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Absenteeism, turnover, and indicators of quality control in nursing care: a transversal study

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ABSTRACT

Aim: to analyze the indexes of absenteeism and turnover, and their relationship with quality indicators in assistance. **Method:** this is a transversal study, performed with records of absences/changes of 59 nursing professionals of an intensive care unit; records of quality/incidence indicators, and medical records of the 108 patients hospitalized during the period of data collection. The coefficient of linear correlation was used among the indicators of assisting management and quality control. **Results:** the average rate of absenteeism was 9.41% (of nurses) and 12.52% (of technicians); turnover rates reached 2.53% (nurses), and 3.57% (technicians). There was a strong correlation ($r>0.7$) between: turnover of nurses and the incidence of accidental extubation ($p=0.464$); rate of absenteeism among technicians and the loss of nasoenteral tube ($p=0.300$); pressure injury ($p=0.100$) and loss of central catheter ($p=0.200$), which was also correlated with the rate of absenteeism of nurses ($p=0.113$). **Conclusion:** the results demonstrated can subsidize new approaches for the management of personnel and better assistance, aiming to reduce the damages to the patient.

Descriptors: Absenteeism; Intensive Care Units; Quality of Health Care.

INTRODUCTION

The analysis of quality in health care, in special in Intensive Care Units (ICU), is considered a significant challenge due to the care provided, the profile of the patient under constant hemodynamic alterations, and the imminent risk of death. Such characteristics demonstrate care procedures of high complexity and trained and capacitated staff to provide non-stop care, which requires clinical and administrative decisions supported by knowledge and experience.

It is seen the growing preoccupation of nurses related to the construction and the validation of indexes, aimed to derive the quality of assistance provided, as they are comparable among each other in intra and extra-institutional levels, and that are a reflection of the different context found in professional practices[1]. To guarantee the quality of the care provided by the nursing team, there are indicators to evaluate the quality of the services of the nurses inside the hospitals[2,3]. The construction of indicators is being characterized as a strategy that generates a search for effectivity and effectiveness under organizational structures, work procedures, and in the results of the assistance provided.

The indicators are instruments that can define parameters to perform comparisons and to aggregate value judgment towards the result found and the standard set, and based on such information it is possible to evaluate failures and to propose solutions[4]. The indicators of human resources management, and among these, the absenteeism and the turnover, are used to monitor the quality of assistance provided, and are presented as an issue to be observed, as they interfere in patient's care, which can overload the other members of the team and lead the professional to become ill. In nursing, absenteeism and personnel turnover deserve special attention, in special in the uninterrupted operation services that demand the constant presence of the nursing team, once the reduced team puts the quality of the assistance provided to the patients at risk, in both supporting the hospitalization of adults and children[5,6].

Conceptually, absenteeism refers to the frequency or time loss of working shift when professionals are not present in their workstations, which correspond to the absences when they were expected to be present. Examples are absences, medical leaves, participation in training and development programs, among others[7].

The study of absenteeism in nursing is relevant to subsidize the planning and adequacy of human resources, considering the characteristics of continuity of the nursing workload over the 24 hours of activities in a hospital, for example[8].

The turnover, on the other side, can be understood as the flux of admission and dismissal of workers in an organization. The etiologies of the absenteeism and of the turnover are related to the working conditions, such as the lack of resources and safety equipment, leadership and control styles, lack of integration between laborers and the fragility of employment bonds, thus situations that can interfere in the quality and safety of the assistance provided[9].

The quality in the health services are part of the organizational policies and goals, aimed to an assistance supported by the assumptions of users' and professionals' safety and satisfaction[10].

The ideas presented lead us to search for answers of the following questions: what is the impact of absenteeism and turnover in nursing in the quality of the assistance provided in an ICU? Which are the correlations between the indicators of human resources management, and of those of safety?

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AIM

To analyze the indexes of absenteeism and turnover, and their relationship with the standards of quality in patient's care in an ICU.

METHOD

This is a transversal study, with a quantitative approach and as object study the rate of absenteeism and turnover in an ICU of a school hospital, which is also public and of universal access, tertiary level, located in the Brazilian city of Fortaleza. The hospital considered the largest in the Brazilian state of Ceará, providing services for the local population, and due to its referential position and complexity of the services, it also supports neighboring states in different areas of specialized health.

The ICU under examination is composed by three areas equipped for the treatment of critical patients, from both different wards of the hospital and from the emergency room. The first area, the ICU 1, has 16 beds for clinical patients, the ICU 2 has eight beds destined to surgical patients, and the ICU 3 has 14 beds divided for neurosurgical patients and for medical clinical patients. Each area has a coordinating nurse, assisting nurses, and a manager nurse.

