

# Health-related quality of life of the children of health professionals

QUALIDADE DE VIDA RELACIONADA À SAÚDE DE FILHOS DE PROFISSIONAIS DA ÁREA DE SAÚDE

CALIDAD DE VIDA RELACIONADA A LA SALUD DE LOS HIJOS DE PROFESIONALES DEL ÁREA DE SALUD

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## ABSTRACT

In this study, we measured the health-related quality of life (HRQOL) and fatigue of the children of health professionals, aged between two and eleven years, and assessed the daytime and sleep habits of these children and their parents. The study included children from a public school. Data regarding demographics and daily habits were collected. The HRQOL, sleep habits and fatigue were measured using questionnaires. A total of 249 parents participated – 63.5% reported getting an adequate amount of sleep, while 47.4% woke up feeling tired. The children's mean age was 5.6 years – 62.2% watched television in their rooms, 50% used the computer (> 4 hours/day) and 27.8% engaged in extracurricular physical exercise. The sleep score was  $45.8 \pm 12.2$ . The HRQOL scores were higher in the physical and lower in the emotional aspects. We found that poorer sleep on the part of both children and parents may be related to the children's lower HRQOL. We conclude that the inadequate habits of parents as well as children, are related to a decrease in HRQOL, particularly regarding the emotional aspect.

## RESUMO

Neste estudo mensuramos a qualidade de vida relacionada à saúde (QVRS) e a fadiga de filhos de profissionais da área da saúde, com idades entre 2 e 11 anos, e avaliamos os hábitos diários e o sono dessas crianças e dos respectivos pais. Foram incluídas no estudo crianças de uma escola pública. Dados demográficos e dados de hábitos diários foram colhidos. A QVRS, o sono e a fadiga foram mensurados por questionários. Participaram 249 pais – 63,5% referiram sono adequado e 47,4% acordavam cansados. A média da idade das crianças foi 5,6 anos – 62,2% assistiam televisão no quarto, 50% usavam computador (> 4 horas/dia) e 27,8% faziam atividades físicas extracurriculares. O escore do sono foi de  $45,8 \pm 12,2$ . Os escores de QVRS foram mais elevados no aspecto físico e mais baixos no emocional. Detectamos que o sono de pior qualidade dos filhos e dos pais pode estar relacionado à pior QVRS dos filhos. Concluímos que os hábitos inadequados dos pais, bem como das crianças, estão relacionados a uma diminuição da QVRS dos filhos, especialmente no aspecto emocional.

## RESUMEN

Se mensuró la calidad de vida relacionada a la salud (QVRS), fatiga y se evaluaron hábitos diarios y de sueño de hijos de profesionales del área de salud, con entre 2 y 11 años de edad, y sus padres. Recolectados datos demográficos y de hábitos diarios. La QVRS, sueño y fatiga se midieron mediante cuestionarios. Participaron 249 padres, 63,5% refirió sueño adecuado, 47,4% despertaba cansado. Media etaria de niños de 5,6 años; 62,2% veían televisión en su cuarto, 50% utilizaba computador (>4 horas diarias), 27,8% realizaba actividad física extracurricular. Su puntaje de sueño fue  $45,8 \pm 12,2$ . Puntajes de QVRS más elevados en aspecto físico y menores en aspecto emocional. El sueño de peor calidad de padres e hijos puede relacionarse con peor QVRS de los hijos. Concluimos en que los hábitos inadecuados de padres e hijos se relacionan con una disminución de la QVRS de los hijos, particularmente en el aspecto emocional.

## DESCRIPTORS

Child  
Health personnel  
Sleep  
Fatigue  
Quality of life  
Questionnaires

## DESCRIPTORES

Criança  
Pessoal de saúde  
Sono  
Fadiga  
Qualidade de vida  
Questionários

## DESCRIPTORES

Niño  
Personal de salud  
Sueño  
Fatiga  
Calidad de vida  
Cuestionarios

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## INTRODUCTION

Health-related quality of life (HRQOL) in children is a current topic that has been studied in recent years in various populations, especially due to the many changes observed in families' lifestyles. Recent studies<sup>(1-4)</sup> addressing children and adolescents show that modern habits, known to be inappropriate, such as excessive exposure to TV, video games and computers, reduced sleep and irregular meal times, negatively influence various HRQOL scores, especially emotional and social scores, measured through standardized questionnaires.

