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Research Article

Assessment of the Quality of Life and Relationship of Mental Status Among Parents with Cerebral Palsy Children in a Single Centre Study

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ABSTRACT

Introduction: Children with cerebral palsy (CP) in Bangladesh suffer immensely, with no means or hope for a decent life and a public system lacking basic facilities.This study aims to analyze the quality of life (QoL) and depression status of parents among children with CP, as well as the relationship between these factors and their demographic profile.

Materials and Methods: This is a descriptive cross-sectional study in which data were collected from the Pediatric Department of Centre for the Rehabilitation of the Paralysed (CRP) in Savar. The participants included 150 children with CP between January 2018 and December 2020.

Results: The mean age of the mothers (29.86±6.14) was between 25 and 29 years (32.7%). The most common type of CP was spastic CP among 100 mothers (66.7%). A significant relationship was observed between the mother's age during marriage and World Health Organization quality of life (WHOQoL-BREF), physical health (P<0.01), psychological health (P<0.01), and the age group of 31-35 years had the lowest scores (Mean±SD 62.00±5.16, 51±0.683) in both domains. A strong correlation (P<0.001) was observed between QoL, physical health (r=0.319), psychological (r=0.365), social (r=0.390) and environmental (r=0.388). From the box plot, QoL showed that spastic CP posed good QoL for mild depression while all other types had neither poor nor good QoL.

Conclusion: A hidden issue in every parent is that CP children are the misfortune of their fate that increases their level of depression and consequently decreases their QoL.

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Introduction

The birth of a child offers enormous joy to most families, but it also comes with additional duties and tasks. However, when physical or intellectual problems are detected early in a child's life, the parent's loving role takes on a different meaning. One of the most common developmental impairments is cerebral palsy (CP), which is a chronic disease that does not progress but the condition is improved or maintained by involving themselves in education and rehabilitation treatment [1]. The estimated prevalence of CP is 2 to 3 per 1 000 child births [2] worldwide and 70 per 1 000 live births among 2-9 years in Bangladesh [3]. Globally in developing countries, 85% of children with disabilities live but <5% receive rehabilitation services [4] and only 1 500 children get the opportunity to study in special schools with the help of the government and non-governmental organizations [5]. When parents have children with impairments, they want to improve their children's health, but the result of this long journey makes them suffer from chronic sorrow and have higher levels of depression than parents without children with disabilities [6]. In research, it is also found that a caregiver's well-being is directly related to or depends on a child's well-being [7]. Research reveals that a high anxiety rate and a considerable depression level are found in caregivers of children with CP and with limitations of emotional aspects, leading to a low quality of life (QoL). Literature reveals that 35% to 53% of parents of children with disabilities have depression [8] and those family members who have a disabled child suffer very high levels of depression and stress [9]. The degree of depression and anxiety is a unique indicator of a person's mental health status, and parents of children with disabilities experience higher levels of stress and a lower standard of living [10, 11]. Children's chronic disability not only affects mothers but also all members of the family and this chronic state disturbs the family relationship [12]. In Bangladesh, mothers usually do the daily activities and take on more household responsibilities, and children with CP are highly dependent on caregivers/mothers, therefore, mothers experience psychological distress, and excessive responsibility adversely affects their physical and psychological health [13]. In Bangladesh, researchers, the government, and service providers cannot find out current and future resource distribution and preventive strategies.

Materials and Methods

Study design

A descriptive cross-sectional study was conducted to assess the QoL and level of depression in parents with CP children. A purposive sampling technique has been employed to select the sample size. Data were collected using a structured questionnaire through face-to-face interviews. The questionnaire was the World Health Organization quality of life brief version (WHOQoL-BREF) and validated Bangla patient health questionnaire-9 (PHQ-9) [14] has been deployed as a data collection instrument. The inclusion criteria included CP confirmed by a pediatrician, the age range of CP children above 5 years, and parents with CP as their dependent caregivers. The exclusion criteria included the age range of CP children below five years, and children with other diseases, such as spina bifida, club feet, and autism spectrum disorder. The collected data is sorted and cleaned and confidentiality is maintained with utmost care.

