



## TECHNOLOGY IN NURSING CARE AND WORKLOAD IN AN ICU

### TECNOLOGIA NO CUIDADO DA ENFERMAGEM E A CARGA DE TRABALHO EM UTI

### TECNOLOGÍA EN LA ATENCIÓN DE ENFERMERÍA Y LA CARGA DE TRABAJO EN UNA UCI

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#### ABSTRACT

**Objective:** think through the use of technology and the influence of workload on the nursing team in an intensive care unit (ICU). **Method:** philosophical theoretical reflective study using Alan Barnard's assumptions, who thinks of the philosophy of technology from the perspectives of engineering and humanities. **Results:** the ICU environment is permeated with cutting edge technology and aimed at treating seriously ill patients, thus technological innovation becomes a must. The latter, in turn, changes the health working process by influencing health professionals' workloads, especially among the nursing team that provides direct care. **Conclusion:** workloads in the nursing team may decrease as professionals acquire greater mastery of new technologies and an appropriate number of professionals. **Descriptors:** Workload; Technology; Intensive Care Unit; Nursing.

#### RESUMO

**Objetivo:** refletir sobre o uso da tecnologia e a influência nas cargas de trabalho da equipe de enfermagem em unidade de terapia intensiva (UTI). **Método:** estudo reflexivo teórico filosófico utilizando os pressupostos de Alan Barnard, que considera a filosofia da tecnologia nas perspectivas de engenharia e humanidades. **Resultados:** o ambiente da UTI é permeado de tecnologia de última geração e destinado ao tratamento de doentes graves, assim torna-se necessária a inovação tecnológica. Esta, por sua vez, modifica o processo de trabalho em saúde influenciando as cargas de trabalho dos profissionais da saúde, em especial a equipe de enfermagem que presta cuidado direto. **Conclusão:** as cargas de trabalho na equipe de enfermagem podem diminuir à medida que os profissionais adquirem maior domínio das novas tecnologias e uma quantidade adequada de profissionais. **Descritores:** Carga de Trabalho; Tecnologia; Unidade de Terapia Intensiva; Enfermagem.

#### RESUMEN

**Objetivo:** reflexionar sobre el uso de la tecnología y la influencia en las cargas de trabajo del equipo de enfermería en una unidad de cuidados intensivos (UCI). **Método:** estudio de reflexión teórico filosófico utilizando los supuestos de Alan Barnard, que piensa la filosofía de la tecnología desde las perspectivas de la ingeniería y las humanidades. **Resultados:** el ambiente de la UCI está impregnado de tecnología de punta y es destinado al tratamiento de pacientes gravemente enfermos, por lo que la innovación tecnológica se convierte en una necesidad. Esta, a su vez, cambia el proceso de trabajo en salud influyendo en las cargas de trabajo de los profesionales de la salud, especialmente el equipo de enfermería que proporciona atención directa. **Conclusión:** las cargas de trabajo en el equipo de enfermería pueden disminuir a medida que los profesionales adquieran un mayor dominio de las nuevas tecnologías y un número adecuado de profesionales. **Descriptores:** Carga de Trabajo; Tecnología; Unidad de Cuidados Intensivos; Enfermería.

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## INTRODUCTION

Work is an ancient activity inherent to human beings, it occupies a considerable part of life and involves an individual's subjectivity, this can be a source of distress and fatigue for some people and pleasure for other subjects<sup>1</sup>, something key to recover and/or ensure health, or it can even be characterized as a factor that deteriorates occupational health.<sup>2</sup>

In daily nursing work, the focus of nurse's actions is organizing care, which is translated into planning actions shared so that the nursing team, under the leadership of a nurse, develops work with efficiency and quality, in order to meet patient's needs.<sup>3</sup>

According to nursing work conditions, especially in hospitals, they have been regarded as inappropriate in terms of the specific risks of the environment that generates health hazards.<sup>4</sup> Inadequate remuneration, accumulated working schedules, exhausting working hours, features involving pressure in health services, hierarchy in the health team, poor conditions of material and human resources, and social lack of prestige are reflected in quality of care provided to the user and mental distress among professionals.<sup>4,5</sup> In addition, it is observed that often nursing workers undergo an excessive workload, and one of the biggest problems in health care, especially those who work in hospitals, as a result of the ways how work is organized.

An insufficient number of nursing professionals leads to an increased workload, causing implications related to patient care, as well as the occurrence of occupational accidents and health problems among nursing workers.<sup>6-8</sup>

Workloads are characterized as worker exposure, in the various forms of work organization, to health problems when providing patient care, as well as handling of materials and equipment, classified into physical, chemical, biological, mechanical, mental, and physiological loads.<sup>7</sup>

In intensive care units (ICUs), concern about the workload is increasing. This arises due to the impact of increasingly improved technologies aimed at care, imminent emergencies, critically ill patients' profile change, and need for specialized care, requiring constant control and medical and nursing assistance, which increases demand and costs in these facilities.<sup>9</sup> However, there is a need to introduce increasingly refined technologies seeking, by means of

applications, to preserve and maintain a critically ill patient's life, through more effective therapies and controls, something which requires health professionals who are highly trained and skilled.<sup>10</sup>

Studies<sup>11,12</sup> show that technological innovation changes the health care process influencing the workloads of professionals and potentially interfering with the quality of life at the workplace and the quality of nursing care.<sup>13</sup> The meaning of the word technology is increasingly associated with sophisticated machines, industrial objects, computerized or electronic automata, scientific knowledge, and technical skills.<sup>14</sup>

Nursing care involves all technological dimensions, permeating both the perspectives of engineering and the humanities, where harmony between the two dimensions of technology are key and they require at the same time knowledge and skills having a relational nature. Knowledge in the clinic and technical specialized knowledge to care for critically ill patients need to glimpse the need to incorporate equipment for their survival. Thus, in nursing technology is expressed through nurses' knowledge and skills associated with using resources and objects by in their daily practice.<sup>14</sup>

Based on the considerations above, the objective of this article is:

- Think through the use of technology and the influence of workload on the nursing team in an ICU.