Data collection occurred during the months of February, March, and April 2016, using an instrument such as a checklist, observing the frequency records of the nursing team.

The population of this study was composed by nurses and nursing technicians who were working in the schedules, in a total of 32 nurses and 38 nursing technicians/assistants, distributed between cooperated professionals (COPEN/CE), official professionals from the State Health Department (SESA/CE) and from the Federal Ministry of Health (MS). The criteria of inclusion used were: working in the morning and/or night shift of the intensive care unit, and working in the institution for at least one year.

From the survey performed, it was defined a finite population of 70 nursing professionals. The sample was calculated according to the formula of finite population sample, considering the prevalence of 50% and a sampling error of 5%.

$$n = \frac{t^2 5\% \times P \times Q \times N}{t^2 5\% \times P \times Q + (N-1) \times e^2}$$

Where: n is the sample; **'t'** is the value of distribution of t student, or level of significance (t=1,96); P is the prevalence of the phenomenon (here considered in 50%); Q is the complementary percentage of P (Q=100 - P); N is the population; and '**e'** represents the sampling error (here considered in 5%). Thus, it was reached the number of 59, which is the total sample of the research.

In a first moment of analysis, it was calculated the absenteeism and the turnover through the observation of the records of absences and changes of professionals between the wards of the hospital. The second moment of analysis was mediated and performed by the use of the information generated by the documents present in the workplace (instrument for recording the indicators of quality/ incidence and patient's medical records). These quantitative data were analyzed through simple statistical descriptive analysis and were presented in charts.

The number of studied medical records was the total number of hospitalized patients during the moment of research, which was 108 individuals, together with the adverse event occurrence records, thus generating the indexes of analysis of the ICU during the

months of study. To build the sample of medical records, the following criteria was defined: medical records of patients who are 18 years old or above, under clinical and/or surgical treatment, and hospitalized between February and April 2016.

The statistical analysis was directed to verify the correlation between the indicators of human resources management (turnover and absenteeism) and the indexes of quality of patient's care (non-planned extubation of the endotracheal cannula, incidence of accidental removal of nasogastric/enteral tube – NGET, incidence of skin injuries – SI, and the accidental loss of the central venous catheter – CVC). To be able to calculate these elements, it was used Pearson's Linear Correlation Coefficient, with the following referential values: $r \geq 0.70$ for a strong correlation; $0.3 \leq r < 0.7$ for a moderated correlation, and $r < 0.3$ for a weak correlation. The level of significance was defined in 5%.

The project of research was approved by the Committee of Ethics in Research of the Ceará State University (protocol #1.294.189/15), and had the approval term by the institution selected to be researched. It is part of a multidimensional study, in a broader approach, called "Safety in the management of nursing care: a focus on the types of errors and adverse events related to health care".

RESULTS

The analysis of absenteeism rates was performed by nursing category of the ones investigated. It can be seen that the rates for professionals of technical/high school levels are larger than those of college level, as seen on chart 1:

From the numbers found, it was observed that the average absence of the nurses during the month was 9.41%, a level above the acceptable rate as described on the COFEN resolution #293/04, which established the value of 6% as a yardstick. In addition to that, the level of absenteeism of nursing technicians during the month of March, over the three units, reached an average of 9.93%. Indexes above these values need an attentive analysis in order to adopt health promotion measures and prevention to aggravation of laborer's health.

The indicator of turnover of professionals is relevant for human resources management, as it implies in a bond with the role and with the team. The values related to this index of the ICU are found in the chart 2. The turnover of professionals of the nursing team evokes a predisposition of patients to risks, once it interferes in the process of development of the laborer, impeding the continuity of the training offered.

Chart 1 - Absenteeism rates of the nursing team in the ICU in February, March, and April 2016. Fortaleza, Brazil (n=59)

	ABSENTEEISM RATES											
	ICU 1			ICU 2			ICU 3			AVERAGE		
	Feb	Mar	Apr	Feb	Mar	Apr	Feb	Mar	Apr	Feb	Mar	Apr
Nurse	2.28	11.90	4.21	2.92	7.15	4.18	4.46	9.18	3.87	3.22	9.41	4.09
Technician	7.40	13.80	4.75	9.93	11.13	4.15	2.26	12.63	4.96	6.53	12.52	4.62

Source: direct research

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Chart 2 - Values of monthly turnover indicated for the nursing team at the ICU in February, March, and April 2016. Fortaleza, Brazil (n=59)

	TURNOVER INDEX		
	February	**March**	**April**
Nurse	0	1.72	2.53
Technician	2.38	3.57	3.27

Source: direct research

The understanding of the behavior of professionals regarding these variables and the constitution of compatible indexes to each reality found demonstrate the quantitative of workers that must be added to the general framework of workers of a certain professional category to cover the absences, as well as necessary steps to reduce the indexes found.