Study setting and participants

Centre for Rehabilitation of the Paralyzed (CRP) is a well-recognized, well-renowned rehabilitation center, especially for spinal cord injury (SCI) patients in Bangladesh. Data were collected from inpatients. The study period was from January 2018 to December 2020. CRP is known as the mother organization in Bangladesh for rehabilitation of the physically challenged patients. CRP is a not-for-profit organization that receives referrals from different hospitals and from all over Bangladesh [15].

Statistical analysis

The statistical tool of SPSS software, version 20 was used to examine the data (SPSS Inc., Chicago, IL, USA) [16]. Considering the study's objectives, descriptive statistics (Mean±SD) were computed for the two sets of outcomes (i.e. QoL and mental health) and potential confounders (i.e. sociodemographic information).

Results

Table 1 presents the socio-demographic characteristics of the analytical sample. A total of 150 people in the age range from 20 to 39 years (38.16 years) participated in the study. Forty-nine respondents (32.7%) were between 25 and 29 years old. The age of 97 children (64.7%) was between 6 and 10 years and the gender of 101 children (67.3%) was male. A total of 50 women (33.3%) com-

Table 1. Sociodemographic variables of CP children (n=150)

Variables	Category	No. (%)
Mothers' age (y)	20-24	24(16.0)
	25-29	49(32.7)
	30-34	34(22.7)
	35 to 39	36(24.0)
	>39	7(4.7)
Mothers' age (y)	0-5	38(25.3)
	6-10	97(64.7)
	11-15	15(10.0)
Child's gender	Boy	101(67.3)
	Girl	49(32.7)
Mothers' education	Illiterate	9(6.0)
	Primary	35(23.3)
	SSC	50(33.3)
	HSC	34(22.7)
	Bachelor	14(9.3)
	Masters	8(5.3)
Fathers' education	Illiterate	12(8.0)
	Primary	30(20.0)
	SSC	38(25.3)
	HSC	39(26.0)
	Bachelor	17(11.3)
	Masters	14(9.4)
Mothers' occupation	House wife	139(92.7)
	Service holder	9(6.0)
	Teacher	2(1.3)
Fathers' occupation	Service holder	73(48.7)
	Farmer	13(8.7)
	Businessman	36(24.0)
	Day laborer	28(18.7)

Variables	Category	No. (%)
Monthly income (Bangladeshi Taka)	3000-5000	28(18.7)
	5000-10000	54(36.0)
	10000-15000	59(39.3)
	15000-20000	9(6.0)
Marital status	Married	146(97.3)
	Widow	3(2.0)
	Separation	1(0.7)
Cousin marriage	Yes	21(14.0)
	No	129(86.0)
Mothers age during married time (y)	<18	81(54.0)
	19-25	65(43.3)
	31-35	4(2.7)
Mothers age during delivery time (y)	<18	29(19.3)
	19-25	106(70.7)
	31-35	12(8.0)
	>35	3(2.0)
Mothers' health during delivery time	Good	98(65.3)
	High blood pressure	6(4.0)
	Frequent urination disease	2(1.3)
	Low blood pressure	16(10.7)
	Sickness	28(18.7)
Type of medication during pregnancy time	No medication	77(51.3)
	Folic acid tablet	26(17.3)
	Iron tablet	38(25.3)
	pain killer tablet	9(6.0)
Weight during pregnancy time	Enough weight	37(24.7)
	Low weight	65(43.3)
	Excess weight	34(22.7)
	Don't know	14(9.3)
Disease during pregnancy	High pressure	18(12)
	Jaundice	2(1.3)
	Diabetics	1(0.7)
	Sexual disease	2(1.3)
	Fever	19(12.7)

Variables	Category	No. (%)
Healthcare facilities in the local area	Village hiller	11(7.3)
	Homeopathic	9(6)
	Ayurveda	2(1.3)
	Hospital	79(52.7)
	Clinic	49(32.7)
History of miscarriage	Once	27(18.0)
	Twice	22(14.7)
	Three times	6(4.0)
	No history of miscarriage	95(63.3)
Birth history of child (m)	<9	62(41.3)
	9	69(46.0)
	>9	19(12.7)
Delivery of birth attended by	Doctor	65(43.3)
	Nurse	42(28.0)
	Attendance	43(28.7)
Place of delivery	House	50(33.3)
	Hospital	66(44.0)
	Clinic	34(22.7)
Delivery time	>12 hours	78(52.0)
	<12 hours	51(34.0)
	Sudden delivery	21(14.0)
Minutes until baby cried	Within birth	46(30.7)
	5 s-30 minutes	66(44.0)
	>30 minutes	38(25.3)
Babies weight during delivery time (kg)	2.5-3.5	66(44.0)
	<2.5	62(41.3)
	>3.5	22(14.7)
After birth complication	Jaundice	45(30.0)
	Water deficiency	5(3.3)
	Pneumonia	31(20.7)
	Seizure	59(39.3)
	Accident	4(2.7)
	Breathing problems of the child	3(2.0)
	Hydrocephalus	3(2.0)

