

Status and Correlates of Caring Behaviors Among Parents of Children with Chronic Respiratory Diseases: The context of post-COVID-19 era

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Abstract: This study aimed to assess the sociodemographic correlates of caring behaviors among parents of children with respiratory diseases, and their sources of information post COVID—19 era. A descriptive, cross-sectional design used. A convenience sample of 363 parents using self-administered questionnaire completed by parents of children with respiratory diseases. Data collected in relation to sources of information about caring of child with respiratory disease and health related practices responses. The analysis showed that the highest mean score was for trusting in the specialist (M = 3.9, SD = .040) followed by the nurses and pharmacists with mean scores of 3.15 (SD = 1.05) and 3.04 (SD = 1.06). Also, the means score for health practices of parents was 19.26 (SD = 4.68) suggesting a moderate to high level of positive caring behaviors among parents. Caring behaviors have significant and negative association with number of children ($r = -.22, p < .001$), and a significant and negative association detected between caring behaviors and number of children below the age of 18 years ($r = -.25, p < .001$). The analysis showed that male and female parents were significantly different in relation to over-reactivity domain ($t = 2.41, p = .016$), and in the total score of caring behaviors ($t = 2.49, p = .013$). There is a need to enhance proposer health education for parents of children with respiratory diseases. Parents also should be encouraged to use the formal and scientific sources of information.

Keywords: Caring Behaviors; Source of information; Respiratory disease; Children.

Introduction

On March 11, 2020, the World Health Organization (WHO) declared the novel corona virus (COVID-19) outbreak as global pandemic. COVID-19, known for its impact on the respiratory system and high contagion rate [1] forced countries worldwide to impose various measures to mitigate its spread causing various disruption of human's lives [2-3]. Despite the necessity of such measures to decrease death rates [4], the measures contributed to disruption in people's lives. Studies highlighted their negative and long-term impact of restriction measures on health behaviors on both parents and their children leading to physical and mental disturbances [5-6]. On the other hand, other studies have highlighted the positive impact of increased health awareness, leading to more proactive health behaviors such as regular handwashing, mask-wearing, and social distancing. [7]. However, the adoption of such healthy behaviors to avoid COVID-19 was much less observed among children and adolescents compared to younger adults [8]. This may indicate the role of family caregivers, namely parents as the primary ones, on enhancing healthy behaviors among their children. Family behaviors and dynamics reported as significant key factor in overall health of the family [9]. Therefore, parents, as primary

caregivers, need to recognize their children's needs, be mindful of their caregiving practices, and carefully select sources of information to ensure appropriate care. This suggests that the well-being of parents caring for children with respiratory diseases could impact their own health, potentially leading to negative outcomes in their children's care. Data on the prevalence of chronic respiratory diseases (RD) among children in Jordan is scarce; however, one study reported that the prevalence of asthma among Jordanian school children in Amman, the capital city, is approximately 3% [10]. Another study suggested that there is a need to reorganize how to follow-up with patients suffering RD [11]. The population's experience with COVID-19, including the infodemic and public panic, drove many people to adopt protective health behaviors. In particular, parents of children with respiratory diseases, among the most vulnerable groups, have been especially cautious to prevent COVID-19 infection. These behaviors have become part of their daily routines and have influenced their attitudes toward respiratory infections, shaping their caregiving and protective practices. Studies investigating sources of information used by parents caring for their children are well-documented in the literature. Various forms and sources of information have been reported. For example, Baumann and colleagues [12] found that parents

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of children with health problems frequently use digital media to search for health information, in addition to consulting personal contacts such as pediatricians and family members. The rise of the internet and the availability of information through websites, media, and other sources highlight the need for validation to prevent misinformation and misconceptions among parents.

