

Evaluating patient safety: Analysis of adverse events in hospitals in Hidalgo

Evaluando la seguridad del paciente: Análisis de eventos adversos en hospitales de Hidalgo

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Abstract:

This descriptive observational study analyzes adverse events in public hospitals in Hidalgo between 2013 and 2021. The main objective is to understand patient safety at the local level using data from the Adverse Event Recording System. Data from 1,830 surveys from 14 hospitals were collected, focusing on sociodemographic, clinical, and hospital service variables. The results indicate a higher prevalence of adverse events in women (59.78%) and in the age group of 21 to 30 years. The most common places of occurrence were Internal Medicine and Hospitalization, mainly during the morning shift. The most frequent incidents were medication-related, falls, and infections, with a majority classified as 'no harm'. Patient characteristics and the application of protocols are identified as factors most commonly present in adverse events. However, only 2.02% of the events underwent a root cause analysis. The study highlights the need to develop specific strategies for prevention and reporting, emphasizing continuous education of medical staff the strengthening of hospital policies, and the consolidation of information on adverse events for future research.

Keywords:

Health information, incident, reporting

Resumen:

Este estudio observacional descriptivo analiza eventos adversos en hospitales públicos de Hidalgo entre 2013 y 2021. El objetivo principal es comprender la seguridad del paciente a nivel local utilizando datos del Sistema de Registro de Eventos Adversos. Se recopilaron datos de 1,830 encuestas de 14 hospitales, enfocándose en variables sociodemográficas, clínicas y del servicio hospitalario. Los resultados indican una mayor prevalencia de eventos adversos en mujeres (59.78%) y en el grupo etario de 21 a 30 años. Los lugares más comunes de ocurrencia fueron Medicina Interna y Hospitalización, principalmente en el turno matutino. Los incidentes más frecuentes fueron de medicación, caídas e infecciones, con una mayoría clasificados como 'sin daño'. Se identificaron las características del paciente y la aplicación de indicaciones como factores mayormente presentes en los eventos adversos. Sin embargo, solo el 2.02% de los eventos se sometió a un análisis de causa raíz. El estudio resalta la necesidad de desarrollar estrategias específicas de prevención y reporte, enfatizando la educación continua del personal médico y el fortalecimiento de políticas hospitalarias y la consolidación de información sobre eventos adversos para investigaciones futuras.

Palabras Clave:

Información en salud, incidente, reporte

INTRODUCTION

The safety of a patient is a main element of medical attention, fundamental in the world scenario, and a constant challenge to health institutions.

Quality care is a concern comprehended by low and middle-income countries until high incomes, so it considerably affects the damage load due to deficient care. Worldwide, it estimates that "hospitalizations in low and middle-income countries conduct annually to 134 million advert events contributing to 2.6 million deaths"¹.

A study done by the Agency for Healthcare Research and Quality(AHRQ) shows that adverse event rates related to the security of patients decreased considerably in the previous decade at the beginning of the pandemic of COVID-19.From 2010 to 2019, this study examined almost 245,000 patients in more than 3,100 hospitals and found relevant reductions in the adverse events rates for patients with cardiac diseases, pneumonia, and major surgical procedures².

In Latin America, a systematic revision of the studies that employ a Patient Safety Culture Survey of Hospitals(PSCSH) revealed that the patient's safety culture is understood as the

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collective and firm compromise of all the organization to ensure and encourage actively the patient's safety is a relatively unknown concept or no measured in most of the countries of the region.

The studies contemplated in the review come from Argentina, Brazil, Colombia, Mexico, and Peru, with 10,915 participants, most nursing personnel. Observing a low positive perception of 48% of the culture of the patient's safety. The dimensions of Patient Safety Culture with a greater number of positive answers: are "organizational learning" and "teamwork within the units". Those with less quantity of positive answers were "non-punitive response to error" and "availability of personnel"³.

In this sense, the present research comprehends patient safety to a state level from the data registered within the Adverse Event Recording System (AERS) to provide valuable and updated information to identify and approach the causes of advert events⁴.