Variables	Category	No. (%)
Type of birth injury	Brain injury	58(38.7)
	No injury	92(61.3)
Type of cerebral palsy	Spastic	100(66.7)
	Ataxic	9(6.0)
	Athetoid	16(10.7)
	Mixed	25(16.7)

Abbreviations: SSC: Secondary school; HSC: Higher secondary school.

pleted their secondary school (SSC), while 39 men (26%) completed their higher secondary school (HSC). A total of 139 women (92.7%) were housewives, while 36 men (24%) were businessmen. The main family income of 59 people (39.3%) ranges from 10,000 Bangladeshi taka (BDT) to 15,000 BDT. A total of 146 people (97.3%) were married and only 21 people (14%) reported cousin marriage. Eighty-one mothers (54%) were under the age of 18 when they married, and 107 mothers (70.7%) were between the ages of 19 and 25 years when they gave birth. The health during the birth of 98 mothers (65.3%) was satisfactory, and 26 mothers (17.3%) received the most common medication of folic acid tablet. Most of them (43.3%) were underweight during pregnancy and the most prevalent co-morbidity in 19 mothers (12.7%) was fever. Seventy-nine mothers (52.7%) rely on hospital services for health treatment, and 27(18%) had a miscarriage at least once. During delivery birth, 65 people (43.3%) attended, the place of delivery in 66 mothers (44%)was in the hospital, the delivery time in 78 mothers (52%), the minutes till the baby screamed in 66 mothers (44%), and the weight of 66 (44%) infants during delivery was 2.5 to 3.5 kg. Seizures in 59 mothers (39.3%) were the most prevalent problem after delivery. The most common kind of cere- bral palsy in 100 mothers (66.7%) is spasticity (Table 1).

According to the analysis of variance (ANOVA), two dependent variables were WHOQoL and PHQ-9, and the factor variables were the father's occupation. Service holders (Mean±SD 3.91±0.98, 36.38±10.75) and businessmen (Mean±SD 3.14±0.899, 37.78±8.62) had higher QoL and higher social relations scores than farmers (Mean±SD 2.15±0.689, 28.00±5.65) and day laborer (Mean±SD 2.98±1.08, 32±8.87). Father's occupation group also had a significant relationship with PHQ-9 scores (F=2.65, P<0.01), so that farmers had the highest depressive score (Mean±SD 18.23±3.14) and service holders had the lowest depressive score (Mean±SD 16.14±3.509). A significant relationship was observed between monthly income and WHOQoL in the QoL domain (F=4.091, P<0.001), social relation domain (F=3.691, P<0.01), and environment domain (F=3.749, P<0.01). The lowest monthly income group 3 000-5 000 BDT had the lowest QoL scores (Mean±SD 2.46±0.793), social relation scores (Mean±SD 30.29±8.105), and environment scores (Mean±SD 74.57±16.62). Mothers aged 31-35 years during marriage had a significant relationship with WHOQoL, indicating that the lowest mean score means lower QoL and highest in the physical health domain (F=4.465, P<0.01), psychological health domain (F=3.14, P<0.01) and the age group of 31-35 years had the lowest scores (Mean±SD 62.00±5.16, 51±0.683) in both domains. PHQ-9 showed a significant relationship with the mothers' age during marriage time where the same age group had the highest depressive scores (F=4.395, P<0.01), (Mean±SD 21.75±0.5). A significant relationship was observed between the weight of mothers during pregnancy with WHOQoL, QoL scores (F=3.15, P<0.05) and the sufficient weight group had the highest QoL scores (Mean±SD 3.30±0.968). A significant relationship was observed between type of health care facilities in local area and WHOQoL in all domains, QoL (F=6.12, P<0.001), physical health (F=5.921, P<0.001), psychological health (F=5.934, P<0.001), social relation (F=5.444, P<0.001) and environment (F=7.321, P<0.001) where village healer had the lowest QoL scores in all domains (Mean±SD 2.00±0.00, 63.56±14.20, 47.11±5.57, 23.11±1.76, 59.11±9.11). On the other hand, A significant relationship was observed between the type of healthcare facilities in the local area and PHQ-9 scores (F=2.942, P<0.01) where village healer also had the highest depressive scores (Mean±SD 19.78±3.19) than others (Table 2).

