

Nurses' views: organizational resource consumption models in hospitals

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ABSTRACT

The optimal use of available resources is important for every organization. Therefore, the status of resource consumption should be first specified. In this regard, research was conducted to investigate the status of organizational resource consumption from nurses' perspectives. This qualitative research with a conventional content analysis approach explored nurses' views on organizational resource consumption. 21 nurses and nursing managers in hospitals in Isfahan were selected by purposive sampling. In-depth semi-structured in-person interviews were used to collect data. Nearly 900 interpretive meanings were obtained from qualitative content analysis of in-depth interviews and field notes. Then, 63 common interpretive meanings were identified, abstracted, and labeled in 27 codes. The resulting codes were compared based on differences and similarities and were sorted into 5 sub-subcategories (Appropriate individual consumption, Properly managed consumption, Individual consumption, Deviant consumption, Compulsory extravagance) and 2 main (optimal consumption, inappropriate consumption). Findings indicated that participants had different views on the organizational resource consumption among nurses and its effective factors. Most nurses in the managerial position assumed the optimal organizational resource consumption by nurses, and a few nurses in clinical wards considered their organizational resource consumption to be optimal. Based on the results. There was wastage of organizational resources in the hospitals, and second, the wastage was not too much in terms of managers' opinion as there might be a lack of proper monitoring system or the nurses' errors were ignored by managers. Therefore, nurses' and nursing managers' views differ in ways of consuming the organizational resources.

Keywords: Hospital management, Organizational resources, Resource consumption model (RCM), Nurse, Iran

Introduction

The hospitals are among the most vital organizations in any society and the uncertainty about current changes has risen the sensitivity to related issues [1]. Approximately 50 to 80 percent of the health sector budget is allocated to hospitals. In Iran, more than 4.6 percent of the Gross Domestic Product (GDP) is allocated to costs of the health sector; however, despite a large

volume of resources in hospitals and the health sector, there is a gap between the growth of available resources and necessary resources of this sector and there is a need to make effective use of available [1-4].

Energy is an organizational resource of hospitals. Studies indicate that 30% of hospitals' current costs are related to energy costs [2], and they are the most controllable costs in hospitals [3]. Medical equipment is another important hospital resource, which plays a special role in promoting social health and safety and annually allocates 5% to 15% of health funding to medical supplies from inside and outside the country [4]. Hospital managers also annually consider 10 to 20 percent of the purchase price of this equipment for maintenance in their financial plan. On the other hand, the maintenance and repair status of medical equipment is not favorable in developing countries leading to much extravagance of health costs [5]. Therefore, the proper and

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efficient management of medical equipment consumption and maintenance can have a significant impact on the national development of any country in terms of health economics [2-7]. Medical consumables such as medicines, syringes, and serum sets, as well as non-medical consumables such as stationery, are another portions of organizational resources of hospitals that need significant cost to be prepared so that consumables rank third in costs of hospitals. Meanwhile, after the cost of human resources, the cost of hospital medicines accounts for the largest share of direct hospital costs [6]. Some of the widely-used imported hospital materials are causes of the exchange outflow from countries, and thus the optimal use of the resources is of paramount importance. Making the consumption models closer to a favorable model for developing countries, including Iran, is not only a short-term, one-year policy but also a strategy because a consumption model is not only an economic issue but also a social and cultural issue, leading to the complication of issue [7]. Organizational resources can be used to provide better services by reforming consumption models through preventing the extravagance of human and financial resources [8].

In almost all countries, nurses constitute a major part of the health system [9]. As the largest professional group in the health system, nurses have a significant potential to affect the quality of health care; and their performance can have a significant impact on it [10].

If nurses' performance is associated with proper consumption of organizational resources, and vice versa, if their performance is associated with inappropriate and improper consumption, it has a significant impact on hospital costs, in addition to macroeconomic health and environmental costs.

Given the broad role of this group of medical staff, it seems that the results of examining the way of organizational resource consumption in this group can provide valuable data in this case and be a good source for managers' planning.

