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Research Article

Impact on Patient Communication and Information after the Incorporation of white Boards in the Rooms of the Cardiology Hospitalization Units of four Hospitals

Short Title: *Impact of Whiteboards on Patient Communication*

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Abstract

Background/Aim: Effective communication between patients and healthcare professionals is crucial to ensuring optimal health outcomes. The study´s objective was to describe the impact on communication and information that patients have after the placement of white boards in the rooms of the Cardiology inpatient units of four hospitals.

Material and Methods: Quasi-experimental multicenter before-after study with a non-equivalent control group to evaluate the improvement in the information and communication received by the patient after the placement of whiteboards in the rooms of the cardiology hospitalization units of 4 hospitals, during the year 2021. All patients were included with the condition that they were over 18 years old of age with a minimum stay of 3 days. The variables to be collected were knowledge of the professionals responsible for their care, care objectives, procedures and/or tests to be performed, with a collection in two phases, and gender/age. The analysis is based on the characteristics of the variables.

Results: Total population =364, 176 prior phase and 188 after implantation, 39,8% women and 51,6% men. In the previous phase, the patients reported knowing the nurses 3,7% vs 96,3%, the nursing assistants 7,4% vs 92,6%, the doctors 31,4% vs 68,6%, the care goals 17% vs 83% and tests 13,8% compared to 86,2% later (p<0,001- Pearson's chi-squared value).

Discussion: The study confirms that whiteboards in patient rooms improve communication and healthcare staff knowledge. While the usefulness of whiteboards is acknowledged, the research couldn't directly compare their effects with other studies. Limitations such as incomplete patient satisfaction analysis and lack of sample randomization are noted. However, the multicenter design of the study strengthens its conclusions.

Conclusions: After placing whiteboards in patient rooms, there is an improvement in communication and in the information that patients admitted to the hospitalization units studied have.

Keywords: communication; nurse; whiteboards; information; goals of care; complementary test

Introduction

Effective communication between patients and healthcare professionals ensures effective patient care. Therefore, patient-centered communication is fundamental to guarantee optimal health outcomes. Achieving patient-centred care and communication in nurse-patient clinical interactions is complex due to the presence of institutional, communication, environmental, and personal/behavioural barriers.[1]

In this context, it is essential to highlight that effective communication fosters the establishment of trust, interaction, and the nurse-patient relationship[2], as this relationship enables joint decision-making and therefore has a positive impact on health outcomes.[3, 4].

Challenges still exist in this research area regarding new strategies that can diagnose and offer alternatives to improve communication between nurses and their patients in daily practice. [5].

The nurse-patient relationship is a helping relationship established with the patient and/or their family based on interaction, communication, respect for ethical values, acceptance, and empathy, aiming to foster introspection and behavior change. Key components include communication, active listening, and respect. Bioethical values and confidentiality must also be present to ensure that the relationship is built on equality and intimacy. [6] The nurse-patient interaction directly affects patient satisfaction and is essential for the delivery of nursing care. [7]

Care today requires a vital reconsideration towards humanising health, where care is situated ethically and professionally.[6]

This professional care is structured and formalized and aimed at meeting the needs of human beings with the purpose of promoting, maintaining, or restoring health. In this sense, it is essential for nursing professionals to demonstrate a high sense of commitment, loyalty, values, and humanism in delivering care to all who require it.[7]

Given the risk of dehumanization in patient care due to the administrative restructuring of most healthcare systems worldwide, it is necessary to reclaim the human aspect in clinical, administrative, educational, and research practices by nursing professionals. Nurses encounter various phenomena in their daily work that focus on the realities of the patients they care for, where, due to various conditions, there often isn't an opportunity for feedback between patient and nurse that would allow for the growth of this dyad and the strengthening of the care provided.[8] Additionally, there is a need to review the conditions under which humanized care is offered, the behaviors, and the perceptions of those involved. [8]. In this sense, it is important to highlight the differences in nurse-patient interaction regarding communication, with significant variability depending on the professional. Therefore, implications for staff development include teaching strategies that enhance symmetric nurse-patient communication.[9,10] For some time now, several scientific publications have demonstrated demonstrating increased patient satisfaction regarding communication and information received from healthcare professionals through the placement of whiteboards in patient rooms during their hospital stay. These whiteboards include the names of the professionals responsible for their care, the tests or procedures to be performed, and even the daily care goals aimed at ensuring the patient's proper progress[11].

This study aimed to assess the impact on patient communication and information following the implementation of whiteboards in the cardiology hospitalization units of four hospitals.

