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Original Research Article

Vulnerability to infectious and contagious diseases in daycare center teachers: an observational study

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ABSTRACT

Background: The risks caused by infectious and contagious diseases in the school environment are of importance to the conduct of early childhood education in the contemporary world. In this work authors aimed to analyze vulnerability to infectious and contagious diseases in daycare center teachers who work in public institutions in the Municipality of Fortaleza-CE, Brazil.
Methods: This was aquanti-qualitative study approach of the descriptive, cross-sectional type, of an exploratory nature. This study was carried out with 30 daycare center teachers from the Municipality of Fortaleza from October to November 2016.
Results: The main infectious and contagious diseases that affect children in the daycare center were high rates of two or three comorbidities per child. Regarding the workplace risk to the teachers' health, 58.6% of the teachers consider that the working in the daycare center does not bring greater risks of illness and 41.4% believe it does.
Conclusions: Stress due to the presence of students with viral infections who need to remain in the daycare center, lack of hygiene, rest and inadequate nutrition contribute to the vulnerability to illnesses in the teachers.

Keywords: Contagious diseases, Daycare Center, Infectious diseases, Teacher, Teaching Work, Vulnerability

INTRODUCTION

The risks caused by infectious and contagious diseases in the school environment are of importance to the conduct of early childhood education in the contemporary world. Sociopolitical, economic and cultural transformations experienced by women and families since the nineteenth century with the Industrial Revolution and compounded during the last century have definitively engendered women's entry into the workforce.[1,2] Early childhood education, or in the first years of life, is experiencing a growing expansion in distinct strata of society, with an increase in educational institutions, since children need to attend school at an increasingly earlier age.

In this way, women and families share the care and education of their young children with daycare centers and pre-school. In this context, the teachers in daycare centers play a fundamental role, to the extent that the current society considers and seeks these schools as places of care and education of very young children, and therefore it is necessary to provide adequate working and health conditions so that they may carry out their work as educators/caregivers.[1]

Many parents have questions about daycare center policies when their children are ill and have doubts about whether or not to send their sick children. School outbreaks can occur with various diseases from respiratory infections to diarrhea outbreaks, fungal and parasitic infections, among others, including a diversity of infectious agents.[3-7]

There is an increased risk for the acquisition of infectious diseases associated with out-of-home child care and the effectiveness of control measures for the prevention of disease transmission in daycare centers and pre-schools.[8,9] The health of daycare center teachers has been the subject of few studies, which seems to add to the undervalue faced by professionals with training in pedagogy who work with child education.[10] Added to this is the feminization of labor in this educational field, and there is a double burden for these professionals.

In the collective health tradition, vulnerability studies seek to understand how people and groups are exposed to health problems, considering three dimensions: the individual dimension, which refers to aspects such as biological, behavioral and affective factors that interfere with health and well-being; the social dimension, which involves the factors of exposure and susceptibility to health problems in relation to socially configured contexts and relationships that determine those aspects; and the programmatic dimension, that is, policies, programs, services, actions aimed at interfering with these situations.[11,12]

In this work, authors intend to evaluate the vulnerability of teacher in catching infectious and contagious diseases in daycare center associated to the working conditions in the Municipality of Fortaleza, the state capital of Ceará, northeast of Brazil.

METHODS

A quanti-qualitative study approach of the descriptive, cross-sectional type, of an exploratory nature.[13] The study was carried out with the teachers who work in daycare centers and/or the Child Education Center (CEC) of the Municipality of Fortaleza, the state capital of Ceará, from October to November 2016. As a general rule, the Municipality administers 106 CECs and 51 exclusively public daycare centers, which take care of children of toddlers and pre-school (one to five years) children, distributed among the six regional executive offices (SERs) (Table 1).

Teachers older than 18 years of age, of both sexes, who taught children up to 5 years old in the city of Fortaleza, CE, were included. Authors excluded teachers who did not fulfill the inclusion criteria and who chose not to participate in this study.

Table 1: Distribution of daycare centers and/or child education centers in the municipality of Fortaleza, CE, Brazil (October 2016).