Over the first years of growth and development, children are positively or negatively influenced by family habits, since the parents and older siblings are the closest models. We know, however, that the lifestyle of many families does not always enable an ideal balance between work and family activities, especially for families living in megacities. This situation can be aggravated in the case of professionals exposed to intense and stressful workloads, with limited time for leisure and rest. Examples of such professionals include physicians, nurses and other health workers, who deal with human life in their daily practice, and for this reason are subject to constant stress. This problem may be more evident in facilities caring for highly complex cases such as specialized units, intensive care units, and surgical centers, among others.

Studies show that health workers<sup>(5-9)</sup> present low levels of HRQOL in addition to high levels of stress and anxiety. There are, however, few studies reporting data concerning the impact of the lifestyle of these professionals on their close family members, such as spouses and children, which motivated us to address this aspect in more depth. This study's objective was to measure HRQOL and fatigue in children of health workers and evaluate the daily habits and sleep patterns of these children in addition to the quality of the sleep of the professionals themselves.

## METHOD

### Study design: cross-sectional and field study.

*Study's setting:* A public school primarily providing care for children of health professionals working in a typical tertiary hospital and its premises was included in this study. It includes daycare and preschool (3-month to 5 year-old children) and elementary school (6 to 11-year old children). There are currently 550 enrolled children divided into 22 classrooms. School hours are 6:45am to 7:45pm from Monday to Friday. It is located approximately 300 meters from the main hospital facility and parents can visit their younger children according to the convenience of each family.

### Participants

Free and informed consent forms and a summary of the protocol were sent to all 450 parents of the children

aged from 2 to 10 years old. A total of 249 parents (55.3%) authorized their children to be included in the study, regardless of their professional activity. In some cases, the parents had more than one child enrolled in the school and were instructed to complete the questionnaire for the oldest child only.

### Inclusion and exclusion criteria

The only exclusion criterion previously established was the children's caregivers being unable to understand or complete the protocol. No child was excluded from the study due to this reason.

### Data collection procedure

The study's protocol was sent to the parents and/or caregivers together with the schedule of the children selected for the study accompanied by a manual clarifying the study's objectives and instructing how to complete the questionnaires directed to the parents and/or caregivers. The researchers applied the questionnaires directed to the children during their recess period and between teaching activities.

### Data collection instruments

a) Questionnaires directed to the caregivers addressing their demographic data and those of their children:

- Caregivers' information: gender, age, number of children, marital status, occupation, type of activity and work hours, transportation used to commute to the hospital, commuting time, chronic pain, (appropriate or inappropriate) sleep patterns.

- Children's data: age, gender, how long the child remains at school, daily habits (TV, computer, video games, physical exercise, extracurricular activities), chronic pain, and chronic diseases.

b) The Sleep Disturbance Scale for Children (SDSC)<sup>(10-11)</sup> was completed by the parents and included aspects concerning their children's sleep patterns. The scale is composed of 26 items and a score from 1 to 5 is assigned to each according to the frequency of a given characteristic of the children's sleep. The total score ranges from 26 to 130 and the highest scores indicate poor quality sleep. For practical purposes this questionnaire's total score is divided into three factors: overall sleep (ranges from 26 to 130), excessive daytime sleepiness (sum of scores obtained in items 22, 23, 24, 25 and 26) ranging from 5 to 25, and breathing disorders (sum of scores in items 13, 14 and 15) ranging from 3 to 15.

c) PedsQL 4.0<sup>(12)</sup> Generic Core Scales: designed to measure pediatric quality of life. This inventory was translated and validated for the Brazilian culture in 2008 by Klatchoian et al.<sup>(13)</sup>. The following versions were used: for children between 2 and 4 years old, 5 and 7 years old, and for 8 to 12 year-old children. PedsQL 4.0 is a brief and easily applied

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instrument designed for use in communities, schools, and healthcare services. The PedsQL 4.0 is considered a multi-dimensional instrument able to assess different aspects of the daily lives of children and adolescents: 1) physical (8 items); emotional (5 items); social (5 items) and school functioning (5 items). It comprises 23 questions with equivalent items for all versions; only the language differs and is appropriate for each developmental phase. A four-point Likert scale is used for children and adolescents from 8 to 18 years old, while a three-point Likert scale is used for children 5 to 7 years old and is accompanied by a visual scale represented by happy, neutral and sad faces.