Table 2. One-way analysis of variance (ANOVA) in between demographic variables with WHOQoL and PHQ-9

Variables	Category	No.	WHOQoL										PHQ-9	
			QoL		Physical Health		Psychological		Social Relations		Environment		PHQ Total Score	
			Mean±SD	F	Mean±SD	F	Mean±SD	F	Mean±SD	F	Mean±SD	F	Mean±SD	F
Mothers age (y)	20-24	24	3.13± 1.076	0.166	83.67± 19.664	0.435	70.83± 20.276	0.515	35.33± 9.558	0.306	85.83± 19.237	0.162	15.96± 4.457	0.956
	25-29	49	3.02± 1.010		82.86± 15.275		67.51± 16.117		34.04± 9.665		83.67± 15.850		16.71± 3.385	
	30-34	34	3.09± 1.083		84.47± 12.755		71.76± 15.846		36.47± 11.642		82.82± 18.225		17.26± 3.423	
	35-39	36	2.94± 0.893		80.44± 13.447		67.89± 15.871		35.33± 9.146		84.00± 15.971		17.72± 3.526	
	>39	7	3.14± 0.900		79.43± 8.772		65.71± 13.035		35.43± 9.071		81.14± 10.254		16.86± 4.298	
Child's age (y)	0-5	38	2.95± 1.012	0.262	82.21± 15.856	0.097	68.95± 18.234	0.447	35.89± 10.334	0.357	82.74± 17.697	0.225	16.63± 3.802	0.932
	6-10	97	3.08± 1.007		82.97± 14.925		68.45± 16.369		35.18± 10.181		84.45± 16.772		16.92± 3.707	
	11-15	15	3.00± 0.926		81.33± 11.678		72.80± 12.935		33.33± 6.705		82.13± 13.511		18.13± 2.825	
Childs gender	Boy	101	3.03± 1.044	0.033	81.39± 15.712	2.142	67.96± 16.909	1.260	35.33± 10.168	0.074	82.77± 17.015	1.150	17.13± 3.751	0.606
	Girl	49	3.06± 0.899		85.14± 12.490		71.18± 15.599		34.86± 9.416		85.88± 15.814		16.63± 3.462	

Variables	Category	No.	WHOQoL										PHQ-9	
			QoL		Physical Health		Psychological		Social Relations		Environment		PHQ Total Score	
			Mean±SD	F	Mean±SD	F	Mean±SD	F	Mean±SD	F	Mean±SD	F	Mean±SD	F
Fathers education	Illiterate	12	2.67± 0.888	1.380	81.00± 15.457	0.411	66.33± 15.204	1.063	32.00± 8.697	1.165	81.00± 17.152	0.794	16.92± 3.088	0.363
	Primary	30	2.93± 1.202		82.80± 14.409		71.07± 19.131		34.93± 11.647		79.73± 18.582		17.00± 3.474	
	SSC	38	2.92± 1.050		81.37± 17.529		66.63± 17.554		33.58± 9.325		82.95± 18.499		16.63± 3.745	
	HSC	39	3.13± 0.864		82.05± 13.326		67.90± 14.725		35.28± 9.125		85.95± 15.075		17.05± 3.967	
	Bachelor	17	3.06± 1.029		84.47± 14.063		68.71± 13.056		39.06± 10.250		85.88± 15.692		17.94± 3.030	
	Masters	14	3.62± 0.506		85.23± 13.405		75.38± 16.721		36.92± 9.543		87.69± 11.010		16.43± 4.363	
Mothers education	Illiterate	9	2.56± 0.726	0.977	82.22± 8.511	0.532	66.22± 11.681	0.236	31.56± 6.464	1.337	85.33± 18.000	0.731	17.67± 3.202	0.408
	Primary	35	2.97± 1.224		81.83± 14.946		67.66± 20.543		34.06± 12.054		79.54± 18.427		16.74± 3.501	
	SSC	50	3.02± 0.937		84.16± 15.938		68.48± 15.787		35.20± 8.514		85.52± 17.026		16.52± 4.166	
	HSC	34	3.06± 1.013		81.53± 14.406		70.94± 15.918		37.18± 10.766		84.94± 15.352		17.35± 3.338	
	Bachelor	14	3.29± 0.825		85.43± 16.649		70.86± 14.416		38.29± 7.640		86.29± 14.440		17.64± 3.671	
	Masters	8	3.50± 0.535		76.50± 11.796		70.00± 14.967		30.00± 8.816		80.50± 14.253		17.13± 3.182	