Regional	Type	Quantity	Total
I	CEC	18	22
	Daycare	04	
II	CEC	16	23
	Daycare	07	
III	CEC	09	21
	Daycare	12	
IV	CEC	23	31
	Daycare	08	
V	CEC	19	31
	Daycare	12	
VI	CEC	21	29
	Daycare	08	

One hundred teachers from two Regionals - SER III and SER IV participated in this study and were chosen by lottery. There are 9 CECs and 12 daycare centers located in SER III, and 23 CECs and 8 daycare centers in SER IV. The data were collected through the application of a questionnaire, consisting of ten closed-ended questions and three open-ended questions, which gave room for subjective answers from the teachers who accepted to participate in the experiment.

For the analysis, the program used was Stata version 11.0. Quantitative variables were expressed by absolute and relative frequency. Authors used quantitative variables, with a normal contribution (Shapiro-Wilk, $p > 0.05$) to describe mean, minimum and maximum standard deviation. Student's t-test was applied to analyze the association between the characteristics of the teachers' work with satisfaction and disease occurrence due to teaching in the daycare center. Finally, the Pearson Test was performed to evaluate if there is a correlation between the characteristics of the teachers' work and the number of times, they became ill this year. For all analyzes, the confidence level was 95%. Subjective information, pertinent to a qualitative analysis, and were submitted to Thematic Content Analysis, modified by Bardin.[13] This research aimed to achieve the ethical rigor based on Resolution numbers 466 of 2012 and 510 of 2016 that determine the observation of ethical guidelines that must be respected in research carried out with human beings. In this work, a sample of non-probabilistic convenience was used.

RESULTS

Thirty daycare center teachers answered 30 of the 100 questionnaires that were distributed. All participants were female (30). Regarding training, 53.3% (n=16) have graduate degrees; 36% (n=11) graduated with a degree in pedagogy; 6.6% (2) have other educational training and 3.3% (n=1) have technical pedagogical training. As for entering the daycare center; 50% (n=15) by public tender

and 50% (n=15) through other types of contracts. The great majority stated that they did not eat food from the daycare center 86.7% (n=26); likewise, 58.6% (n=17) state that being a daycare teacher does not make them more fall ill and 86.7% (n=26) are happy in their jobs. When authors inquired about the frequency of diseases in the children, authors noticed that 26.7% (n=8) of the children suffered from one comorbidity, 33.3% (n=10) had two, 30% (n=9) had three and 10% (n=3) more than three comorbidities (Table 2).

Table 2: General profile characteristics of the teachers (n=30) in public daycare centers of SER III and IV of the municipality of Fortaleza, CE, Brazil, in 2016.

Characteristics	N	%
Training		
Technical daycare worker	1	3.3
Pedagogy	11	36.6
Graduate	16	53.3
Other	2	6.6
How did you enter the daycare center?		
Public tender	15	50
Others	15	50
Do you eat food from the daycare center?		
No	26	86.7
Yes	4	13.3
Do you think that being a daycare teacher makes you fall ill?		
No	17	58.6
Yes	12	41.4
Are you satisfied with your job?		
No	4	13.3
Yes	26	86.7
Which diseases do you most commonly observe in the children at daycare?		
1 comorbidity	8	26.7
2 comorbidities	10	33.3
3 comorbidities	9	30
More than 3 comorbidities	3	10

