



## RESEARCH

## HARD TECHNOLOGY IN THE INTENSIVE CARE UNIT AND THE SUBJECTIVITY OF NURSING WORKERS

A TECNOLOGIA DURA NA UNIDADE DE TERAPIA INTENSIVA E A SUBJETIVIDADE DOS TRABALHADORES DE ENFERMAGEM\*  
 TECNOLOGÍA DURO EN LA UNIDAD DE CUIDADOS INTENSIVOS Y LA SUBJETIVIDAD DE LOS TRABAJADORES DE ENFERMERÍA

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## ABSTRACT

**Objectives:** To identify the views of nursing staff on the use of technology in everyday hard work and describe the impact of technology use in the subjective dimension of these hard workers. **Method:** descriptive and qualitative. Data were collected between September and October 2010, through semi-structured interviews and the information has been processed by the method of thematic content analysis. The study included 05 nurses and 05 nursing technicians. **Results:** The results showed positive and negative aspects of technology use and the harsh impact of the use of this technology in the context of the Intensive Care Unit. **Conclusion:** It is concluded that the effects are multifactorial in the subjectivity of the worker and that this work aimed to boost research involving new technology and hard worker health. **Decriptors:** Nursing labor, Intensive therapy, Technology.

## RESUMO

**Objetivos:** identificar a opinião dos trabalhadores de enfermagem sobre o uso da tecnologia dura no cotidiano de trabalho e descrever as repercussões do uso da tecnologia dura na dimensão subjetiva destes trabalhadores. **Método:** Pesquisa descritiva e qualitativa. Os dados foram coletados no período de setembro e outubro de 2010, por meio de entrevista semiestruturada e as informações foram tratadas pelo método de análise temática de conteúdo. Participaram do estudo 05 enfermeiros e 05 técnicos de enfermagem. **Resultados:** Os resultados mostraram aspectos positivos e negativos do uso da tecnologia dura e o impacto do uso desta tecnologia no contexto da Unidade de Terapia Intensiva. **Conclusão:** Concluí-se que as repercussões são multifatoriais na subjetividade do trabalhador e objetivamos que este trabalho impulse novas pesquisas envolvendo a tecnologia dura e a saúde do trabalhador. **Descritores:** Enfermagem do trabalho, Terapia intensiva, Tecnologia.

## RESUMEN

**Objetivos:** Identificar los puntos de vista del personal de enfermería sobre el uso de la tecnología en el trabajo duro todos los días y describir el impacto del uso de la tecnología en la dimensión subjetiva de las trabajadoras. **Método:** Estudio descriptivo y cualitativo. Los datos fueron recogidos entre septiembre y octubre de 2010, a través de entrevistas semi-estructuradas y que la información haya sido procesada por el método de análisis de contenido temático. En el estudio participaron 05 enfermeras y 05 técnicos de enfermería. **Resultados:** Los resultados mostraron aspectos positivos y negativos del uso de la tecnología y el impacto severo de la utilización de esta tecnología en el contexto de la Unidad de Cuidados Intensivos. **Conclusión:** Se concluye que los efectos son multifactoriales en la subjetividad del trabajador y que este trabajo tuvo como objetivo impulsar la investigación con las nuevas tecnologías y la salud del trabajador duro. **Decriptores:** Trabajo de enfermería, Terapia intensiva, Tecnología.

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## INTRODUCTION

The object of this study is the impact of technology on the subjective dimension of the hard work of nursing in the intensive care unit (ICU). This object is a snippet job of completing undergraduate degree, defended in 2010, the Faculty of Nursing at the State University of Rio de Janeiro, entitled "The use of technology in intensive care and nursing subjectivity of the worker."

Interest in the study emerged from the academic activities undertaken in the field of intensive care, when observed empirically, using many different technological devices, which helped in client care. However, use of these technologies strangeness caused due to the complexity in handling the variety of equipment for the same purpose and little psychomotor skill of some workers and students themselves in management.

It is known that the work environment can act positively or negatively on the health of the worker, so that your physical wellbeing and mental influence your productivity. In this interaction, when the work is suitable for the worker, this is its action on potentiating or health insurance company.<sup>1</sup>

Therefore, it is considered that this environment constitutes an accelerated pace of work and focuses a significant psychological burden for dealing with customers in critical condition, indoors and experience noise nuisance as: alarms of infusion pumps, ventilators mechanical and monitors, among other factors that often make the environment an intensive care unit adverse health workers, causing dissatisfaction, anxiety and psychophysical diseases.<sup>2</sup>

Trailer this context, means that a sector well-structured intensive care requires that staff  
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have sufficient and trained mainly with capacity to cope and adapt to emergency situations to provide a differentiated service, as well as a physical plant suitable for this type of assistance. It follows also that the nursing staff of an intensive care unit should be prepared to deal with highly specific situations such as increasingly complex technologies, customers increasingly compromised physically, increasingly elderly population, the availability of high speed health information, among others.<sup>3</sup>