Meaning of indexes of quality of patient's care in human resources management

At the studied unit, some quality indicators are adopted to assist in managerial activities. The calculations of the indexes were performed according to the standards of the Nageh Handbook of Indicators [1]. Among those, there are: the incidence of non-planned extubation of the endotracheal cannula, incidence of the loss of NGET, incidence of SI, and incidence of loss of CVC. It was observed that the values referred to the period of data collection are significant specially for the event of loss of NGET and SI, according to chart 3.

It was considered the removal of tubes by the patient himself or by the accompanying person, in situations during manipulation or transportation, not planned exits under clinical situations (nausea, vomiting, and coughing), and were excluded the open tubing and other uses different from nutritional support, obstruction, and problems related to the material used (breaking, drilling, among others). The number of hospitalizations and exposition of patients varies every month.

Chart 4 presents the correlation between indexes of human resources management (turnover index and absenteeism index), and of quality in patient's care (non-planned extubation of the endotracheal cannula, loss of NGET, SI, and loss of CVC).

Therefore, it is observed that there was a moderate and positive correlation between the indexes of technicians and the index of incidence of loss of CVC (r=0.659), however, statistically it was not significant (p>0.05). there was a strong correlation, however statistically not significant, between the turnover index of nurses, and the incidence of non-planned extubation of the endotracheal cannula (r=0.746; p>0.05). it was found that the correlation was inversely proportional between the turnover index of technicians and nurses, and the incidence of loss of NGET. Other indicators presented moderate or weak correlation.

Chart 3 - Calculation of quality indexes and their distribution according to the nature and frequency of ICU, during the months of February, March, and April 2016. Fortaleza, Brazil (n=108 Total)

Index	**Quantitative**			**Calculation of the index %**		
	FEB	**MAR**	**APR**	**FEB**	**MAR**	**APR**
Incidence of non-planned extubation of endotracheal cannula	2	5	7	7.14	19.2	26.9
Incidence of non-planned output of oro/nasogastroenteral tube for nutritional support *	2	5	4	12.06	23.8	26.6
Incidence of skin injury	6	9	7	16.6	25	19.4
Incidence of loss of central venous catheter	8	9	9	25.8	29.03	25.0
Total	18	28	26			

Source: direct research. 2016

Chart 4 - Correlation between indexes of human resource management, according to professional category, and indexes of assisting quality in the ICU. Fortaleza, Brazil, 2016

Variables	Incidence of non-planned extubation of endotracheal cannula		Incidence of loss of nasogastric/ enteral tube		Incidence of skin injury		Incidence of loss of central venous catheter	
	r	p	r	p	r	p	r	p
Turnover index								
Technicians	0.275	0.823	-0.065	0.959	0.245	0.842	0.659	0.542
Nurses	0.746	0.464	-0.588	0.600	-0.311	0.799	0.155	0.901
Absenteeism index								
Technicians	-0.075	0.436	0.891	0.300	0.988	0.100	0.951	0.200
Nurses	-0.385	0.760	0.572	0.612	0.797	0.413	0.984	0.113

r=correlation of Pearson; p=statistical significance
Source: direct research

It was seen a strong correlation between the absenteeism index of technicians with all quality indexes mentioned, however with a 'p' value that was not significant. Concerning to the absenteeism index of nurses, it was observed a strong correlation with the events of SI and loss of CVC, with p>0.05. All others presented moderate correlation. It is valid to highlight the inversely proportional correlation between the absenteeism indexes, and the incidence of non-planned extubation of endotracheal cannula.

DISCUSSION

The Recommendation #171 and the Convention #161 of the International Labor Organization (ILO) show the importance to record the reasons for absences, in order to understand their dimensions, determinations, and causes to propose solutions[11].

It is believed that the absenteeism rates found in the unit represent disorders for the organization of workers, and as a consequence, for the assistance provided to the patient, besides generating a work overload, which, in turn, can generate the illness to the laborers[12].