The teacher most recently employed at the daycare center has been working for six months, the one working for the most has been there for 12 years (144 months), with a mean (χ) of 37.4 months in service time with standard deviation (SD) 37.8. Regarding the weekly workload, one teacher works 20 hours week (minimum value) and another one with a 45-hour weekly load (maximum value), χ of 38.5 (SD=6.6) hours per week. The lowest number of students who were enrolled in one of the daycare centers surveyed was 28 children, while the daycare center with the largest number received 268; χ was 93.5 of students (SD=41.5) per daycare center. The number of students per teacher varied from eight children (minimum value) to 26 children (maximum value), χ was 18.9 children (SD=3.8). Regarding the health of the participants, in the year 2015, nine did not report any illness and only one teacher reported having fallen ill 14 times during the same year; χ was 2.9 times (SD=3.3) per teacher. In 2016, 5 teachers did not report any illness, while one of the professionals surveyed convalesced nine times, χ was 2.4 per person (SD=1.9). Among the teachers interviewed, 58.6% (n=17) believe that being a daycare professional does not cause illness, as opposed to 41.4% (n=13), who said they did. The most commonly reported diseases were: flu, mycoses, and afflictions related to body posture. The average time of the teachers satisfied with their work was χ of 38.7 months and the teachers who said they were dissatisfied, χ was 28.5 months. The total number of students attending the daycare centers of the teachers satisfied with their work was χ of 95.1 and those who said they were dissatisfied were χ of 84.5 students. The teachers who satisfied with their work attended χ of 18.8 students and the dissatisfied, χ was 20.0 students. The weekly workload of those who are satisfied with their jobs was χ: 38.8 hours per week and the teachers who said they were dissatisfied was χ of 40.0 hours per week. In the present year, the number of sicknesses in those who are satisfied with their jobs was χ of 2.3 sicknesses and of the teachers who said they were dissatisfied was χ of 2.5 sicknesses. In the year 2015, the number of sicknesses in teachers who said they were satisfied with their jobs was χ of 2.4 sicknesses; and of those who said they were dissatisfied was χ 5.2 sicknesses (Table 3).

Teachers who think that working in a daycare center can cause them to fall ill more frequently were those with χ of 33.7 months and those who answered that they did not 40.8 months working in the daycare center. The number of students of teachers who think that working in a daycare center could cause them to fall ill more often was χ: 85.3 students and teachers who answered that it did not was χ: 102.6 students. The number of students per teacher of those who think that the daycare center can cause them to fall ill more frequently was χ: 20.0 students and the teachers who answered that it did not was χ 18.4 students. The weekly workload of the teachers who think that the nursery can cause them more illnesses was χ 40.7 hours a week, and those who answered it did not was χ of 36.7 hours a week. In the current year, the number of people who fell ill of those who think that the daycare center can cause them more diseases was of χ 3.4 sicknesses; and of those who said it was not was χ 1.5 sickness. In the year 2015, the number of people who fell ill of those who think that the daycare center can cause them more diseases was of χ 5.4 diseases; and the teachers who said it was not was χ 1.1 sickness. In the last two analyzed variables, authors found distinct means with statistically significant differences. The average number of teachers who fell ill in both 2015 and 2016, who believe that being a daycare teacher causes them more illness, was higher than the average number of teachers who responded they did not believe this was the case when questioned (Table 4).

Pearson's correlation coefficient was applied between the number of times the teacher fell ill in 2015 and other four

variables surveyed (Table 5). Therefore, among the four variables, the weekly workload is the one that most strongly correlates with the number of sick leaves. That which most "weakly" correlates are the total number of daycare students.

Table 3: Labor characteristics of public daycare teachers according to their satisfaction with their jobs and number of times they fell ill, SER III and IV Fortaleza / CE, Brazil (2015-2016).

Variables	Job satisfaction		P*
	Yes	No	
	Mean (CI95%)		
Time working at daycare (months)	38.7 (23.0; 54.6)	28.5 (-19.2; 76.2)	0.621
Total n. of students at daycare	95.1 (76.5; 113.6)	84.5 (28.6; 140.3)	0.648
No. of students per teacher	18.8 (17.0; 20.4)	20 (20.0; 20.0)	0.555
Weekly workload	38.3 (35.4; 41.1)	40.0 (40.0; 40.0)	0.636
No. of times teachers fell ill/year	2.3 (1.4; 3.2)	2.5 (1.0; 4.0)	0.869
No. of times teachers fell ill in 2015	2.4 (1.3; 3.5)	5.2 (-4.5; 15.1)	0.120

*Student's t test; CI95%: Confidence interval 95%.

Table 4: Association of the labor characteristics of the teachers of public daycare centers, according to the occurrence of diseases, SER III and IV of Fortaleza / CE, Brazil (2015-2016).

Variables	Being a daycare center teacher causes you to fall ill more?		P*
	Yes	No	
	Mean (CI 95%)	Mean (CI 95%)	
Time working at daycare (months)	33.7 (16.0; 51.2)	40.8 (17.6; 63.9)	0.629
Total no. of students at daycare	85.3 (65.5; 105.2)	102.6 (78.4;127.0)	0.291
No. of students per teacher	20.0 (20.0; 20.0)	18.4 (15.8; 21.0)	0.284
Weekly workload	40.7 (39.7; 41.8)	36.7 (32.2; 41.3)	0.119
How many times did you fall ill in 2016?	3.4 (2.0; 4.9)	1.5 (0.7; 2.3)	0.012
How many times did you fall ill in 2015?	5.4 (2.8; 7.9)	1.1 (0.3; 2.0)	0.001

*Pearson's correlation.