However, in healthcare there is the use of various technologies in favor of the customer, the working process and work organization, characterizing the massive use of technological devices in the hospital and other health services. Sets up technology in nursing, as a set of scientific knowledge that are applied to the generation and use of tangible or intangible products, which will contribute to the work process itself and the organization of human relations.<sup>4</sup>

In health care, these technologies are classified as mild, soft-hard and hard. The soft technology refers to technologies of production relations of communication, the host of relationships and the soft-hard technology constitutes the structured knowledge of the health, and the hard technology relates to all technological equipment, standards, routines and organizational structures. The latter type of technology, the subject of this study, since the fall infusion pumps, mechanical ventilators, hemodynamic monitors, among other technological devices, which the nursing staff has to deal with, to ensure critical customer care.

In this perspective, it appears that the world's health work and watch at the same time, promotes a linkage between the three technologies mentioned above, which are added to achieve the best customer service.

Given the complexity involved in health work becomes relevant to allude to the risks to which the worker is exposed, which involve risks chemical, physical, biological, and ergonomic accident. In turn, the ergonomic risk houses the psychosocial risk focus of our interest, because it involves the subjective worker confronting the organization of work.<sup>6</sup>

It is also worth noting that psychosocial risks, being housed in the sphere of subjectivity, are very difficult to be identified and understood, thereby running the serious risk of being considered normal, because they involve stressors of nursing work.<sup>7</sup>

Regarding the problem scored, set the following objectives: to identify the views of nursing staff on the use of technology in their daily hard work and describe the impact of technology use in harsh subjective dimension of nursing workers.

## METHODOLOGY

This was a study with a qualitative and descriptive, developed into an intensive care unit of a teaching hospital. In accordance with Resolution 196/96, after signing an informed consent, participated in the study 10 workers working in this ICU, 05 nurses and 05 nursing technicians through semistructured interviews recorded on audio device.

The interviews were conducted between September and October 2010, in the morning and afternoon, observing the routine sector lest prejudicássemos work activities. Importantly, the project was approved by the Ethics in Research (CEP) of the institution, under number 2688/2010.

The quantitative subjects was linked to the time to develop a monograph final year undergraduate period comprised eight months. That is four months to develop and approve the project, and another four months to collect and J. res.: fundam. care. online 2013. out./dez. 5(4):681-89

analyze data and prepare the final report. Thus, given the paucity of time, we chose to stay with 10 subjects. However, one should note that the data from, the seventh interviews began to repeat itself, pointing to the criterion of recidivism information.<sup>8</sup>

Formed as inclusion criteria of the subjects that they should be inserted into the workforce in the sector and effective exercise of the function and should act in the ICU for at least a year. This criterion embasou on concern that the subject had already seized the labor reality around them, having a concrete vision of the organization and work process. Another criterion conformation of the subjects was volunteering, free and spontaneous acceptance and availability of time to provide the information.

For data analysis we used the technique of thematic analysis content.<sup>9</sup> Being thus, it is considered that the choice of this technique provided a more comprehensive, yet profound, since it gave apprehend the complexity involved in participants' speech. Thus, their applicability has resulted in the construction of two categories of analysis: between good and evil use of technology: a dialectic question ICU, and worker health: between the lines of using technology.

## RESULTS AND DISCUSSION

Were identified over the content analysis, 104 registration units (RUs), and continuing in the steps of the technique, after identifying these URs have named and characterized eight major themes or meaning units, which helped in the preparation of two categories previously cited, which will be discussed below.

### **Category 1 - Between good and evil the use of technology: an issue in icu dialectics**

This category represents 69.23% of the units of records found, and presents as an important point of analysis the positive and

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negative aspects of technology use in the harsh environment of the ICU, since the collected material were seized dialectical conceptions about the applicability of this technology as good and bad, healthy and non-healthy. Apprehend or contradictory aspects imbricadamente interpostamente living in work in ICU and in view of the nursing staff.

It might be hard to realize that the technology in the ICU environment was cited as a facilitator of the work process many times in various interviews, being alluded to as a tool that reduces the working time; keeps the patient clinically controlled; provides rapidly parameters laboratory and hemodynamic of patients, among others. This analysis can be evidenced by the speech presented below:

*Technology is an enabler of work, you can have greater security regarding the patients' vital signs, decreases your work at the time of drug administration. (E4)*

In addition, the modern technology applied in the context of ICU equipment brought lighter and far more sophisticated, and it was recognized as another aspect of the facilitator work because it prevents the worker take weight, protecting it, somehow diseases musculoskeletal.