The literature provides evidence that health practices have changed due to COVID-19, affecting healthcare professionals, and patients in the Arab region [13-15]. However, the health practices of caregivers, including parents of children with chronic RD, have not received sufficient attention from researchers. Years after the pandemic, it is important to assess the sustainability of these health behaviors post-pandemic. As parents are considered the primary care giver to their children, their behaviors and knowledge are assumed to influence their caring behaviors toward their children. Adopting health behaviors over risk behaviors is essential for parents of children with respiratory health problems. This study emphasizes the importance of this issue due to its direct impact on children's health. It aims to enhance understanding of how health behaviors have been sustained in the post-COVID-19 era and to assist decision-makers in identifying these behaviors early on, thereby, developing intervention policies and guidelines to promote and sustain positive behaviors while mitigating negative ones. The *purpose* of this study was to examine the sociodemographic correlates of caring behaviors among parents of children with chronic respiratory diseases, and to identify their sources of information.

The research questions were:

What is the status of caring behaviors among parents of children with chronic respiratory diseases in Jordan post COVID—19 era?

What are the sources of information for parents of children with chronic respiratory diseases in Jordan post COVID—19 era?

What is the relationship between selected socio-demographic characteristics and caring behaviors among parents of children with chronic respiratory diseases in Jordan post COVID—19 era?

Methods

Design

This study used a descriptive, cross-sectional design. Data was collected using online and in person self-administered questionnaires from parents of children with chronic respiratory diseases in Jordan.

Sample and Setting

Data was collected from healthcare settings and all public health facilities in Jordan, in particular, the institutions with pulmonary units. In addition, social media platforms were used to recruit sample. Convenience sampling technique was used utilizing the online and in person format of data collection. Inclusion criteria: 1) Parents who have children less than 18 years old with chronic respiratory diseases confirmed by the medical records of the child that have been check after getting the initial approval of the parents. 2) acting as primary caregivers for their children, 3) able to read and write in Arabic, 4) able to use the electronic devices to fill out the survey. Exclusion criteria: Parents of children with physical and neurocognitive disabilities due to the possible effect that parents of such children will have more burden and concerns to disabilities rather than physical problem.

Data collection procedure

Ethical approval from the Ministry of Health (#4368/2024) was obtained prior data collection. Additionally, a letter from the Ministry of Health was sent to the centers where the survey was conducted. Before starting data collection, a pilot study was

conducted with 10 parents. Facilitators were assigned to cover the targeted centers to invite parents of children with respiratory problems to participate in the study. The facilitator approached every single parent visiting the public centers for medical care for their child with respiratory problem. Then, they explained the purpose and the significance of the study, ensured the voluntary of participation, the privacy, and confidentiality of participation. Participants had all their questions answered prior signing the consent form. Parents who agreed to participate were asked to sign a consent form, which included purpose, significance and all the above-mentioned ethical considerations. The consent form also highlighted their right to accept or refuse participation at any point during the study, and they were ensured that the quality of care would be maintained at the optimum level regardless of their decision. For those who have access to electronic sources such as smart phone or else were provided with link of the survey where the consent in electronic. The electronic form requires that the participants sign with "agree" to be able to get to the survey. After signing the consent form, parents were provided with the questionnaire, which included a demographic sheet describing the population and their characteristics, as well as different questions which measured their practices. For those who expressed their inability to read or write, the research assistant took the responsibility to read the questions and the responses confirmed by a witness whom either a nurse from the center or an adult companion able to read and write. The time required to fill the form was also provided. The data was saved using a digital tool.

Measurements

Arabic version of the following tool was used to measure the variables of the study. The original non-Arabic tools had been translated into Arabic language using the WHO guidelines for tool adaptation and translation. The tools were:

Caring behaviors were measured using the Parenting Scale tool [17]. The scale is formed of 30 items that have a score of a 7-point scale, with low scores indicating good parenting and high scores indicating dysfunctional parenting. The scale has three main subscales: Laxness (LX), Over-reactivity (OR), and Hostility (HS), and there are some items that have no factor. This scale has been previously used to measure the discipline practices of parents of middle school children. This scale has been used previously among parents and proved its validity [17]. This scale has been adapted to parents of children with respiratory problems in which questions have been reformed to correspond with questions related to health of children with respiratory problems. The tool has good internal consistency with Cronbach's alpha of 0.78 (Laxness: 0.83, Over-reactivity: 0.82, Hostility: 0.70).