Variables	Category	No.	WHOQoL										PHQ-9	
			QoL		Physical Health		Psychological		Social Relations		Environment		PHQ Total Score	
			Mean±SD	F	Mean±SD	F	Mean±SD	F	Mean±SD	F	Mean±SD	F	Mean±SD	F
Fathers occupation	Service holder	73	3.19± 0.981	3.55***	82.85± 15.797	0.550	69.81± 17.244	0.688	36.38± 10.753	3.88***	85.15± 16.485	2.208	16.14± 3.509	2.650**
	Farmer	13	2.15± 0.689		78.77± 14.822		62.15± 18.375		28.00± 5.657		74.15± 16.216		18.23± 3.140	
	Business-man	36	3.14± 0.899		84.56± 13.861		70.44± 15.485		37.78± 8.629		87.67± 13.501		18.11± 3.576	
	Day lobourer	28	2.98±1.08		81.29±13.51		68.81±14.92		32±8.57		79.71±19.07		17.07±3.94	
Mothers occupation	House wife	139	3.02± 1.003	0.413	82.68± 14.585	0.035	68.78± 16.449	0.640	35.17± 9.909	0.007	83.71± 16.961	0.352	16.91± 3.576	0.366
	Service holder	9	3.33± 0.866		82.22± 17.563		74.22± 17.789		35.11± 9.752		86.67± 11.662		17.33± 4.975	
	Teacher	2	3.00± 1.414		80.00± 28.284		62.00± 19.799		36.00± 16.971		76.00± 16.971		19.00± 4.243	
Monthly income (BDT)	3000-5000	28	2.46± 0.793	4.091***	76.57± 14.182	1.950	62.71± 15.165	1.815	30.29± 8.105	3.691**	74.57± 16.625	3.749**	17.11± 3.155	0.492
	5000-10000	54	3.17± 1.005		83.93± 15.414		71.04± 16.592		37.04± 9.711		86.44± 13.778		17.13± 3.732	
	10000-15000	59	3.19± 0.991		84.07± 14.527		69.63± 17.070		35.12± 10.267		85.49± 18.208		16.97± 3.746	
	15000-20000	9	3.11± 1.054		84.00± 11.832		72.44± 13.482		39.56± 9.262		85.33± 14.000		15.56± 4.333	

Variables	Category	No.	WHOQoL										PHQ-9	
			QoL		Physical Health		Psychological		Social Relations		Environment		PHQ Total Score	
			Mean±SD	F	Mean±SD	F	Mean±SD	F	Mean±SD	F	Mean±SD	F	Mean±SD	F
Cousin marriage	Yes	21	3.00± 1.095	0.039	80.19± 17.457	0.653	68.57± 18.816	0.017	34.86± 11.182	0.025	83.05± 18.195	0.048	16.10± 3.948	1.391
	No	129	3.05± 0.983		83.01± 14.362		69.09± 16.184		35.22± 9.722		83.91± 16.450		17.11± 3.602	
Mothers age during married time	Under 18 y	81	3.07± 1.058	1.313	84.00± 15.349	4.465**	70.86± 17.369	3.149**	35.56± 9.423	2.216	84.64± 16.327	1.302	16.52± 3.685	4.395**
	19-25 y	65	3.05± 0.926		82.15± 13.603		67.82± 15.140		35.32± 10.502		83.51± 17.212		17.23± 3.517	
	31-35 y	4	2.25± 0.500		62.00± 5.164		51.00± 6.831		25.00± 2.000		71.00± 9.452		21.75± 0.500	
Weight during pregnancy time	Enough weight	37	3.30±0.968	3.15*	82.59±1.95	0.746	70.49±15.67	0.714	34.70±8.95	1.193	83.89±17.52	0.274	17.27±3.36	0.708
	Low weight	65	3.05±0.991		80.86±14.46		67.02±17.74		33.85±9.25		82.58±17.37		16.62±3.60	
	Excess weight	34	3.03±0.937		84.59±14.10		69.53±14.73		37.18±10.90		85.76±15.03		17.56±4.12	
	Don't know	14	2.36±1.008		86.00±15.27		73.14±17.21		37.71±12.32		84.29±15.72		16.36±3.522	