The argument is that there is a minimal reduced number of absences in organizations[12]. Whichever the minimal index used to observe the phenomenon, it works to create a standard to the database and indicate solutions to the problem, or in other words, to detect the causes, and if the sources of the problem are seen under the spectrum of the abilities or effectiveness of policies, it is possible to plan counter-control measures. Among the main causes of absence from work of nursing professionals, the most mentioned are illnesses related to the osteo-muscular system, resulted from the working processes of the team, which involves changing the position of patients, bed bath, transportation of patients from the bed to the stretcher for examinations, proceedings, and transfers, among other activities[8,5,13].

According to the data presented, when relating the variable absenteeism and the professional category, it is evident that workers with high-school level or below are more absent from work than those with college level. Other studies[5,13] reached the same conclusion.

In regards to turnover, it is seen a considerable percentage of nursing professionals without labor bonds with the institution, and in the case of the workers linked to nursing cooperatives, the turnover is a challenge to manage care, and as a consequence, its quality. Besides that, the exit of a professional who was trained and has

experience in health services is not only harmful to the institution, which invested resources in the professional, but also generates a feeling of discontent among the team, due to the overload of tasks into the other members[6].

The results found in this study related to the turnover of nurses corroborate with scientific evidences found in other researches. A study[12] in Canada showed that 22.5% of the nurses interviewed demonstrated intentions to leave the area in the following year. Besides that, it demonstrated that the satisfaction and the exhaustion of nurses was associated with the intention of leaving, with favored the turnover in the ward. the elements that generated largest unsatisfactory remarks by the interviewees and consequent desire to leave the ICU was low salary, nurse-patient relationship, the nursing team, and the working environment.

These gaps are explained by the fact the nursing professionals are the majority among the health professionals in a hospital and are present in most tasks that involve considerable risks to themselves, and in some cases, which are also difficult to be applied[13].

In a systematic review designed to identify evidences in the influence of nursing workload over adverse events, it was found that 75% of the studies demonstrated an influence of the overload into the cases of infection, injury due to pressure, and use of medication[14].

Into health institutions, the organization of the work of the nursing team is essential to an adequate and quality care to the patient. Considering the context of work processes at the ICU, where there is a predominance of complex roles, tasks that demand technical-scientific abilities and knowledge due to the care that demand permanent attention and larger workload from the nursing team, once there is the necessity to guarantee an adequate number of laborers to ensure the quality in care for 24 hours a day[15].

It is known that the evaluation of service quality in health institution must be focused in three aspects considered important: the structure, the process, and the results. always trying to find the elements that affect negatively the results, which from those, it will be possible to take steps that can generate behavioral and managerial changes, stimulating the compromise of professionals and managers towards the quality in health care[16].

In regards to the frequency of the safety index, it was seen a predominance of incidence related to NGET and SI. In the records, the main factors associated to the loss of NGET found were the poor fixation of the tube, bed bath, and the removal of the tube by the patient himself. In regards to the SI, besides the rates presented in the chart 3, it is seen that the ICU patients, during the months of March and April, with previous medical picture of whole skin, 16 (2.6%) were found with SI in some place. it is important to mention that these numbers do not include the patients who were admitted with some SI and these injuries were aggravated during hospitalization.

The loss of a tube is a relevant indicator that aims to identify the main causes of the loss of gastroenteral tubes, so to build, together with the team, strategies that may avoid successive and unnecessary probing. In a study[3] performed in hospitalization units, semi-intensive units, and ICUs, it was found an average of 57.6% of incidence of nasogastric/enteric tube loss, and the main reason the accidental removal, followed by the obstruction of the tube.

It is seen, in this research, the predominance of incidence of loss of NGET for nutritional support due to obstruction, according to the records placed in the instrument of the indicators. According to literature, this type of probe is indicated in many specific situations, such as fistulas, short bowel syndrome, non-specific

indigestion, burn, traumas, multiple injuries, patients in coma or semi-consciousness state, risk of aspiration, among others[17].

The incidence of SI in health services is a preoccupation, as such morbility generates pain, discomfort, and physical and emotional suffering. This aggravation also prolongs hospitalization stay, increases the costs of treatment and workload of the nursing team. Among the critical determinants for the origins of SI there is the intensity and the duration of the pressure over the tissues, and the tolerance of the skin and adjacent structures to support it[18].

These aspects are related to the mobility of the patient, understood as the capacity to change, keep, or sustain certain body positions; the ability to remove any pressure from regions of the skin/body to promote blood circulation; and the sensorial perception that implies in the level of consciousness, reflected in the capacity of the individual to perceive painful or uncomfortable stimuli and react, changing the position or asking for support to do it[18]. In agreement with these findings, Borghardt *et al*.[19] classifies ICU patients as critical, as besides the clinical gravity and all the risks that intensive care involve, these patients are permanently in resting dorsal position for long periods of time, which favors the conditions to develop and worsen the injuries due to the excess of pressure over the occipital, sacral, and calcaneus regions.