The items are reverse-scored and linearly transformed to a 0-100 scale (0 = 100, 1 = 75, 2 = 50, 3 = 25, 4 = 0) where higher values indicate better HRQOL. The instrument presents a physical summary component (equivalent to the final score of the physical domain) and the psychosocial score is obtained through the sum of the scores obtained in the emotional, social and school domains divided by the number of items contained in each of these domains. The instrument's overall score is equivalent to the sum of scores obtained in the domains, divided by the number of items answered.

d) The PedsQL Multidimensional Fatigue Scale: used to measure fatigue. This instrument was translated into Brazilian Portuguese by our team under the orientation of the original author<sup>(14)</sup> and is in its last phase of validation. Similar to the PedsQL 4.0 Generic Core Scales, different versions were applied to children in three different age groups (2 to 4 years old, 5 to 7 years old, and 8 to 12 years old). This questionnaire includes 18 questions divided into the following: overall fatigue, sleep-rest fatigue and mental fatigue. The items are reverse scored and linearly transformed to a 0-100 scale (0 = 100, 1 = 75, 2 = 50, 3 = 25, 4 = 0). Higher scores indicate lower levels of fatigue. The instrument's total score is equivalent to the sum of the scores obtained in each domain divided by the number of items answered. Evidence for the validation of this instrument is seen in a study in its final phase.

### Ethical aspects

The local Ethics Research Committee approved this study and all the caregivers authorized their children's participation (Process 0670/07). Prior to the application of the questionnaires, the researchers met with the school's principal and teachers (preschool and elementary school) to clarify the study's methodology.

### Statistical Study

The variables were initially descriptively analyzed. Spearman's coefficient for each was computed to evaluate the correlation between the HRQOL scores and those obtained on the sleep questionnaire. Student's t-test for paired samples was used to compare the averages of the domains of the PedsQL. Student's t-test was used for independent samples. The Kruskal-Wallis test was used for more than two groups. The level of significance was fixed at 5%.

## RESULTS

The sociodemographic characteristics and personal data of caregivers are presented in Table 1. We observed that 92.4% of the caregivers were the children's mothers, 67.9% worked full-time in the hospital, and 4.5% worked on the night shift. The 48.2% who did not have direct contact with patients included employees with administrative or support functions in the laboratory, kitchen, or laundry, and teachers, etc. We also verified that 63.5% of the caregivers reported adequate sleep, though 47.4% reported non-restorative sleep.

**Table 1.** Socio demographic characteristics and sleep patterns of the caregivers of children of health workers

	Number (n=249)	%
Primary caregiver		
Mother	230	92.4
Father	15	6.0
Grandmother/grandfather	3	1.2
Other	1	0.4
Age in years: average and range	38,5 (21 to 54)	
Age range		
≤ 30 years old	52	20.8
31 to 39 years old	114	45.8
≥ 40 years old	78	31.3
Not reported	5	2.1
Marital status		
Married	168	67.5
Separated	30	12.1
Widowed	7	2.8
Single	19	7.6
Other/not reported	25	10.0
Direct contact with patients		
Yes	129	51.8
No	120	48.2
Work hours		
Part time (morning)	48	19.3
Part time (afternoon)	19	7.6
Part time (night)	5	2.0
Full time	169	67.9
Other	8	3.2
Weekend duty		
Yes	58	23.3
No	191	76.7
Responsible for home chores		
Yes	173	69.4
No	76	30.5
Sleep patterns		
Adequate sleep hours		
Yes	158	63.5
No	91	36.5
Refreshing sleep		
Yes	131	52.6
No	118	47.4

Note: (n=249)

Table 2 shows the children's characteristics. Some of the children's habits draw attention due to their average age (5.6 years old): 62.2% watched TV in their bedrooms; 43.7% watched TV more than three hours a day; 50% used computer for more than four hours a day; only 27.8% took part in regular physical activities outside school.