The same analysis was performed between the number of times the teacher became ill in the current year with the same four variables (Table 6). Therefore, of the four variables, the weekly workload is the one that most strongly correlates with the number of sick leaves in 2016. And that which most "weakly" correlates are the number of students per teacher.

Table 5: Correlation of the labor characteristics of public daycare teachers with the number of times they fell ill, SER III and IV of Fortaleza/CE, Brazil (2015).

Variables	How many times did you fall ill in 2015?	
	r	P*
Time working at daycare (months)	- 0.126	0.530
Total no. of students at daycare	0.022	0.918
No. of students per teacher	0.174	0.396
Weekly workload	0.277	0.170

At this point, it is necessary to emphasize the fact that the teachers, for the most part, lack a certain bodily awareness, that is, do not perceive the accumulation of physical exhaustion, neither do they see what care is needed in relation to themselves nor collectively claim working conditions that favor better care in this direction.

Table 6: Correlation of the labor characteristics of public daycare teachers with the number of times they fell ill, SER III and IV of Fortaleza/CE, Brazil (2016).

Variables	How many times did you fall ill in 2016?	
	r	P*
Time working at daycare (months)	- 0.227	0.236
Total no. of students at daycare	0.195	0.338
No. of students per teacher	0.087	0.658
Weekly workload	0.385	0.043

*Pearson's correlation.

DISCUSSION

The illnesses in teachers resulting from the work carried out in daycare centers in the Municipality of Fortaleza are related to the physical proximity between teachers and children and to the daycare environment. The

vulnerability of teachers to illnesses due to their work in the daycare center were flu, lice and mycoses resulting from contact with children from the time of arrival in school with the reception of the child by the teacher who receives and embraces it. Besides the transmission of infectious and contagious diseases, the teachers also reported that the sick child taken to the daycare centers interferes with the classroom routine, there is a context of work overload. In Japan, sick children are not accepted in conventional daycare centers and parents are required to take their children to the daycare center specialized in caring for sick children. In England, factors influencing decision-making to take children to daycare are related to the symptoms and also to the financial and labor penalties that may be incurred as a result of their own absences at work. Parents have doubts about whether or not they should take their sick children.[3]

Other factors contribute to the risk of contracting diseases in schools for young children, for example, the shortage of hygiene material for the children and the absence of systematic guidance from employees and families. Simple measures such as hand washing reduce the risk of infections of the respiratory tract, gastrointestinal tract and consequently decreased student absenteeism.[15-17]

In Germany, it has been observed that work rewards (effort-reward imbalance) are an important factor in diseases that affect skeletal muscles and in Burnout Syndrome in nursery schoolteachers. ERI was revealed to be an important factor in relation to MS and burnout in childcare workers.[18] In Denmark the average number of students per teacher is 2.82 and it was found that absenteeism in that group of teachers was directly related to the number of students.[19] The more students per teacher the higher the annual absenteeism index. In Fortaleza 18.4 students per teacher, however, authors observed that the number of students was not directly related to the number of times the teachers fell ill, but instead, the higher the weekly workload, the more health intercurrences were reported. Recurrent factors during the interviews were associated with working conditions, to lack of treatment and guidance for parents and daycare staff, and lack of treatment in the case of illness.

CONCLUSION

The reality of magisterium and the precarious conditions of this line of work in, when confused with kinship and maternity, evidences the exploitation of women's labor in Brazilian society and the lack of health monitoring of those responsible for educating and caring for young children. Mycoses, parasitic and postural diseases, constant colds and flu, skin diseases, fungi and lice, constitute a precarious condition of space and hygiene to which the teachers are subjected in their jobs.

Work overload influenced the number of times the teachers fell ill. Other studies in this field of knowledge are important in relation to the discussion in Collective Health. The subject under study needs other perspectives, both in the field of health, as in the fields of education and public policy.

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