Materials and Methods:

A multicenter quasi-experimental before-after study without a control group was conducted to evaluate the experience of patients treated in the cardiology hospitalization units of the four participating hospitals following the placement of whiteboards in patient rooms. Sample size calculation was based on a reference prevalence of 50% from previous studies[11, 15], anticipating a 15% increase in patient satisfaction after implementation, with a desired power of 80%. This required N=162 patients per group across the four hospitals, with a bilateral alpha error 0.05. All patients over 18 years old voluntarily participating, with a hospital stay of more than three days and willing to answer the provided questions voluntarily, were included. Patients with mental alterations, incapacitated to respond due to health status without caregiver assistance, or incapable or unwilling to understand and sign the informed consent were excluded.

Data collection periods were divided into two phases: the first phase took place from October to December 2019, and due to the Covid-19 pandemic, which caused a project suspension, the second phase was conducted from May to October 2021. Data were collected simultaneously in all four hospitals during both phases.

Variables including gender and age were collected before and after whiteboard placement, along with patient awareness of the healthcare professionals responsible for their care (physician, nurse, nursing assistant), knowledge of planned tests or procedures, and understanding of nursing care goals defined as agreed-upon actions with the patient for daily implementation to improve health status.

Once placed, the whiteboard was to be filled out and reviewed by responsible healthcare professionals during each shift to ensure proper evaluation. Before the intervention, all involved healthcare professionals underwent awareness sessions emphasizing the importance of communication and patient information to enhance the hospitalization experience. Three sessions with the same methodology were conducted in each hospital to achieve this goal.

Statistical analysis involved presenting categorical variables with frequency distributions and 95% confidence intervals. Comparison analysis of variables was conducted using Chi-Square tests. Statistical analysis was performed using SPSS 25.0 software, with a significance level set at 5% ($p<0.05$).

All investigators and personnel involved in the project adhered to local and international ethical regulations for human experimentation, including the Declaration of Helsinki, the Belmont Report, and related documents. Approval was obtained from the Clinical Research Ethics Committee of Hospital 1 on 23/10/2019, with subsequent approval from the ethics committees of Hospitals 2, 3, and 4 in November of the same year.

Personal data handling complied with the European General Data Protection Regulation 2016/679 and the Spanish Data Protection Law 2018. Only the principal investigator accessed to the dataset, and databases were deleted upon study completion. The confidentiality of patient and third-party information was maintained as per Law 41/2002 on patient autonomy, rights, and obligations regarding clinical information and documentation.

Informed consent and information sheets were provided to all study participants.

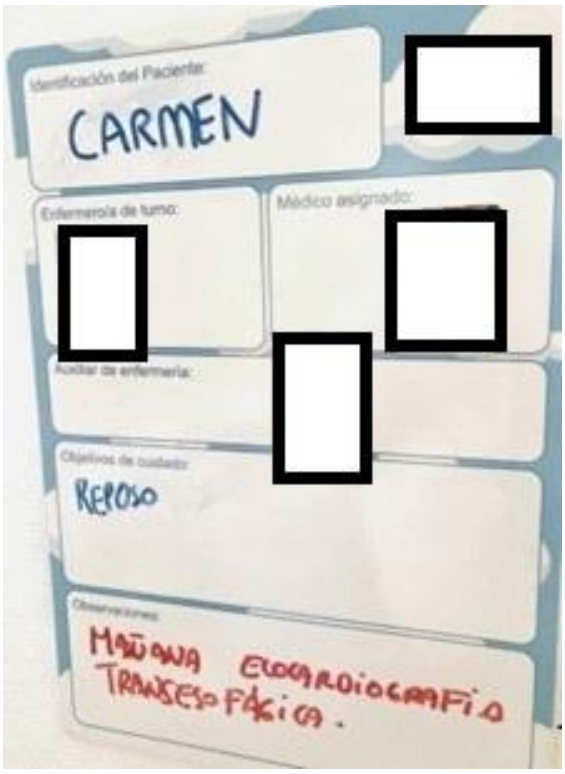

Figure 1: Image of a whiteboard placed in patient rooms at the different participating hospitals. Created by the authors.

Results:

Responses were collected from a total of 364 patients, of which 188 were after the implementation of the intervention and 176 were before to the placement of the whiteboards, with 39.8% being women and 60.2% men. The age distribution of the sample was as follows: 5.8% were under 40 years old, 19.5% were between 41-60 years old, 26.1% were between 61-70 years old, 28.6% were between 71-80 years old, and those over 80 years old accounted for 20.1%. The distribution among the four hospitals was 42.9% for Hospital 1, 22% of the patients belonged to Hospital 2, 20.9% to Hospital 3, and 14.3% to Hospital 4.