The absence of detailed reports on the available variables in (AERS)limits the capacity of analysis and informed decision-making by the quality managers of the hospitals and public health policy planners. As a result, this study is relevant to describe the health service quality in Hidalgo in a specific period and contribute to the enrichment of knowledge about patient safety facilitating the adaptation of continuous improvement strategies in diverse contexts addressed.

METHOD

An observational descriptive study focused on adverse events analysis in public hospitals in Hidalgo from May 2013 until December 2021. It collected data from 1,820 surveys with more than 70 information domains. Selecting those adverse events reported in the period established and excluding those incomplete or unverifiable registers.

The data came from the registers of the following public hospitals of the State of Hidalgo. For instance, the General Hospital of Pachuca (762 registers), the Obstetric Hospital (271), the Villa Ocaranza Psychiatric Hospital (256), the Regional Hospital of the Valle de Mezquital (109), the General Hospital of Tulancingo (101), the General Hospital of Tula (69), the Cinta Larga Integral Hospital (67), the General Hospital of Actopan (45), the Integral Hospital of Otomí-Tepehua (43), the Regional Hospital of the Huasteca (39), the General Hospital of Apan (32), the General Hospital of Huichapan (17), the Integral Hospital of Jacala (11), and the Integral Hospital of Tlanchinol (8). It used Pythonan (Selenium) an algorithm to recollect and structure data, and ensured accuracy through the pilot tests and consistency reviews. Moreover, implementing computing resources for the process and analysis of the data with the statistical software R.

From an ethical point of view, the study complied with the Regulation of the General Health Law on Research for the Health of Mexico⁵. The research clarified without the risk of implementing the retrospective techniques without intervention or modification of the variables of the people involved. The institutional approval was obtained by the Direction of Professionalization in Health and Quality in the Service of the State of Hidalgo.

RESULTS

The following presents a characterization of the patients who experienced adverse events, using the sociodemographic variables and those related to the hospital care for further analysis.

Sociodemocratic Variables

Table I shows a higher percentage of adverse events registered in female patients (59.78%). In comparison with the males (40.22%).

Table I. Distribution of adverse events according to gender

Gender of the patient	Number of events	Percentage (%)
Female	1,094	59.78%
Male	736	40.22%
Total	1,830	100.00%

Source. Own authorship with data gathered from the Adverse Event Recording System

Regarding the age of the patients, table II shows that most of the adverse events are focused on the group between 21 to 30 years, followed by the groups from 51 to 60, and finally the one from 61 to 70 years. The groups of minor and senior ages(<10 y >80) represent the lowest percentages of adverse events.

Table II. Distribution of adverse events according to gender

Age category	Number of events	Percentage (%)
Minor of 10	144	7.87%
10 to 20	153	8.36%
21 to 30	394	21.53%
31 to 40	235	12.84%
41 to 50	218	11.91%
51 to 60	267	14.59%
61 to 70	244	13.33%
71 to 80	100	5.46%
Senior of 80	67	3.66%
Not specified	8	0.44%
Total	1,830	100.00%

Source. Own authorship with data gathered from the Adverse Event Recording System

Features of hospital care

The hospital care variables analyzed were where the event occurred, the shift of occurrence, the type of personnel who witnessed the event, the type of incident, and severity (Table III).

Table III. Distribution of the adverse events according its features of hospital care

Features of Hospital Care	Number of events	Percentage (%)
Place of the event		
Internal Medicine	427	23.33%
Hospitalization	422	23.06%
Gynecologist/Obstetrician	240	13.11%
Urgencies	147	8.03%
Pediatrics	108	5.90%
Shift of occurrence		
Morning	915	50.00%
Night	400	21.86%
Evening	278	15.19%
Accumulated working day	237	12.95%
People who witnessed the event		
Nurse	763	41.69%
Other	625	34.15%
Physician	375	20.49%
Total	1,830	100.00%

Source. Own authorship with data gathered from the Adverse Event Recording System

Concerning the place of occurrence of the adverse event, the higher occurrence was registered in the area of “Internal Medicine”, with 427 events that represent a total of 23.33%. Closely followed by the area of “Hospitalization” with 422 events, equivalent to 23.06% respectively.