The risk factors of the non-planned extubation of the endotracheal cannula: motor agitation; mental confusion; sensitive deficit; neurological disorder; use of sedatives r post-sedative period; incorrect placement of the endotracheal cannula; inadequate pressure of the cuff; incorrect use of the support for venting extensions and circuits; and mobilization of the patient. In the present study, there is a inverse proportional correlation between the absenteeism rates and the incidence of non-planned extubation of the endotracheal cannula, which it suggests to conclude the effective performance of the nursing team, which is responsible to manage the patient (bath, hygiene, medication, oropharyngeal aspiration, cleaning, and cannula).

The percutaneous vascular access, both venous and arterial, is a routine over the ICUs. The industrial and technological development permitted the market to develop catheters that have more biocompatibilities, designed to facilitate the proceedings for vascular probing, reducing the risk of complications in short- and long-term. However, some basic points must not be forgotten, once depend exclusively from human interactions so the benefits are greater than the risks involved in such proceedings, high invasive ones. they are: the complete understanding of vascular anatomy and adjacent structures; indications and choices of the type of catheter, place for puncture, and technique of vascular insertion; rigorous obedience to the technical steps described to perform the punctures; understanding of potential complications; rigorous observation of surgical precepts of antisepsis and asepsis in its performance; radiological control of the final position of the catheter in the cases of central venous catheter; handling of catheter and its connections under rigorous principles destined to prevent further complications, in special the infections; constant observation and attention to early detection of suggestive signs of malfunctioning, infection, or thrombosis; limitation of the usage to the shortest time possible.

The manual of standards and routines present in the studied unit establishes the change of venous puncture every 72 hours, according to the protocol of the Commission for Control of Hospital Infections (CCIH) of the institution. Therefore, this was the criteria used to analyze the risk factor related to the period of time for the access. Related to that, 38% of the medical

records analyzed do not show any information about these changes.

The quality of care is intimately linked to the performance of people, to the process of working and recording, based on the enterprise's culture[16]. The improvement of quality is a continuous process, with satisfactory results in a long run.

It is patent that the elaboration of strategies to minimize the absenteeism and turnover rates is necessary, once they aim to promote the general aspects of the health of workers. These strategies, built into programs and preventive actions, aim to improve the working conditions and the offering of positive means to face the adversities of the working environment, so both the quality of the service provided to the final user and the health of nursing professionals can improve. It is evident that the health issues are the main causes that lead workers to miss a working day, in special when a relative falls ill.

The main results of the research are those that originate from the joint analysis of the necessities for patient's care, the amount of professionals with adequate abilities, knowledge, and behavior, and the increase of the indicators of quality that are constantly under record in the studied unit. In this sense, it was evident that absenteeism of nursing personnel generates an increase of the selected indicators of quality. Such situation occurs due to the fact there are insufficient human resources to provide care in an adequate level to the critical patients.

It is important to mention the limitation of this research, which occurred in a reduced period of time, as well as the necessity to redo the calculations for the rates, once the data provided from the records did not mention any referential standard.

The negative result of the indicators of quality influences directly in the assistance provided because the quantitative and qualitative dimensions when comparing the usage of human resources must be in accordance with the necessities of the group of patients to be assisted. therefore, the study of indicators of human resource management in nursing is directly related to both the promotion of health among workers and the health state of the patients, as it provides favorable opportunities for working, respecting the laborer and the user.

CONCLUSION

The results demonstrate higher rates of absenteeism and turnover among nursing technicians when compared to the rates of nurses. In an evaluation of the indicators of care quality, the highest incidence was the loss of CVCs (29.03%).

The observation of the correlation between indicators of human resources management and the indicators of care assistance did not demonstrate significant statistical correlation, which possibly is due to the small number of participants in the study, or the limitation of the period observed. However, some strong correlations ($r>0.7$) were demonstrated, such as the nurses turnover index and the incidence of non-planned extubation; and between the nursing technicians absenteeism index with all the indicators of care assistance.

The research provided elements to improve managerial conduction and improvement of care practices, aiming to subsidize strategies of management that promote the restructuring of care processes in nursing, and the reformulation of human resources management policies, focusing on the amplification of investments in the field of health and quality of life of health professionals. Then, it will be possible to offer health care in a safer manner, reducing losses to the patient.

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