Materials and Methods

The present study was qualitative research based on content analysis using a purposive sampling method. Participants were expert nurses and higher in certain hospitals of Isfahan, with at least a year of clinical experience, knowledge about organizational resource consumption, and willingness to participate. After obtaining written consent and ensuring the confidentiality of information, data collection continued through in-depth semi-structured interviews until data saturation. The interviews were privately conducted at the participants' desired places, and the time in 30 to 90 minutes depending on the participants' willingness and their experience. During the interviews, the environment and taking notes from informal observations were also taken into consideration. Therefore, the data collection continued until the data saturation. The results were repeatedly re-read by the researcher, and continued according to the information analysis procedure, followed by the subsequent interview.

The conventional content analysis was utilized to analyze the data of the previous step, and then the necessary content analysis steps, on which almost all the experts agreed, were respectively taken after determining the research purpose and environment and after conducting the interviews:

A) Data preparation: The written interviews were performed using MAX QDA-10 software, and concepts derived from them were identified using the review and comments in the software. B) Description of the analysis unit, C) Development of subcategories, subcategories, categories, and coding, D) Testing the coding project, E) Coding the whole text (coding was frequently repeated in cases where there was no agreement between the researcher and colleagues until agreement was reached between the researchers, and in fact, the coding reliability increased). F) Drawing results from the encoded data; G) Reporting methods and results.

The researcher enhanced data validity with long and constant engagement throughout the research, conducting in-depth in-person interviews in multiple sessions, maximizing diversity in the selection of participants, and ensuring participants' confidentiality of the information and freedom to leave research throughout its stage. Furthermore, all interviews were recorded and converted into written text, the data were reviewed by informed and experienced nurses and participants (not to be among the 21 key participants) as well as several faculty members in the field of qualitative research analysis (those who did not participate in the research), and coding guidelines were used to increase the data reliability [11]. In addition, an agreement was reached between the researchers after reviewing them in multiple sessions to increase the data accuracy.

Results and Discussion

In the present qualitative study, 21 participants including 11 clinical nurses and 10 individuals in different managerial categories including the head nurse, supervisor, and matron were working in educational medical centers affiliated to Isfahan University of Medical Sciences (**Table 1**). Approximately 900 interpretive meanings were obtained from the qualitative content analysis of in-depth interviews with participants and field notes by the researcher. Then, 63 common interpretive meanings were identified that were more abstracted and labeled in 27 codes. The resulting codes were compared based on differences and similarities, sorted into 5 subcategories and 2 main categories (**Table 2**).

Table 1. Baseline participants characteristics

| Variables | Category | Frequency | Percent (%) |
|-----------|------------|-----------|-------------|
| Age | 25-35 | 5 | 24 |
| | 35-45 | 14 | 67 |
| | 45-55 | 2 | 9 |
| Position | Nurse | 11 | 52 |
| | Head-Nurse | 4 | 19 |

| | | | |
|-----------------|---------------------------|----|------|
| Education Level | Supervisor | 2 | 10 |
| | Meteron | 4 | 19 |
| | Bachlore | 18 | 85 |
| | Master | 2 | 10 |
| | Phd | 1 | 5 |
| | Surgery | 2 | 9.5 |
| | Emergency | 3 | 14.3 |
| Ward | Nursing Management Office | 6 | 28.6 |
| | ICU | 4 | 19 |
| | Internal Medicin | 2 | 9.5 |
| | Oncology | 1 | 4.8 |
| | Pediatric | 3 | 14.3 |
| | Male | 3 | 14 |
| | Female | 18 | 86 |
| Total | | 21 | 100 |

Table 2. Findings of the qualitative study

| Category | Main | subcategory | Code |
|--|------------------------------|---|---|
| Dichotomy of Organizational Resource Consumption | 1- Optimal consumption | 1-1 - Appropriate individual consumption | 1-1-1- Care of using equipment |
| | | | 1-1-1- Care of using energy |
| | | | 1-1-3- Care of using consumables |
| | | 1-2- Properly managed consumption | 1-2-1- Appropriate use by training |
| | | | 1-2-2- Appropriate use by supply of consumables |
| | | | 1-2-3- Appropriate use by supply of pharmacopoeia |
| | 2- Inappropriate consumption | 2-1- Individual consumption | 1-2-4- Optimal Consumption by monitoring |
| | | | 2-1-1- Lack of care of using equipment |
| | | | 2-1-2- Lack of care of using energy |
| | | | 2-1-3- Lack of care of using consumables |
| | | 2-2-Deviant consumption | 2-2-1- Biased Consumption |
| | | | 2-2-2- Profitable Consumption |
| | 2-3- Compulsory extravagance | 2-3-1- Extravagance due to insufficient consumables | 2-3-1- Extravagance due to insufficient consumables |
| | | | 2-3-2- Extravagance due to lack of suitable consumables |
| | | 2-3-3- Extravagance due to lack of necessary facilities | 2-3-3- Extravagance due to lack of necessary facilities |
| | | | 2-3-4- Extravagance due to physician's performance |