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Variables	Category	No.	WHOQoL										PHQ-9	
			QoL		Physical Health		Psychological		Social Relations		Environment		PHQ Total Score	
			Mean±SD	F	Mean±SD	F	Mean±SD	F	Mean±SD	F	Mean±SD	F	Mean±SD	F
Type of health care facilities in local area	Village healer	9	2.00± 0.000	6.120***	63.56± 14.205	5.921***	47.11± 5.578	5.934***	23.11± 1.764	5.444***	59.11± 9.117	7.321***	19.78± 3.193	2.942**
	Homeo pathic	9	2.22± 0.441		75.11± 13.233		60.00± 14.697		32.00± 8.718		76.00± 13.711		19.44± 3.167	
	Aurbedic	4	2.25± 1.258		76.00± 15.663		74.00± 16.166		27.00± 8.869		85.00± 17.397		17.25± 3.686	
	Hospital	79	3.19± 0.962		85.32± 14.742		71.49± 16.447		36.76± 9.924		84.91± 16.677		16.44± 3.679	
	Clinic	49	3.20± 1.000		83.67± 12.378		70.29± 15.166		36.08± 9.291		87.84± 14.118		16.82± 3.486	
Type of cerebral palsy in children	Spastic	100	2.99± 1.030	0.939	82.40± 14.606	0.905	67.40± 16.993	1.794	33.84± 9.854	1.885	82.08± 17.445	1.944	17.23± 3.821	0.928
	Ataxic	9	3.56± 0.882		90.22± 14.981		80.00± 18.000		37.78± 9.821		92.44± 11.907		15.22± 3.232	
	Athetiod	16	3.13± 0.885		82.25± 16.064		70.25± 14.457		38.50± 10.106		90.00± 14.236		16.63± 3.243	
	Mixed	25	3.00± 0.957		80.96± 14.800		70.72± 14.223		37.44± 9.443		83.52± 14.981		16.76± 3.333	

Abbreviations: PHQ-9: Patient health questionnaire-9; SSC: Secondary school; HSC: Higher secondary school; WHO: World health organization; BDT: Bangladeshi taka.

*P<0.01, **P <0.05, ***P<0.001.

Table 3. Correlation coefficient in between QoL and PHQ-9

Variables	QoL	Physical Health	Psychological	Social Relations	Environment	PHQ-9
QoL	1	0.319***	0.365***	0.390***	0.388***	-0.241**
Physical health		1	0.651***	0.612***	0.635***	-0.289***
Psychological			1	0.597***	0.639***	-0.295***
Social relations				1	0.675***	-0.280***
Environment					1	-0.276***
PHQ-9						1

QoL: Quality of life; PHQ-9: Patient health questionnaire-9.

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**P<0.05, ***P<0.001.