Before the whiteboards were placed, 81.8% of patients denied knowing the nurses responsible for their care, whereas after the placement, 96.3% claimed to know them ($p<0.001$). Regarding nursing assistants, 82.4% stated they did not know them before, while 92.6% responded affirmatively after the placement of the whiteboards ($p<0.001$). After the interventions were implemented, 68.6% of patients reported knowing their doctor, compared to 31.4% before the whiteboards were installed ($p<0.001$). After placing the whiteboards, 86.2% of patients reported knowing which tests would be performed during their hospital stay, whereas only 13.8% previously knew this information ($p<0.001$). Additionally, 83% of patients reported knowing the daily care goals after the whiteboards were placed in the rooms, compared to 17% who claimed to know them before this implementation ($p<0.001$).

GENDER		Whiteboard Implementation		
		NO	YES	TOTAL
WOMEN	Absolute frequency	76	69	145
	Relative Frequency	43,2%	36,7%	39,8%
MEN	Absolute frequency	100	119	219
	Relative Frequency	56,8%	63,3%	60,2%
TOTAL	Absolute frequency	176	188	364
	Relative Frequency	100%	100%	100%

Table 1: Distribution of the sample by gender. Self-made.

Table 2. Distribution of the sample by age. Self-made.

			Whiteboard Implementation		Total
			NO	YES	
AGE	Under 40 years old	Absolute frequency	12	9	**21**
		Relative Frequency	6,8%	4,8%	**5,8%**
	Between 41-60	Absolute frequency	32	39	**71**
		Relative Frequency	18,2%	20,7%	**19,5%**
	Between 61-70	Absolute frequency	45	50	**95**
		Relative Frequency	25,6%	26,6%	**26,1%**
	Between 71-80	Absolute frequency	48	56	**104**
		Relative Frequency	27,3%	29,8%	**28,6%**
	Over 80	Absolute frequency	39	34	**73**
		Relative Frequency	22,2%	18,1%	**20,1%**
Total		Absolute frequency	176	188	**364**
		Relative Frequency	**100,0%**	**100,0%**	**100,0%**

Table 2: Distribution of the sample by age. Self-made.

Pearson Chi-square Value: p = 0.746

Table 3. Distribution by hospitals of the sample

Implementation			NO	YES	Total
	HOSPITAL 1	Count	75	81	156
		% Within implementation	42,6%	43,1%	42,9%
	HOSPITAL 3	Count	40	40	80
		% Within implementation	22,7%	21,3%	22,0%
	HOSPITAL 3	Count	35	41	76
		% Within implementation	19,9%	21,8%	20,9%
	HOSPITAL 4	Count	26	26	52
		%Within implementation	14,8%	13,8%	14,3%
Total		Count	176	188	364
		% Within implementation	100,0%	100,0%	100,0%

Table 3: Distribution of the sample by age. Self-prepared.

Pearson Chi-square Value: p = 0.95

Outcome variables

Knowledge of nursing professionals by patients before and after the implementation of whiteboards in the rooms.

Table:4 Patient awareness of nursing professionals pre and post implementation of whiteboards in the rooms

Whiteboard implementation				
			Does not know	Yes, knows
NURSE	**NO**	Absolute frequency	144	7
		% Within implementation	81,8%	3,7%
	YES	Absolute frequency	32	181
		% Within implementation	18,2%	96,3%
Total		Count	176	188
		% Within implementation	100,0%	100,0%

Table 4: Patient awareness of nursing professionals pre and post implementation of whiteboards in the rooms. Selfprepared.

Pearson Chi-square Value: p < 0.001

Table 5. Patient awareness of nursing care technicians (TCAEs) pre and post- implementation of whiteboards in the rooms. Self-prepared.

Whiteboard implementation				
			Does not know	Yes, knows
TCAE	NO	Absolute frequency	145	14
		% Within implementation	82,4%	7,4%
	YES	Absolute frequency	31	174
		% Within implementation	17,6%	92,6%
Total		Count	176	188
		% Within implementation	100,0%	100,0%

Table 5: Patient awareness of nursing care technicians (TCAEs) pre and post- implementation of whiteboards in the rooms. Self-prepared.

Pearson Chi-square Value: $p < 0.001$

Table 6 : Knowledge of doctors by patients before and after the implementation of whiteboards in the rooms

Whiteboard implementation				
			Does not know	Yes, knows
Médico	NO	Absolute frequency	128	59
		% Within implementation	72,7%	31,4%
	YES	Absolute frequency	48	129
		% Within implementation	27,3%	68,6%
Total		Count	176	188
		% Within implementation	100,0%	100,0%

Table 6: Patient awareness of doctors pre and post implementation of whiteboards in the rooms. Self-prepared.

