables included in the analysis. Other relevant factors that were not measured or considered may also influence parenting stress, and their exclusion can affect the model's explanatory power. Measurement errors in the variables used in the analysis can affect the accuracy of the results. The reliability and validity of the measurement tools utilized should be considered. If the study utilized a large and diverse sample size, it enhances the study's statistical power and strengthens the reliability of the findings. Overall, while the study has its limitations, its statistical rigor and practical implications are strengths that can contribute to the knowledge base on parenting stress and inform clinical practice and future research.

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## **5. Conclusion**

Parenting stress in the ASD context is a significant and multifaceted aspect of family life that can have a profound impact on both parents and children. This study examined parenting stress predictors in the ASD field. In contrast to mental health, parental burden, and stigma were significant predictors of parenting stress. The findings highlight the importance of addressing parental burden and stigma in supporting parents and promoting family well-being. We also investigated the mediation role of self-compassion, and the moderating roles of coping and social support between mental health, parenting burden, affiliate stigma, and parenting stress. The findings of the mediation and moderation analysis support the enhancement of mothers' self-compassion and the utilization of adaptive coping strategies. Parental support programs that focus on coping strategies, resources, and education may be beneficial for parents. Mental health interventions targeting parental stress should be considered, even though the study did not demonstrate that these constructs predict parenting stress. Despite the study's limitations, such as its cross-sectional design and reliance on self-reported measures, its statistical rigor and practical implications contribute to the existing literature on parenting stress related to autism. The impact of parenting stress on parents' well-being and family dynamics should be considered by clinicians and mental health professionals. The integration of evidence-based interventions, such as cognitive-behavioral therapy, mindfulness-based practices, and parent-child interaction therapy, can help parents

manage stress and enhance their coping skills. These findings also highlight the need for further research, including longitudinal studies, qualitative investigations, and research with diverse populations, to better understand parenting stress and to develop more targeted and effective interventions. Building on these findings, future research can employ longitudinal designs and consider other relevant factors to further enhance our understanding of the complex dynamics influencing parental well-being and stress management. Ultimately, a deeper comprehension of these relationships will contribute to the development of more effective interventions to support and promote the well-being of parents in their crucial role as caregivers.

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## Compliance with ethical standards

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### *Disclosure of conflict of interest*

No conflict of interest to be disclosed.

### *Statement of ethical approval*

The authors are accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved. The study was conducted in accordance with the Declaration of Helsinki (as revised in 2013). The study was approved by Ministry of Health's Research and Ethical Review & approve Committee (RERAC) at Sultanate of Oman. The Unique Identification Code (UIC) of the study is 25819.

### *Statement of informed consent*

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

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