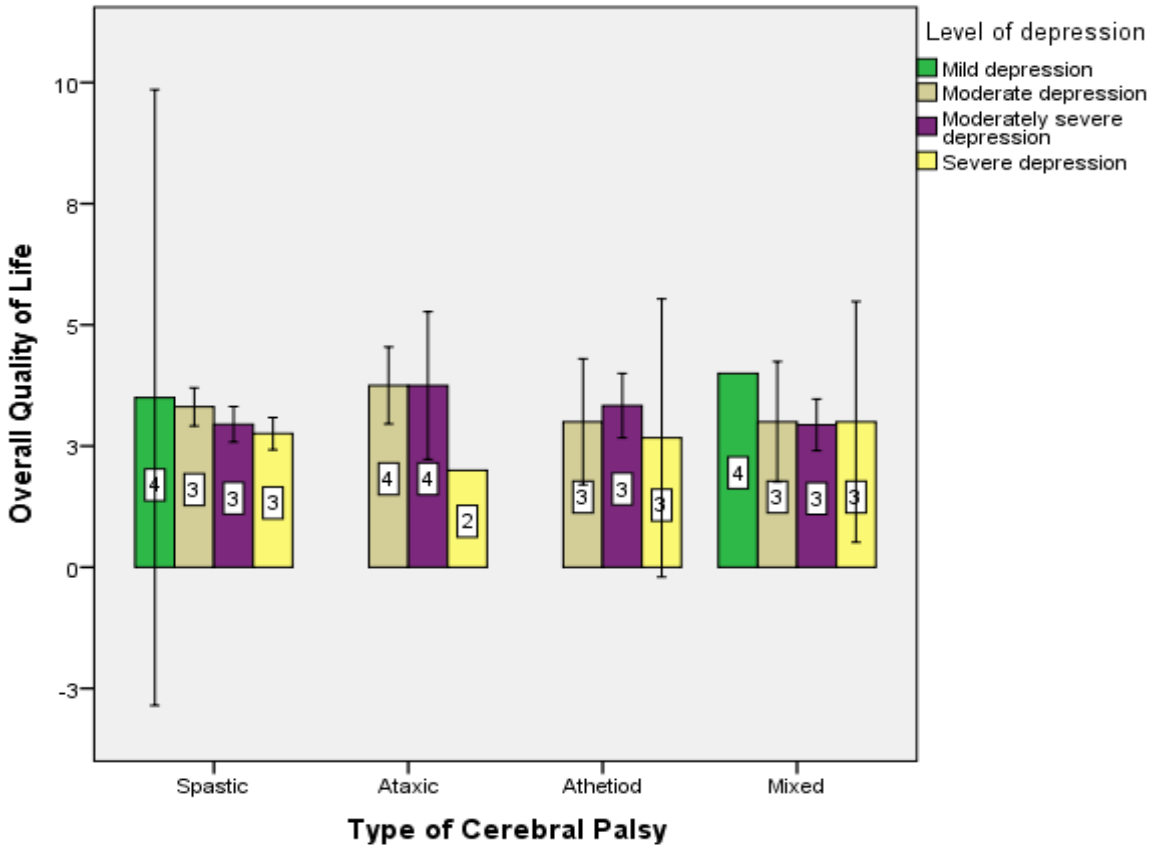

Figure 1. Box plot for level of depression, type of CP and QoL

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The correlations among the variables of WHOQoL and PHQ-9 scores were calculated. The PHQ-9 showed strongly negative correlations with WHOQoL scores. A strong correlation (P<0.001) was observed between QOL and physical health (r=0.319), psychological (r=0.365), social relationship (r=0.390), and environment (r=0.388). A significant correlation was observed between physical health with psychological state (r=0.651), social relations (r=0.612), and environment (r=0.635). Moreover, psychological state showed a strong correlation with social relations (r=0.597) and environment (r=0.639) in social relations showed a positive correlation with environment (r=0.675). Table 3 presents all bivariate correlations among the variables.

QoL shows that spastic CP poses good QoL for mild depression whereas all other types have neither poor nor good QoL; ataxic CP shows good QoL for moder-

ate depression and moderately severe depression; athetoid CP shows neither good nor poor QoL for moderate depression, moderately severe depression, and severe depression; and mixed CP shows good QoL for mild depression and has neither poor nor good for moderate depression, moderately severe depression and severe depression (Figure 1).

Discussion

The demographic profile showed that the most common age was between 6 and 10 years in 97 children (64.7%) and the gender of 101 children (67.3%) was male. In this study, the prevalence of different types of CP was as follows, spastic CP 66.7%, ataxic CP 6%, athetoid CP 10.7%, and mixed CP 16.7%. This is slightly higher than the previous study published in Turkish, indicating that the most prevalent type of CP in their study was spastic bilateral hemiplegia, with a prevalence of (43.3%) [17]. In addition, two studies [18, 19] from developing countries showed that spastic quadriplegia is the most common type of CP (rates between 36% and 71%) while another two studies [20, 21] from developed countries revealed that it is spastic diplegia (rates between 5% and 47%).