*For 20 years the CTI was a very loud, it was like you're riding in an ambulance, something whistled all the time, but today you have to control that. It is easier to control the alarm you, once you had the volume control, noise was there in the "ceiling", as you now have control. [...] You first view the change, not before, now played before the alarm and were not reliable parameters, depending on the equipment. (E4)*

*The patient is monitored with the monitor being modern, archaic because they were not so good, now they give you a more reliable parameters and that helps us a lot. Moreover, they are mild, we take avoid too much weight. (E7)*

It is known that the use of hard technology in healthcare occurs in favor of the patient and in favor of the employee, as it facilitates the work process and organizes work activities, precisely because they provide clinical and laboratory parameters that anticipate complications, enabling the team to act before the patient has sequels or they become serious. Consequently, workers can plan their actions with less tension, feeling calmer and safer due to the complexity of the situation. Thus, as technology makes it easier and allows less physical effort, it increases the quality of life for workers.

In contrast, this feeling of well-being beyond nursing staff, because when he states that as the technology improves efficacy of treatment by allowing, for example, is administered to the patient the exact amount of a given drug, there is an increased comfort and quality of life of the patient and the nurse.

*Thanks to technology we can say that we can not only improve the quality of care in intensive care, and the quality of care in intensive care for the worker. (E3)*

*It is important to use the technology both for patient comfort, treatment progress for him and also facilitates the professional life and improves the quality of care. (E5)*

On the other hand, mentions that, even though the technology facilitates the work process and raise the quality of care, if workers do not receive training or training for handling the equipment, or if such training or not training properly planned, operated, evaluated and reinforced during the actual working hours of professionals handling the hard technology will become a suffering and generate occupational stress.

Another aspect relates to the perceived deficit in the quality of equipment manuals, which often are in languages other than Portuguese, or

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the information is not clear, or even missing relevant information.

*When you receive new equipment, the technician comes and shows that company equipment operation only. After never see that person [...]. And sometimes it was not so well informed on how to use and handle and then you have to learn alone. Stirring [manipulating] you learn and discovering other things, other functions. (E7)*

While that technology can streamline the work process, increase quality of care, it can also bring harm if not used well and if the trader fails to appropriate the correct way of functioning. Thus, one can infer that the underutilization of technology harms, and often leads to excessive unnecessary work for lack of knowledge of the technological apparatus used.

The lack of maintenance of the equipment is another negative aspect alluded to in the speech of individuals. This generates a great deal of stress among nursing staff in the ICU because an environment in which the patient must be monitored because of his critical condition, in this perspective depends on such equipment in perfect working condition to ensure your safety and your life, plus reverse in tranquility for workers.

Therefore, throughout the discussion of this category have been found to positive and negative aspects connected to the use of hard technology in the context of ICU. And, it was found that this variability of questions concern the subjective dimension of nursing, sometimes impacting positively, sometimes bringing negative consequences, and they also generate changes in the disease process of these workers, particularly in mental health.

## **Category 2 - The health of te worker: between the lines of using technology**

In this second category were covered 30.77% of the units of records and aimed to analyze the impact of technology use in the context of hard Intensive Care Unit in the subjective dimension of nursing. Throughout the construction of this category, it was found that most of these units records (10.46%) allude uncomfortable about the noise coming from the technology. Therefore, we prepared an analysis on the impact of technology use in the context of hard ICU in the subjective dimension of nursing.

Fragments of interviews some say the noise coming from the technology are stressors for being repetitive and annoying noises with varied beyond alarming due to the need to draw attention to certain hemodynamic parameters that are not always true and, often, alarmed at same time.

It is known that for the nursing staff, these noises related to appliances hemodynamic and ventilatory support may be the most disturbing because they are, for the most part, related to technical failure of equipment, lack of maintenance and the electrodes that detach the patients, 10 as well as the improper setting of the parameters specific to the patient. This is borne out in the speeches of the study subjects:

*[...] The noise stress you give headache. (E1)*

*Imagine you, with seven patients monitored with a cardiac monitor, pulse oximeter, ventilator and infusion pump. All equipment must alarm. Imagine these alarms over 6 hours on duty, 12 hours on duty, is a hellish thing [...]. (E10)*

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There prerogative that the alarm can shoot through incorrect operation, not change characterizing the state of health of the patient. Thus, the technology rather than facilitate the work may eventually lead to excessive load, since not always true hemodynamic parameters are provided, sometimes alarms or fire ineffective due to the maintenance of the apparatus.<sup>11</sup>

In this perspective, it became clear that the workers eventually encounter some limitations in work organization, which are: the lack of preventive maintenance of equipment, poor maintenance of machinery and at the same time, lack of training for workers deal with the hard technology. Thus, it appears that these factors are beyond the control of the workers and results in anguish and frustration, causing greater suffering on the part of these professionals.