Findings of the qualitative data content analysis indicated that participants had different views on the organizational resource consumption by nurses. The results led to the creation of a category, namely the "dichotomy of organizational resource consumption". This category consisted of two subcategories including "optimal consumption" and "inappropriate

consumption" that were also derived from codes with similar meanings as a result of code sorting.

Optimal consumption

Findings of the qualitative data analysis indicated that the majority of nursing management participants in health care sectors considered the organizational resource consumption by nurses to be optimal. Data of the subcategory were obtained from considering two subcategories, namely the "appropriate individual consumption" and "managed consumption".

Appropriate individual consumption

Most participants were in managerial positions, and a few active clinical participants believed that the organizational resource consumption was appropriate by nurses and was manifested as the care of equipment use, care of energy use, and care of consumables. For instance, a head nurse states about the use of equipment: "... up to now, I have not said that the personnel's carelessness has caused the device to fail. The nurses have enough precision to use equipment such as DC shocks, and precision ventilators..." (Participant 13). Researcher's note while waiting for the nurse to be prepared for the interview:

"The monitor of a bed is turned on in the section. If there was no disease on the bed, the monitor's wires above the patient's head would be left on the ground".

Another nurse explained that "... nurses are supposed to get help from their assistant paramedics when they use DC shocks to clean its paddles because if these gels are left, ..., their colors will change, and the device will be damaged over time. They are aware of telling the assistant to clean and disinfect them properly..." (Participant 20).

In terms of energy consumption, as an organizational resource, the participants in the management class considered the nurses' consumption to be optimal and believed that nurses were careful in using the hospital's energy needs, including water, electricity, and gas; and a few nurses also considered their energy consumption to be optimal. In response to a question of how nurses are consuming water? a supervisor said: "... The nurses are observing the water consumption. It is not like saying that they have a faucet open when they wash their hands. It is not true. The nurses are not careless..." (Participant 14). A nurse also said, "... I am very sensitive to electricity, and wherever the electricity is on, I turn it off and warn the children to observe..." (Participant 3).

Also, the nursing managers believed that nurses were optimally used drug drugs and consumables, and they were not wasted; and nurses properly and optimally made use of them; and a few nurses believed that their use of consumables was appropriate. For instance, a nursing matron said: "We use papers, which are using as scrap papers in nursing office, for example, the children exam papers. We use their other white sides as scrap papers. It is accepted in our unit that they can be used as the scrap papers, used as a drawer. It is now routine inwards, and if you look, you drawers have something like a print on one side, meaning that they are already used, and thus they are using as scrap papers ..." (Participant 11). A nursing metron said: "... In fact, nurses do not waste drugs. Maybe a doctor prescribes the medication for a patient, then immediately changes or DC that drug, the nurse may

not return the drug to the pharmacy for being busy, so the pharmacy lacked the drug and it has expense for the hospital, but it's not a waste

Properly managed consumption

At the management levels, the participants believed that the nurses' organizational resource consumption, which was managed by the organization, was optimal; and the optimal organizational resource consumption was obtained through factors such as training, supervision, provision of consumables, and preparation of pharmacopeias. A hospital supervisor said: "... In the field of water, electricity, and gas, we established an online group with the hospital manager and all nurses working in the hospital; and shared a series of issues about optimal use of water, electricity, and gas every day. For example, we discuss the importance of proper consumption by nurses and problems with providing the resources. Almost all members are aware of hospital problems; and we ask the nurses for suggestions so that they go deep in understanding the disaster and are careful about it in hospital..." (Participant 15).

In the field of proper consumption by providing sufficient materials, a hospital matron said: "... For example, we supplied high-quality cleaning cloths, so it decreased the waste of sterile gauze as the assistant came and took sterile gauze from nurses and worked because nurses are somehow versatile in any ward, so we controlled the waste of gauze; or for example, we supplied Lever-lock needle as much as they needed..." (Participant 11).