Source of information tool was collected using an authors' developed format. Few questions were asked about the source of information, the validity of the source of information, the preference of using these sources of information and its influence on the impact on their practices. The first section asks parents to indicate whether they use specific sources of information. If they answer yes, they can proceed to the second section, where they will assess the reliability of these sources on a Likert scale ranging from "not reliable" (0) to "very reliable" (3). The questions in this section allow parents to choose more than one answer. The scale was tested for reliability and found to have good reliability, with a Cronbach's alpha of .78. In addition, a socio-demographic profile was developed, one sheet for the parent and one for the child. Information was about the social, cultural and demographic information such as sex, age, marital status, number of children, income, working status, and health status.

Ethical consideration

IRB from the MOH in Jordan was obtained prior commencing the research to ensure that "the research is conducted ethically, and the rights and welfare of the participants are protected". A consent was obtained from all the participants before filling out the survey. All ethical right maintained including privacy, confidentiality, anonymity, and voluntary participation. Participants was also informed about their rights to accept or refuse participation at any point of the study without any effect on the quality of care they receive.

Results

Demographics characteristics

A total of 363 parents agreed to participate in the study and completed the online survey. The analysis revealed that 83.2% (n = 302) of the parents were female, while 16.8% (n = 61) were male (see Table 1). The mean age of the parents was 36.1 years (SD = 8.6), with ages ranging from 19 to 56 years and a median age of 36 years (50%, n = 182). In terms of geographic distribution, 58.7% (n = 213) identified Central District as their place of living, 24.2% (n = 88) Northern, and 16.8% (n = 61) the Southern District. The majority of the parents were still married, accounting for 87.6% (n = 318), while those divorced represented 8.5% (n = 31), and widowed were the least with 3.9% (n = 14). Regarding income, 18.5% (n = 67) reported themselves being at low level of income, 67.5% (n = 245) medium income, and 14.0% (n = 51) had a high income. Regarding their educational level, 1.1% (n = 4) reported that they can't read or write, 35.5% (n = 129) had high school or less education, 26.7% (n = 97) had a diploma, and 36.6% (n = 133) had university-level education. Regarding employment in the health sector, 75.5% (n = 274) of the parents did not work in the health sector, while 24.5% (n = 89) were health professionals.

Also, the analysis showed that the mean total number of children was 3.88 (SD= 1.83) ranging from 1-10 children with 50% (n= 181) had 4 children or more. Also, the parents reported that the mean number of children below the age of 18 years was 3.04 (SD= 1.36) ranging from 1-7 with 50% (n= 181) of the parents had 3 children or more. In relation to demographics of the children, the analysis showed that the mean age of the children was 6.9 years (SD = 4.3), with a median age of 5.9 years, ranging from 1 to 17 years. Of the children, 44.4% were females (n = 161) and 55.6% were males (n = 202).

Health-Related Factors

The analysis of health-related factors, showed that the mean period of child's diagnosis was 30.6 months (SD = 37.5), ranging from 1.0 to 192.0 months.

Table 1: Demographic characteristics of parents and children with chronic respiratory diseases (N=363)

Variable	n	%	
Parent's Demographics			
Sex	Female	302	83.2
	Male	61	16.8
Geographic Distribution	Central District	213	58.7
	Northern District	88	24.2
	Southern District	61	16.8
Marital Status	Married	318	87.6
	Divorced	31	8.5
	Widow	14	3.9
Income	Low	67	18.5
	Medium	245	67.5
	High	51	14.0

# children < 18 years	One child	45	12.4
	2-4 children	259	71.3
	5-7 children	54	14.9
Level of Education	Can't Read or Write	4	1.1
	High School or Less	129	35.5
	Diploma	97	26.7
	University Level	133	36.6
Child's demographics			
Sex of Child	Female	161	44.4
	Male	202	55.6
Parent work as Health Professional	No	274	75.5
	Yes	89	24.5

Fifty percent of the participants (n = 182) reported that their child had been infected with COVID-19 during the pandemic. Regular medication use was reported for 50% (n=182) of the children, and 6.1% (n = 22) suffered from non-respiratory diseases. The mean of number of times that parents visited the clinic for was 1.6 times per year (SD = 3.4) ranging from 0 to 10 visits. The mean number of emergency room visits per year was 1.8 (SD = 3.1), ranging from 0 to 12 visits.