**Table 2** – Demographic characteristics, lifestyle, sleep patterns of children of health workers

	Number (n = 249)	%
Gender		
Female	136	54,6
Male	113	45,4
Age in years: average and range	5,6 (2 to 10)	
Age range		
2 to 4 years old	100	40,1
5 to 7 years old	86	34,5
8 to 10 years old	63	25,3
Time spent at school		
Full time	122	49,0
Morning	89	35,7
Afternoon	38	15,3
Wake time during weekdays?		
Between 4am and 4:59am	19	7,8
Between 5am and 5:59am	97	39,6
Between 6am and 6:59 am	78	31,8
Between 7am and 7:59 am	31	12,7
8am or after	20	8,2
No information	4	1,6
Watch TV in the bedroom?		
Yes	155	62,2
No	94	37,8
How many hours TV watched per day?		
Up to 1 hour	40	16,0
1 to 2 hours	96	38,5
3 to 4 hours	84	33,7
More than 4 hours	25	10,0
No information	4	
Play videogames?		
Yes	58	23,3
No	191	76,7
Has a videogame system in the bedroom?		
Yes	33	13,3
No	216	86,7
How many hours of videogame play per day?		
Up to 1 hour	28	50,0
1 to 2 hours	21	37,5
3 to 4 hours	4	7,1
More than 4 hours	3	5,4
No information	2	3,4
Computer use?		
Yes	89	35,7
No	160	64,3
Has a computer in the bedroom?		
Yes	32	12,9
No	217	87,1
How many hours of computer use per day?		
Up to 1 hour	22	29,7
1 to 2 hours	11	14,9
3 to 4 hours	4	5,4
More than 4 hours	37	50,0
No information	15	16,9
Practice physical exercise regularly outside school?		
Yes	69	27,8
No	179	72,2
No information	1	

Note: (n = 249)

In regard to the children's sleep patterns, the overall average score obtained on the SDSC was  $45.8 \pm 12.2$  (ranging from 28 to 98), the average concerning excessive daytime sleepiness was  $9.4 \pm 3.7$  (ranging from 5 to 22), while the average concerning breathing disorders was  $4.9 \pm 2.6$  (ranging from 3 to 15).

The results concerning the PedsQL 4.0 and the PedsQL Fatigue Scale applied to the children and parents are presented in Table 3. The physical domain obtained the highest scores, followed by the social and school functioning domains. The scores for the emotional aspect were lower, especially from the children's perspectives (Table 3).

No statistical significance ( $p < 0.05$ ) was observed when the scores obtained on the PedsQL 4.0 and PedsQL Fatigue from the perspective of 5 to 11 year-old children were correlated with the scores obtained on the SDSC (quality of sleep). A negative correlation (Spearman's coefficient ranging from  $-0.201$  to  $-0.549$ ,  $p < 0.01$ ) was, however, observed when the scores obtained on the SDSC were correlated with the scores obtained from the PedsQL 4.0 and PedsQL fatigue from the parents' perspective (children 2 to 11 years old), indicating that worse quality of sleep may be related to a worse HRQOL. Table 4 presents comparisons between the parents' self-reported quality of sleep and the averages obtained by the children on the PedsQL 4.0, PedsQL Fatigue and the SDSC from the parents' perspective. Children whose parents reported having appropriate sleep patterns themselves presented higher average scores on the three questionnaires ( $p = 0.004$ ,  $p < 0.0001$  and  $p < 0.0001$ , respectively) when compared to children whose parents reported inappropriate sleep patterns.