In the field of optimal consumption by preparing the medication pharmacopeia, a hospital supervisor said: "... We gave a list of antibiotics, which could be kept in the ward, towards, so the medication waste became very low and I think our consumption was well..." (Participant 15). Regarding the optimal consumption by monitoring, a supervisor said, "... I will warn if I see excess or inadequate electricity and nurses know they have to adhere and really do." (Participant 20).

Inappropriate consumption

Inappropriate organizational resource consumption was another category of the present research. The data of this subcategory was derived from three subcategories, namely "individual consumerism", "deviant consumption" and "compulsory extravagance". Some of the participants' statements are presented as follows.

Individual consumerism

In the field of using medical equipment available in the ward, most nurses in the clinical units expressed the nurses' carelessness in the use of medical equipment, pointing out that it led to a waste of organizational resources. A nurse talked about using the ventilator device: "Nurses take the ventilator, for example, and replace it by a serum, and then they forget it and their hand touch causes the serum pours into the ventilator, so it will be damaged if water penetrates it" (Participant 6).

Researcher's note when a nurse provided hospitality for the researcher: "A head nurse did me a favor and kindly washed the glass in the staff's relaxation room to give me tea, and the faucet

was open the whole time during washing the glass until washing was finished."

About the ointment waste, a nurse said: "The ointment can be demanded when it is finishing, but it is often prescribed more than their need, and not being re-prescribed after the ointment is over" (Participant 12). Another nurse said: "I have also noticed that nurses do not adhere to the use of glue, for example, they cut it far longer than what is needed, or for example, over glue to the dressing area or to fix the angiocatt." (Participant 3). About the paper consumption, another nurse said "... unfortunately, the paper use among nurses is too high. For example, labels of thermal printers in hospitals are highly used, and when you want to apply them to the laboratory, they labeled on the test container. It's too expensive, and a role costs about a hundred thousand Tomans (more than \$8)". (Participant 6)

Deviant consumption

Participants believed that the organizational resource consumption was not sometimes appropriate following the nurses' biased and profitable consumption leading to waste of organizational resources. A nurse in the intensive care unit also said: "Well, sometimes some nurses, for example, get upset about my behavior, become stubborn, and for example, do not adhere to their consumption or as they have not received their emolument, they try to avenge by overusing the resources..." (Participant 20).

Compulsory extravagance

Participants believed that there was a waste of organizational resources due to insufficient supplies, lack of appropriate supplies for patients, lack of facilities. A nurse said: "... When I want to put needle on a microset head, and there is no needle in the ward, I use the needle of a syringe, for example, a 2cc syringe, and put it on the microset head. I have no choice but to do so, not only me, but also all of my colleagues do the same" (Participant 18). A supervisor said, "Well, a drug vial like Meropenem, which can't be kept in the fridge and then reused, so it has no any dose for pediatric use and should be discarded after use, and almost a high volume of drug is discarded ..." (Participant 14).

Participants also noted that there was a loss of energy in cases with the lack of necessary facilities in which nurses did not play any role. In this regard, a hospital matron said: "... the hospital electricity system in corridors is in a way that we either have to turn on altogether or turn them off together; and as the whole corridor cannot be off, all the corridor electricity is on ...". (Participant 8)

Researcher note: "Head nurse turned off electricity in the ward, so the ward became dark, indicating the need for daytime use of electricity for nurses' work".

The dichotomy of organizational resources in the present study can be due to differences in nurses' and managers' views on the status of organizational resource consumption. For instance, Bahreini *et al.* assessed nurses' clinical competence from both nurses' and head nurses' perspectives and reported differences between nurses' and head nurses' views on nurses' clinical competence [12]. Other studies also indicated that there were differences in the viewpoints of nurses and managers in

organizations in cases such as barriers to patient education and nurses' clinical competence [13, 14]. The results somehow confirmed the existence of some differences in viewpoints of nurses in managerial positions and those working in the clinical department, similar to the present study.

In the present study, almost the majority of managers considered the consumption to be optimal, and most nurses expressed it extravagant, except for a few individuals who also expressed optimal individual consumption during service hours compared to the organizational resource consumption. However, according to clinical nurses' inconsistent opinions, the nursing managers' statements may justify their possible reluctance to perform management duties to supervise proper use or mismanagement of the consumption, or similar reasons to views of Adib Hajbaghery and Eshraghi Arani for the reason for this difference as follows: This disagreement may be due to low expectations of managers from nurses, ignoring the nurses' errors, or attempts to support nurses under their management in the organization [14].