Pearson Chi-square Value: $p < 0.001$

Table 7: Knowledge of the tests being performed by patients before and after the implementation of whiteboards in the rooms.

Whiteboard implementation				
			Does not know	Yes, knows
Test	NO	Absolute frequency	77	26
		% Within implementation	43,8%	13,8%
	YES	Absolute frequency	99	162
		% Within implementation	56,3%	86,2%
Total		Count	176	188
		% Within implementation	100,0%	100,0%

Table 7: Patient awareness of the tests to be performed pre and post implementation of whiteboards in the rooms. Self-prepared.

Pearson Chi-square Value: $p < 0.001$

Table 8: Knowledge of care goals by patients before and after the implementation of whiteboards in the rooms.

Whiteboard implementation				
			Does not know	Yes, knows
Care objectives	NO	Absolute frequency	79	32
		% Within implementation	44,9%	17,0%
	YES	Absolute frequency	97	156
		% Within implementation	55,1%	83,0%
Total		Count	176	188
		% Within implementation	100,0%	100,0%

Table 8: Patient awareness of the care objectives pre and post implementation of whiteboards in the rooms. Self-prepared.

Pearson Chi-square Value: $p < 0.001$

Discussion:

Following the data analysis, the study´s initial hypothesis is accepted, allowing us to affirm that in the 4 participating hospitals where whiteboards were implemented in the rooms, patients felt better informed, and their knowledge of the healthcare professionals had significantly increased.

The distribution of the sample collected by sex and age is very similar to that reflected in other studies with similar characteristics, such as the one conducted by Goyal A. et al., where men accounted for 55% of the subjects and 69% were over 51 years old. [11], Similarly, these authors analyzed the knowledge of professionals by patients, as more than 95% of the patients found the valuable whiteboard in terms of information received upon whiteboard implementation. In another article by Singh S., et al. [12], they placed whiteboards in each patient room in the medicine wards of their hospital. They asked nurses and doctors to use them to improve communication with hospitalized patients. They subsequently analyzed the effect of these whiteboards by comparing patient satisfaction

with communication from medical wards before and after whiteboard placement with patient satisfaction with communication from surgical wards that did not have whiteboards. Patient satisfaction scores (scale 0-100) with communication significantly improved in the medical wards: nursing communication, physician communication, and involvement in decision-making. Patient satisfaction scores did not change significantly in the surgical wards. There was no secular trend, and the authors ruled out a trend in overall patient satisfaction, concluding that whiteboards can be a simple and effective tool to increase hospitalized patient satisfaction with communication. [12]. The placement of electronic whiteboards has been analyzed in other studies, such as the one conducted by Randell R. et al., titled "Electronic whiteboards:a review of the literature," published in Stud Health Technol Inform. 2015; 210:389-93., [13] in a systematic review conducted by Randell R. et al., they analyze the impact of electronic whiteboards on the care process, concluding that there is a lack of evidence regarding the impact on patient outcomes. Therefore, we cannot directly compare the data reflected in our study. However, they identify that white boards can contribute to improved information dissemination. In another article published by Skaggs M. et al., they analyze the importance of simultaneous interventions to enhance these outcomes. This recommendation is also being implemented in these hospitals but has not been analyzed for the current study [14].

Many limitations exist, methodological Biases mainly of our study would be the analysis of satisfaction among professionals and patients regarding the implementation of the whiteboards and their utility, as analyzed by the authors Sehgal NL. et al..[15], While the analysis of patient satisfaction is underway as part of the complete study, the decision to implement the whiteboards was made by the nursing teams themselves and not by unit leaders. Similarly, our study would have gained greater robustness through sample randomization and the inclusion of a control group. One of the strengths of our study lies in its multicenter design, which was conducted simultaneously in the four hospitalization units of the four hospitals. Additionally, hospital 1 is the only hospital with patients from a single medical specialty in its unit; the other hospitals have hospitalization units with various medical services, allowing us to analyze responses from patients with different health issues.

Conclusion

The placement of whiteboards in patient rooms achieved a dual objective. Firstly, it significantly impacted on patient communication with healthcare professionals and reduced variability in how information was conveyed to hospitalized patients. This led to the humanization of care and improved patient experience during their hospital stay. Similarly, the involvement of the entire healthcare team is a fundamental pillar for the tool's effectiveness, requiring action plans to be developed within the team rather than imposed by management

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