## METHODOLOGY

This is a philosophical theoretical reflection, discussing about the use of technology in nursing care and the workload of a nursing team in an ICU using Alan Barnard's assumptions, who is a professor at the School of Nursing of the Queensland University of Technology, Australia. Alan Barnard thinks of the philosophy of technology from two perspectives: the engineering perspective, which explains the nature of the technology in terms of technical use, concepts, methods, design, and objective presence; and the perspective of humanities, which depicts technology as what we do in relation to how the world is experienced by individuals, groups, and cultures.<sup>15</sup>

This theoretical reflection using Alan Barnard's assumptions is derived from attending as students the subject "Philosophy of Science, Health, and Nursing," delivered in the Ph.D. course in Nursing of the Graduate Program in Nursing/Health of the Federal University Rio Grande (FURG).

## RESULTS AND DISCUSSION

### ♦ Technology in nursing care and workload in an ICU

Technological innovations stand out in the transformation process that has occurred in the job market, since the 1970s in capitalist countries, and since the 1990 in Brazil, and they have greatly influenced the health industry.<sup>16</sup> Intensive use of cutting edge technology equipment in the health field has contributed so that some diagnostic and therapeutic procedures become less invasive, enabling a faster recovery of users and less complications.<sup>17</sup>

In nursing care, technology advances towards improving patient care and the workplace. Technology has transformed the nursing practice in the workplace, not only in terms of machinery and equipment, but the skills we have developed and the knowledge we master, the values we advocate, and the importance of nursing for society.<sup>18</sup>

In this context, the philosophical approach aims at identifying the nature of technology, how it is expressed through human relations. Technology in engineering is examined through the mechanistic or functional viewpoint, in terms of instrumental awareness.<sup>14</sup> In turn, technology in the humanities, although accepting the perspective of engineering, includes the objects or users beyond the understanding of technological events, starting from a deeper insight into the meaning of using technology and its relationship with the world, by analyzing non-technical aspects of the world of life, embodies the meaning, interpretation, culture, traditions, values, and praxis.

In this reflection, we assign greater emphasis to using equipment, machinery, and the whole dimension of technology in engineering, since they are very clear in care provided in the ICUs to establish the relationship with the workloads of nursing professionals.

The ICU is described as an environment permeated with state of the art technology aimed at the treatment of seriously ill patients, in critical condition, who require complex care and continuous monitoring and control, as well as continuous medical and nursing care.<sup>19</sup>

This specificity of care requires higher technical and scientific knowledge from the nursing team, in addition, it must rely on an adequate physical infrastructure, material resources for providing good quality care, as

well as proper human resources both in quantitative and qualitative term.<sup>20</sup>

In this interface, new technologies, especially new equipment, often make the job easier, but depending on the organization of the facility and the working conditions, they can increase workloads. The combination of small number of nurses to provide care to users who require constant vigilance and the high occupancy rate of services results in greater workload.<sup>16</sup>

Workloads may be defined as elements of the work process that interact with each other and the worker's body, in a dynamic process, which can trigger biopsychic changes, showing up as potential or effective physical and psychological burden.<sup>16</sup>

The introduction of a technological innovation implies change in the flows and procedures in the clinical practice.<sup>16</sup> There may occur increased workloads when workers need to be prepared to handle new working tools or work in a different way.<sup>21,22</sup> After the adjustment period, the implementation of technology tends to streamline procedures and decrease workloads, as well as bring benefits to users' health.<sup>23</sup>

A study<sup>24</sup> conducted with health professionals in five hospitals in Brazil and the Netherlands shows that the time of deploying something new generates increased physiological and psychological/emotional burden, especially due to the need to familiarize with the new situation. Besides, when the use of high-tech equipment and organizational change are not accompanied by an adequate amount of professionals, where the same number of workers need to fulfill more activities in terms of quantity and diversity than before deploying the innovations.<sup>24</sup> Conversely, workloads may decrease as professionals acquire greater mastery of new technologies, when they realize that the latter contribute to greater problem-solving in their workplace and relying on an adequate amount of professionals.<sup>24</sup>

It becomes clear that adopting technological innovation does not replace human labor, but it requires an appropriate number and qualification of personnel. Thus, nursing care is interconnected to technology, since nursing professionals are committed to principles, laws, and theories and technology represents scientific knowledge.<sup>25</sup>

## FINAL REMARKS

Technological innovations are not essentially positive or negative in relation to health professionals' workloads, but they can

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increase or decrease the latter ones depending on multiple factors.

The insertion of new technologies, on the one hand, leads to new demands, often increasing the intensity of work, requiring multidisciplinary knowledge and workers with varied and complementary kinds of expertise. On the other hand, this contributes directly to care quality, efficacy, effectiveness, and safety.

In this regard, the use of technology proves to be key in nursing care, however, it should be guided by humanistic principles, since it affects nurse's work and the client.

The nurse plays a major role in the use of technology in engineering and humanities in the health field, in daily care, taking responsibility to interpret and influence the relation between technology, clinical praxis, and human experience.

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