The majority of nursing managers also believed that most nurses had appropriate use of organizational resources, and a few nurses also said that they properly consumed the resources due to their characteristics, like other studies that suggested that personality affected the performance [15] and responsible employees reduced organization costs [16]. According to results, nursing managers believed that organizational resource consumption was appropriate by taking measures such as supervision, training, and supplying adequate consumables as also reported in other studies [2, 17].

Despite the importance of medical equipment in the prevention, diagnosis, treatment, and education [18] and the need for proper management and maintenance of medical equipment in terms of health and education [4], the nurses pointed out the individual consumerism, and lack of attention to correct maintenance of medical equipment in the present study. In a study at two selected military hospitals in Iran, Ameriyoon *et al.* used a questionnaire to collect the necessary data. Their results indicated that only 24% of the respondents considered the appropriate overall status of medical equipment management organization in the hospitals [19]. Furthermore, Jadidi *et al.* reported that no training was provided for the installation and implementation of 21.7% of medical devices [4].

Since the research examined the nurses' viewpoints in different categories, nursing managers, contrary to the present study, were not been diligent in the management and maintenance of medical equipment. As a result, nurses who were subordinate to their managers did not properly utilize the medical equipment; hence, the lack of care of the equipment, as was pointed out by nurses, was confirmed.

On the other hand, hospitals are large energy users [20]; and nurses who are in the hospital for 24 hours and 7 days per week, play important roles in water, electricity, and gas consumption, but findings of the study indicated that the energy consumption in medical centers from nurses' viewpoints was sometimes optimal and sometimes inappropriate and extravagant. Findings of the research suggesting the extravagant consumption

according to nurses' views, were confirmed, but they were inconsistent with managers' views [2].

According to the findings of the present study, even though Iran was a drug importing country, resulting in currency withdrawal from the country [21] and its waste would result in public and government loss [22]. The nurses also reported the waste of drugs that was also reported by other researchers. Other studies also indicated that the consumption of certain types of serums, ampoules, and some drugs and consumables such as cotton, disinfecting solutions, and suction tubes were associated with extravagance [21, 23]. Due to this volume of wasted medicines in hospitals, a significant portion of the total budget of the department's medicines is wasted [24, 25]. Kazaoka *et al.* also found that nurses face problems due to the lack of attention to the unit of prescribed drugs by physicians and the inability to convert their theoretical knowledge to practical knowledge in the clinical service field [26].

In the present study, nurses pointed out that the overuse of paper, stationery, and other consumables leads to the waste of a portion part of the hospital's resources through wrong use and sometimes neglect. In hospitals, a part of organizational resources in the category of non-medical materials such as stationery is used for writing nursery reports, prescriptions, and letters. Zazuli *et al.* reported that waste papers, produced by health care centers, accounted for a large share of the daily waste paper production in a city [27].

Analyzing the data of the present study revealed that most participants believed that the consumables needed in some cases were insufficient in medical units, leading to the waste of other consumables. They also pointed out that inappropriate use of organizational resources was due to the lack of consumables proportionate to patients' needs, lack of necessary facilities such as inappropriate quality of consumables, and inappropriate workplace conditions and also the physicians' performance in some cases, leading to the waste of organizational resources. A literature review revealed similar results by other researchers. Attaran stated that consumables were not sufficient in hospitals [28], and Masoumbeigi *et al.* reported the physicians' performance was effective in drug loss [29]; hence, the finding was confirmed, and nursing use was inevitably inappropriate in some cases.

Conclusion

The results of the present study indicated that managers' views were inconsistent with the majority of nurses working in clinical units, and on the other hand, there was a contradictory attitude towards organizational resource consumption. Most nurses considered the organizational resource consumption method by nurses inappropriate and wasteful, but nursing managers described the organizational resource consumption as an appropriate and optimal consumption. Given that nurses, at the forefront of hospital services, directly used organizational resources and were closely linked to how their colleagues consumed the resources, it can be inferred that there was wastage

of organizational resources in the hospitals, but the wastage was either not high enough for managers to be aware of, or there was no proper monitoring system, or the managers were trying to support nurses under their management.

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