Variables of the study

Trust and Reliance on Sources of Information

The analysis (see table 2) showed that the highest mean score was for trusting in the specialist (M = 3.9, SD = .040) followed by the nurses and pharmacists with mean scores of 3.15 (SD = 1.05) and 3.04 (SD = 1.06); respectively.

This indicates that parents of children with respiratory problems rely more on and trust their healthcare providers. However, schools (including school nurses and doctors) were the least utilized source of information regarding their children's health, with 52.6% (n = 191) of parents not using this resource. Among those who did utilize schools, almost half considered them to be moderately to highly trustworthy and reliable (49.3%, n = 104). On the other hand, influencers and social media celebrities were the second most reported unused source (50.7%, n = 184), and they were viewed as unreliable or weakly reliable by 30.6% (n = 108) of respondents. One of the most notable findings is that 46.3% (n = 168) of parents indicated they do not use the official website of the Ministry of Health, which is assumed to be one of the most reliable sources of information.

Caring behaviors

Regarding parents' caring behaviors used with their children suffering from respiratory problems, the analysis revealed a mean score of 19.26 (SD = 4.68), with scores ranging from 2.0 to 26.0. Furthermore, 50.0% (Md) of the parents had a score of 20.0 or above. Using the interquartile range, the analysis indicated that 50.0% of parents had scores between 16.0 (P₂₅) and 22.0 (P₇₅). Given that the expected score on the scale ranges from 0 to 27.0, these results suggest a moderate to high level of positive caring behaviors among parents.

The item analysis showed that the highest two positive behaviors were "teaching health and hygiene" (M = 2.77, SD = .71) and "I pay attention to symptoms of illness early" (M = 2.50, SD = .71). While the lowest that tend to be more likely negative health behaviors were "Wear a mask if he goes to the market or mall" (M = 1.11, SD = 1.01) and "Isolate the child siblings from him if they get sick" (M = 1.76, SD = 0.96).

Bivariate analysis

Analysis has been conducted to test the correlation and differences in caring aspects in relation to several sociodemographic factors including, age of parents, age of

children, number of children, working status, type of work of parents, and family history of respiratory disease. To examine the relationship between selected child characteristics and caring behaviors, Pearson coefficient (*r*) was used. The analysis (Table 4) showed that parents' caring behaviors have significant and negative association with number of children ($r = -.22$, $p < .001$) indicating that parent have higher scores on caring behaviors when they have more children.

Also, a significant and negative association detected between caring behaviors and number of children below the age of 18 ($r = -.25$, $p < .001$), while no significant association between caring behaviors with age of child and the period of being diagnosed ($p > .05$).

Regarding domains of caring aspects and child's characteristics, the analysis using Pearson coefficient (*r*), showed that over-reactivity was the only domain that has significant association with the selected demographics. It was found that there is a significant and negative association between parent over-reactivity and the total number of children below age of 18 years ($r = -.13$, $p < 0.05$), and positive significant association with total score of caring aspect ($r = .27$, $p < .001$). As aforementioned, laxness and hostility had no significant association ($p > .05$). The results infer that parents with a greater number of children and higher scores on caring behaviors are more likely to be over-reactive than their counterparts.

Table 2: Descriptive characteristics of trust and reliance on sources of information among parents of children with respiratory problems (N= 363)