When the children's habits (time spent watching TV, TV in the bedroom, use of videogames, extracurricular activities and exercise, and number of people sharing the bedroom) were correlated with the scores obtained on the PedsQL 4.0, PedsQL Fatigue and SDSC, a statistically significant correlation was observed only in relation to daily time spent watching TV ( $p = 0.0421$ ), even for those children who watched one hour per day ( $p = 0.0186$ ). Variations in the remaining habits did not show any relationship with HRQOL.

**Table 3** – Summary of the scores obtained on the PedsQL 4.0 generic core scales and the PedsQL Multidimensional Fatigue Scale from the perspective of children and caregivers

Scores	Average	SD	Minimum	1st quartile	Median	3rd quartile	Maximum	N
<b>Children</b>								
<b>PedsQL 4.0</b>								
Physical	90.3	8.9	62.5	87.5	93.8	100.0	100.0	149
Emotional	66.2	16.5	20.0	55.0	65.0	80.0	100.0	149
Social	78.9	17.5	30.0	70.0	80.0	90.0	100.0	149
School	78.6	14.1	40.0	70.0	80.0	90.0	100.0	149
Psychosocial	74.5	11.5	41.7	66.7	73.3	83.3	100.0	149
Total	80.0	9.1	54.3	72.8	80.4	87.0	100.0	149
<b>PedsQL Fatigue</b>								
Sleep	81.9	15.1	33.3	75.0	83.3	91.7	100.0	149
Mental	76.3	20.2	0.0	62.5	79.2	91.7	100.0	149
Total	77.5	16.8	33.3	66.7	83.3	91.7	100.0	149
<b>Caregivers/parents</b>								
<b>PedsQL</b>								
Physical	82.5	17.1	12.5	75.0	87.5	96.9	100.0	248
Emotional	74.1	17.2	20.0	60.0	75.0	90.0	100.0	248
Social	84.0	15.3	40.0	75.0	90.0	95.0	100.0	248
School	80.5	16.4	20.0	70.0	83.3	95.0	100.0	248
Psychosocial	79.5	13.1	32.7	71.2	80.8	90.0	100.0	248
Total	80.6	12.9	32.6	72.8	81.8	90.5	100.0	248
<b>PedsQL Fatigue</b>								
Sleep	83.4	13.9	37.5	75.0	87.5	95.8	100.0	246
Mental	81.8	18.2	25.0	70.8	87.5	100.0	100.0	245
Total	86.0	14.0	29.2	75.0	91.7	100.0	100.0	246

PedsQL psychosocial: physical + emotional + school functioning

SD: Standard Deviation

**Table 4** – Comparisons between the parents' self-reported quality of sleep and the averages obtained by children on the PedsQL 4.0, PedsQL Fatigue and SDSC from the parents' perspective

Caregivers' quality of sleep vs. PedsQL 4.0, PedsQL Fatigue and SDSC (parents' perspective)	Average of the questionnaire scores	DP	p-value
<b>PedsQL 4.0</b>			
Appropriate sleep	82.4	32.6	0.004
Inappropriate sleep	77.4	44.6	
<b>PedsQL Fatigue</b>			
Appropriate sleep	88.8	54.2	0.0001
Inappropriate sleep	81.1	29.2	
<b>SDSC</b>			
Appropriate sleep	43.1	28.0	0.0000
Inappropriate sleep	50.5	30.0	

PedsQL 4.0: "Pediatric Quality of Life Inventory 4.0", PedsQL Fatigue: d) PedsQL Multidimensional Fatigue Scale, SDSC: Sleep Disturbance Scale for Children, SD: standard deviation. Spearman's coefficient was computed to evaluate correlation between the scores concerning HRQOL and the sleep questionnaire.

Note: (n=249)

## DISCUSSION

The HRQOL of children of health professionals working in a university/tertiary hospital identified in this study was low, especially in psychosocial aspects. These findings draw our attention because the caregivers report a good educational level and are aware of the factors associated with healthy lifestyles.