Service holders and businessmen had higher QoL and higher social relations scores than farmers and daily laborers. PHQ-9 showed that farmers have the highest depressive score (Mean±SD 18.23±3.14) and service holders have the lowest depressive score (Mean±SD 16.14±3.509). A significant relationship was observed between mothers aged 31-35 years during the marriage and WHOQoL in the physical and psychological health domain indicated that the lowest mean scores mean lower QoL and PHQ-9 showed the highest depressive scores ($F=4.395$, $P<0.01$). A Turkish study used beck's depression inventory II to assess the depression of mothers with CP children, and showed that they had a lower QoL and a higher level of depression [22]. Our results are consistent with other authors' results [23]. On the other hand, mothers with sufficient weight during pregnancy pose higher QoL. The PHQ-9 showed strongly negative correlations with WHOQoL scores. A strong correlation ($P<0.001$) was observed between QOL, physical health ($r=0.319$), psychological ($r=0.365$), social relationship ($r=0.390$), and environment ($r=0.388$). The box plot showed the least QoL represented by ataxic CP while spastic and mixed poses good QoL with mild depression. The relationship between children's functional level and parental depression can be moderated by social relationships. In a study from Bangladesh, Mobarak and others found that of 91 mothers with children with cerebral palsy, 41.8% had a risk for psychiatric morbidity [24]. Mothers should be encouraged to take part in social activities related to their interests, and those with depressive symptoms should be psychologically supported. Therefore, mothers, undertaking the most significant role in the rehabilitation and caring for the child, should be better interested in CP children.

Evidence from Diwan et al. [25] showed that 70%of mothers with CP children have mild-to-moderate depression, and this depression has a negative impact on health-related QoL. Women are more likely to take care of disabled children in 86% of cases due to cultural influences in Bangladesh, and must spend a significant amount of time on the challenges of the disability. As a result, we believe that the physical and mental health of mothers is harmed. Fathers usually earned a living for the family. According to current research, the QoL of moms of CP children is negatively impacted. The study conducted by Hirose and Ueda also supports this observation [26]. Among parents of children with hemiplegia, clinical anxiety, and moderate depression are approximately four and five times more common than among parents of children without disability, respectively [27]. The vital predictors of well-being in caregivers were the child's level of impairment, caregiving demand, and family structure, the higher the child's impairment is, the higher the caregiver's physical and psychological impairment is; the lower the child's impairment is, the higher the caregiver's self-perception and well-being.

Conclusion

Having a CP child may cause maternal depression; thus, to improve CP rehabilitation processes, mother needs to play a vital role in their treatment and rehabilitation. As a result, health practitioners should evaluate the psychological condition of mothers, and treatment or prevention of depression in mothers is advised to improve the rehabilitation process and obtain better results in these children. This study showed that most mothers and fathers were neglected. Given the importance of fathers in the family, assessing their status may help enhance the quality of treatments. This study was cross-sectional; nonetheless, interventional studies and analyzing the rate of change in mothers' psychological difficulties may enhance the rehabilitation process for CP children.

Ethical Considerations

Compliance with ethical guidelines

The researchers were duly concerned regarding the ethical aspects of the study and formal permission was obtained from the Ethical Review Committee (ERC) of CRP, Savar, Dhaka, Bangladesh, to conduct this study (Code: CRP-R&E-0401-220). Helsinki guidelines have been followed and all information from admitted patients has been obtained and stored safely. Confidentiality of the person and the information was maintained and observed throughout the study.

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Authors' contributions

Conceptualiziation: Easmin Ara Doly, Mohammad Ainur Nishad Rajib, Aminul Haque Rasel, Shujayt Gani; Data collection and data curation: Easmin Ara Doly, Mohammad Ainur Nishad Rajib and Shujayt Gani; Validation: Easmin Ara Doly, Zannatul Mawa and Zahid Hossain; Visualization: Zannatul Mawa, Farzana Sharmin and Zahid Hossain; Model development: Zannatul Mawa, Mohammad Nazmul Hasan and Shujayt Gani; Formal analysis: Mohammad Nazmul Hasan, Mohsina Sultana and Zahid Hossain; Writing the manuscript: Mohammad Nazmul Hasan, Mohsina Sultana and Aminul Haque Rasel; Review and editing: Mohsina Sultana, Farzana Sharmin, Mohammad Ainur Nishad Rajib and Aminul Haque Rasel.

Conflict of interest

The authors declared no conflict of interest.

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