Variable	Not used		Unreliable		Weakly Reliable		Moderately Reliable		Highly Reliable		M	SD
	n	%	n	%	n	%	n	%	n	%		
Trust and reliance on Scientific sources, including scientific research and books	134	36.9	0	0	6	1.7	52	14.3	171	47.1	2.35	1.84
Social media	82	22.6	26	7.2	71	19.6	136	37.5	48	13.2	2.12	1.37
Official government or Ministry of Health website	168	46.3	3	0.8	18	5.0	78	21.5	96	26.4	1.81	1.76
Specialist doctor	1	.3	2	0.6	1	0.3	25	6.9	334	92.0	3.90	0.40
The nursing team	25	6.9	2	0.6	21	5.8	162	44.6	153	42.1	3.15	1.05
The pharmacist	25	6.9	3	0.8	29	8.0	183	50.4	123	33.9	3.04	1.04
Other non-health professionals	142	39.1	51	14.1	97	26.7	67	18.4	6	1.7	0.98	0.78
School nurse or doctor	191	52.6	11	3.0	50	13.8	84	23.1	27	7.4	1.30	1.48
Scientific seminars	183	50.4	6	1.7	27	7.4	77	21.2	70	19.3	1.57	1.69
Publications and advertisements in health centers	107	29.5	6	1.7	24	6.6	123	33.9	103	28.4	2.30	1.61
Television or radio	161	44.4	11	3.0	47	12.9	112	30.9	32	8.8	1.57	1.51
An influencer or social media celebrity	184	50.7	58	16.0	53	14.6	55	15.2	13	3.6	1.05	1.26
Parents of children who suffer from the same disease as my child	137	37.7	14	3.9	69	19.0	128	35.3	15	4.1	1.64	1.40

Table (3) Descriptive characteristics of caring behaviors among parents of children with chronic respiratory problems (N= 363)

Variable	M	SD
Teaching health and hygiene	2.77	.052
I pay attention to symptoms of illness early	2.50	0.71
I isolate his/her siblings from him if they get sick	1.76	0.96
I clean and sterilize his/her clothes and belongings	2.18	0.88
I make sure he/she is not physically exhausted by any work or duty	2.13	0.85
I avoid taking him/her on family visits during the winter	1.68	0.90
Wear a mask if you go to the market or mall.	1.11	1.01
I encourage him to engage and integrate with other children.	2.37	0.76

Table 4: Bivariate Correlation between parents' disciplines, health related behaviors and child characteristics (N = 363)

Variables	Caring behaviors	# children	# children below the age of 18	Age of child	Period being dx	Age of parents
Caring behaviors	-	-.22**	-.25**	-.03	-.03	-.05
Laxness	.05	-.02	-.05	.003	-.07	-.04
Over-Reactivity	.27**	-.08	-.13*	.003	-.04	-.06
Hostility	.095	-.09	-.04	.003	.08	-.05

HRB: Health Related Behaviors
** significant at $\alpha < .001$

To examine if there are differences in relation to sex of parents of children, t-test for two independent samples was used. The analysis showed (see table 5) that male and female parents were significantly different in relation to over-reactivity ($t = 2.41$, $p = .016$), while all other factors were not. On other hand, male and female parents were different in their caring behaviors ($t = 2.49$, $p = .013$). The analysis suggests that sex is associated with differences in over-reactivity and caring behaviors, with females scoring higher on both measures. See table 5

To examine whether there are differences based on whether parents of children work in the health sector, an independent samples t-test was conducted. The analysis (see table 5)

showed that parents who work in the healthcare sector are not statistically different in parental discipline. Nevertheless, parents working in health sector showed lower mean score in all domains of parental discipline than those who are not. On other hand, parents who work in the healthcare sector have significantly higher scores on the health-related factor compared to those who do not ($t = -5.24$, $p = 0.001$).

Regrading family history of respiratory diseases, the analysis using t-test for two independent samples showed no significant difference in any domain of the parental scale. Mean score showed that parents who have respiratory diseases have

higher score in laxness, over-reactivity, and health related behaviors, and lower in hostility.

Testing if there is a difference in marital status of parents in regard to variables of study, the analysis using ANOVA test showed no significant differences at all in all variables ($p > .05$). Regarding the parents' level of education, the analysis showed a significant difference in over-reactivity ($F = 4.26, p = .006$) and health-related behaviors ($F = 13.30, p < .001$). Post hoc comparisons (Scheffe) indicated that the difference in over-reactivity was significant between parents with a university degree and those with a diploma ($p = .04$). For health-related behaviors, the difference was significant between parents with a university degree and those with all other levels of education ($p < .05$). No significant differences were found in relation to hostility or laxness ($p > .05$).