In 2008 a study<sup>(13)</sup> assessed the HRQOL of 240 healthy children and adolescents in the city of São Paulo, SP, Bra-

zil aged between 2 and 18 years old attending a public school in the East area of the city. The reported PedsQL 4.0 scores were higher in all domains (physical, emotional, social and school) compared to this study's results, both from the perspective of children (5 to 11 years old) and of parents. This difference was even more significant in the social domain and from the children's point of view (93.1 vs. 78.9).<sup>2</sup> The social domain in the PedsQL 4.0 measures the inter-relationships of children with other children the



same age, whether daily at school or in play activities. The domain with the second lowest scores was the emotional domain (73.0 vs. 66.2), which assesses feelings such as fear, sadness, anger, and concerns in general. This is a significant finding because the HRQOL of two groups of apparently healthy children from medium class families and studying in public schools were measured. There are, however, characteristics that differ between the two groups. The first difference concerning the children addressed in this study is the distance between their homes and the school. They live far away from school and for this reason spend more time commuting. Another aspect is that they usually spend more time at school than the usual four to five hours for a common public school, since they wait for their parents to complete their work hours. We believe that such a routine restricts the quality and time available for leisure, as well as socialization with other children the same age living in their community.

In the same study<sup>(13)</sup>, the authors measured the HRQOL of children with chronic rheumatic diseases such as juvenile idiopathic arthritis and juvenile systemic lupus erythematosus. These patients presented a low average score ( $65.9 \pm 22.4$ ) in the emotional domain, similar to the score obtained by the public school's children ( $66.2 \pm 16.5$ ). This is relevant information considering that healthy children experience a considerable level of stress and/or anxiety.

Many of this study's children present inappropriate habits, such as excessive exposure to TV, video games, and computers. A statistically significant correlation was observed between time of exposure to TV and HRQOL. Children who spent three hours a day watching TV presented lower HRQOL scores. It is worth noting that many current studies show a positive relationship between inappropriate habits, sedentariness and obesity<sup>(13-17)</sup>. It is known that stress associated with the work of health workers is greater than that of other workers, as is responsibility and exhaustion. Even though these aspects were not compared with the children's habits, we infer that health workers have less time to play with their children, since many (69.4%) also perform home chores in addition to their professional activities. It is also worth mentioning that studies have shown there may be a correlation between watching TV in excess and psychosocial problems such as anxiety, depression, and violent behavior<sup>(18-19)</sup>.

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There is a positive correlation between the children's quality of sleep (SDSC) and the HRQOL/fatigue in children ( $p < 0.01$ ) from the perspective of parents. In 2004, researchers<sup>(4)</sup> studied the correlation between lifestyle and the HRQOL of 7,887 Japanese children aged between 12 and 13 years old and observed that not having breakfast, having little exercise, watching TV for long hours and going to bed late were associated with a worse quality of life, especially in the physical and emotional domains, regardless of gender and social profile. Some studies show that inappropriate sleep (sleeping late/getting few hours of sleep) is related to behavioral changes<sup>(20-22)</sup> such as mood changes, depression, anxiety and impaired learning. Parents and educators should always be advised of this situation that may be aggravated as the child grows and develops. It is known that sleep disorders are very prevalent among adults, for both genders, causing problems at various levels from personal to professional areas.

## CONCLUSION

This study's results showed a positive correlation between the parents' self-reported quality of sleep and their children's HRQOL and sleep patterns (measured by the PedsQL 4.0, PedsQL Fatigue and the SDSC). It is known that children incorporate the habits of parents over the first years of life; thus arises the importance of parents being a healthy model, which is not always possible due to the current routine of most families of health workers.

The scores obtained by the children of health workers on the HRQOL were low, especially from the perspective of the children. Correlation among the children's worse quality of sleep and worse HRQOL and their habits was observed; that is, there was a correlation among the PedsQL 4.0, PedsQL Fatigue and SDSC and the time children spent daily watching TV. Children who spent more time watching TV also obtained lower scores in the questionnaires.

Data presented here portray a reality experienced by physicians, nurses and other health workers, whose occupational characteristics influence the routines of families as a whole. We expect these results, which reflect an old and well-known problem, will encourage discussions between parents and educators in order to improve the quality of life of these children in the future.

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