It was also found that the negative impact of noise on the subjectivity of workers is much higher than previously thought, because it goes beyond the workday, since it seized some reports implying that at the time of labor and rest breaks in home, the subjects reported still hear the noise of the equipment and alarms. This fact can be evidenced in speeches outlined below:

*[...] I confess that I often heard the alarm in my house [...]. Because both of you listen, you get home, be with all the time the sound in your ear. (E7)*

*You walk out of here with that sometimes sound insane watching you. Hence some team members off the alarm. That I am aware, because of the noise itself. (E10)*

By analyzing these reports is relevant to ratify all the factors that can cause an occupational hazard, noise appears as the most frequent, the most universally distributed and thus exposing as many workers.<sup>2</sup>

It is possible to infer that changes may occur not only in the subjective dimension of these workers, but also in the physical dimension, affecting organs and senses. In an intensive care setting, there are continuous sounds, which are related to devices connected to the patient and remain at work for 24 hours, there is no way to suppress them and intermittent sounds, it is all those that arise unexpectedly, as the alarms of the equipment, for example.<sup>11</sup>

Other aspects, such as continuous and rapid change of technology and training hard enough workers to handle the high integration of this technology in the ICU environment were also cited as situations that negatively affect the subjectivity of nursing. Therefore, inferred that when the subjects are taking over the operation of the device and are using their technological resources in favor of reducing the workload and the benefit of a nursing care even safer, new technology fits into the ICU which is necessary relearn the entire process of operation thereof.

Like, caught up in the 'speech certain feeling of abandonment and sadness when reminded of the Occupational Health Service, in the sense of the professionals who work there to assist prevent health hazards.

*A health worker in the hospital is only there [Health Division]. I do not see a nurse [...] coming here in the ICU or in any area of the hospital worrying about weight [ergonomic risks] [...]. (E3)*

*[...] When is hemodialysis, ICU is flooded because of equipment and addition of water, you still have to be jumping rubbers, is a stress. [...] Called the occupational health team, they were here, but nothing happened, it bothers a lot. (E10)*

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The organization of work can not avoid the responsibility to ensure decent working conditions for workers. It is of great importance to mention that when the conditions are not adequate and the problems are not resolved, workers need a process of continuous creation of mechanisms for coping with these conflicts daily living and this often leads to suffering, and even in the same pathologies.

However, psychological distress can not generate a mental disorder, because the individual develop strategies and coping mechanisms that allow sufficient even control this process. However, it is necessary to remember that not all individuals who are able to establish such mechanisms and therefore may get sick.

As a final point to be addressed in this category, it is noteworthy that initially when the subjects were asked about the positives and negatives of using technology in harsh environment of the ICU, they soon reported (60% of subjects) no negative aspects. However, over the course of the interview, these same subjects indicated negative effects of technology use in the subjectivity of nursing. This pointed to alienation of individuals about the benefits / harms of hard technology.

The insanity is when you have a contradiction in the ratio of the individual, causing losses in the power of choice and judgment of the same, due to a loss of critical judgment and, therefore, the individual becomes oblivious to everything that happens around you .

This is the century of globalization and technological innovation in the marketing and media try to "sell" the idea of unrestricted and positive benefits of these tools of production. Thus, the population, a first impulse and inadvertently finished considering that there are

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only gains with the use of technological devices in various work environments. In fact, there are many positive aspects in the use of hard technology in patient care in the ICU, such as reading speed in hemodynamic parameters, rationalization of time and safety in patient care, among others.

However, one should take a critical look at the benefits and harms of using technology in the harsh environment of the ICU in order to maximize the positive aspects for health workers and strategize to cancel and / or minimize the negative aspects, excelling thus the quality of life of nursing professionals.

## CONCLUSION

We conclude that the effects on the subjectivity of nursing workers on the use of technology in the harsh environment of the ICU are multifactorial. Investment in higher quality products is of utmost importance, since the acquiring technologies questionable quality or lower, resulting in higher costs. For the durability of the equipment ends up being less, and these devices supposedly not provide all the features of similar qualities higher offer, thus disadvantaging the process of nursing work.

Moreover, from the prerogative of those workers have the right and need further assistance and care with their own health, it is important to emphasize the importance of the performance of a health team worker assessing and managing the risks which workers are exposed in nursing their workday, intervening when necessary to reduce and prevent health problems and damage them.

Another issue that makes mister emphasize is precarious Health System, since most of those impacts are caused by problems related to the

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institution and management, whose ideology the "downsizing of public administration", inspired by the model neoliberal. Lack the perception that the worker needs resources to perform their duties in a dignified and healthy as well as the perception that the professional is not simply a labor-work laborer, he is a human being who feels, want, have values and need to be cared for and respected as such.

Finally, this work aimed to boost research involving new technology and worker health and instigate the interest on this important issue, but so little explored.

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