DISCUSSION

Parental caring behaviors are important components in determining the healthcare outcomes of their children with respiratory and chronic illnesses. Specifically, when parents are the primary caregivers for children with medical conditions, their caring behaviors and sources of information can have a positive or negative impact on their child's health and well-being. This study provides valuable insights into the health practices of parents caring for children with respiratory problems in the post-COVID-19 era. The findings indicated that parents exhibit moderate to high levels of positive caring behaviors, such as

Table 5: Differences in parental disciplines related to sex (Number = 363)

Variables	Sex of parents	n	M	SD	t	p-value
Laxness factor	Female	302	3.72	.62	1.61	.106
	Male	61	3.58	.77		
Over-Reactivity	Female	302	5.18	.94	2.41	.016
	Male	61	4.86	1.01		
Hostility factor	Female	302	4.13	2.17	1.31	.192
	Male	61	3.73	2.12		
Health Related Factor	Female	302	19.53	4.46	2.49	.013
	Male	61	17.90	5.50		

Furthermore, this study found a significant negative association between the number of children and parent's caring behaviors. Similarly, a significant negative association was found between caring behaviors and the number of children below the age 18 years. These results suggested that having more young children is linked to poorer caring behaviors among parents, which might be explained to the higher level of stress which comes with increasing number of children as concluded by Kowal and his colleagues [18].

The study also found significant differences in over-reactivity and health-related behaviors between male and female parents, with females being more engaged in these areas. These findings are in line with what Fang and his colleagues reported [19-21]. Moreover, a significant difference was found in over-reactivity and caring behaviors based on the level of education. Higher education levels were associated with positive caring behaviors and less over-reactive discipline. One explanation could be related to the connection between higher level of education and level of awareness and ability to retrieve information regarding their parental role resulting in improve healthcare outcome. Such finding was supporting previous global systematic review studies that connect parents' education with positive healthcare outcomes for their children (22). This has also been addressed in Arabia families where the health-belief systems of parents affected by their level of education leading to better healthcare outcomes (23).

teaching health and hygiene, monitoring symptoms of illness early, and encouraging their children to engage and interact with others. These behaviors may be linked to practices adopted during the COVID-19 pandemic.

Notably, the emphasis on social interaction highlights parents' awareness of the importance of supporting their children's social and mental well-being. On the other hand, some behaviors need to be carefully monitored as they may have negative consequences, such as having the child wear a mask when going to the market or mall, and isolating the child's siblings from the sick child if they become ill. This suggests that parents may be more focused on caring for the sick child rather than being cautious about the infectiousness of the disease. The reluctance to use masks may stem from the desire to move away from mask-wearing, a sentiment carried over from the COVID-19 period.

Furthermore, this study found a significant negative association between the number of children and parent's caring behaviors. Similarly, a significant negative association was found between caring behaviors and the number of children below the age 18 years. These results suggested that having more young children is linked to poorer caring behaviors among parents, which might be explained to the higher level of stress which comes with increasing number of children as concluded by Kowal and his colleagues [18].

Parents demonstrated a strong trust in healthcare professionals, particularly specialists, but underutilized schools, including school nurses and doctors, as information sources, though nearly half of those who use them find them moderately to highly reliable. Interestingly, influencers and social media celebrities were not considered reliable sources of health information, highlighting the importance of relying on professional expertise. Additionally, a significant portion of parents did not use the official Ministry of Health website, which is assumed to be a reliable source. These findings might contradict a scoping review performed by Frey and his colleagues, who found that parents are motivated to use social media as source of health information for children [24].

Conclusion

The study highlights positive health practices and caring behaviors among parents of children with respiratory problems. However, it concludes that the number of children might have a negative impact on the level of caring aspects of parents. The study also emphasizes trust in healthcare professionals as a primary source of health information. Nevertheless, the study suggests that school nurses and the MOH website are underutilized as a source of information. These findings could help decision-makers launch targeted campaigns to engage parents in school awareness programs to promote healthy behaviors among children, as well as to include such data in their family planning campaigns. In addition, the study suggests

assessing the impact of health campaigns performed by the ministry on behavioral change among target audience.

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