About the shift, it is notorious that half of the adverse events from the 915 cases, or 50% of them, occurred in the morning shift. Whereas, in the night shift, with 400 events, equivalent to 21.86%. At last, in the evening shift, with 278 events, equivalent to 15.19%, also shows a considerable frequency.

Concerning those who witnessed the event, the nurses are the major witnesses of these occurrences with 763 cases, equivalent to 41.69%. Other witnesses, probably include the members of medical personnel, and possible patients or visitants, adding to 625 events with an equivalence of 34.15% respectively. The physicians observed 375 events with an equivalence of 20.49%.

Classification of adverse events

Table IV discusses the adverse events according to the type of incident that occurred, the gravity, related factors, a root cause analysis, its evitability, and whether taking subsequent actions to improve the identification of the adverse event.

Table IV. Distribution of the adverse events according its reported characteristics

Classification of adverse events	Number of events	Percentage (%)
Type of Incident		
Medication Incident	797	43.55%
Falls Incident	311	16.99%
Incident of infection associated with medical care	247	13.50%
Type of severity		
Unharmful	651	35.57%
Low	640	34.97%
Moderate	498	27.21%
Severe	25	1.37%
Death	16	0.87%
Factors of the incident		
Characteristics of the patient	1,175	64.21%
Application of indications and protocols	638	34.86%
Teamwork	349	19.07%
Root Cause		
A root cause analysis was done	37	2.02%
Avoidability		
Events considered avoidable	1,429	78.09%
Actions of Improvement		
Post-event corrective action	1,426	77.92%
Total	1,830	100.00%

Source. Own authorship with data gathered from the Adverse Event Recording System

It was remarkable that all the adverse events registered 1,830 with an equivalence of 100%. It is relevant to mention that information was given to the patients or their relatives about the adverse event. With regards to the type of incident, medical incidents have the highest number of cases with 43.55%, followed by the Falls incidents with 311 events, equivalent to 16.99%, lastly, the incidents of infection associated with medical care with 247 events, equivalent to 13.50%.

In terms of the type of severity, most of the events are “unharmful” adding to 651 cases, with an equivalent of 35.57%. Concerning the low and moderate severity 640 common cases, equivalent to 39.97%, and 498 events with 27.21%. The severe and death cases are less frequent than the previously mentioned, with 25 cases, equivalent to 1.37%, and 16 cases (0.87%).

With regards to the factors of the incident, 1,175 events are emphasized a total of 64.21%. It is crucial to mention that the patients' characteristics play an important aspect. Additionally, the factors related to the application of indications and protocols had great importance (638) events equivalent to 34.86%.

Regarding the root cause analysis, a minor case was found, only 37 events with 2.02%. Referring to the avoidability of the adverse event, a major proportion of events was found with 1,429 cases in total (78.09%); they were considered potentially avoidable. As far as actions of improvement, with a total of 1,426 events, equivalent to 77.92%. Some corrective actions were taken from the 618 with the strengthening of the culture of quality and security of the patient, 440 cases connected with the implementation of oversight mechanisms, and 380 with the training of new personnel and students.

CONCLUSION

Based on the contribution of this current study about adverse events in the hospital environment, has let us know the potential and key areas to improve patient safety management in the State of Hidalgo. The analysis was developed exhaustively, taking into consideration not only the frequency and diversity of the adverse events but also a detailed categorization of these. Furthermore, it included the dimension of the incidents related to medication and falls, until the factors of consideration such as the patient's particular characteristics, and the effectivity in the implementation of the hospital protocols.

To underscore one of the most remarkable results obtained, female patients had the prevalence of these events at 59.78%, with a significant concentration in the age group from 21 to 30 years.

According to the research conducted by Watson et al (2019) contents within the VigiBase, the database of the World Health Organization, the global reports about the individual safety of patients based on the registers of the period from 1967 to 2018," was a major quantity of reports of adverse actions to medications taken by women from all regions worldwide"⁶.

As stated by Inusah et al (2020), for those patients whose main hospital is located in the upper west region of Ghana, it was found that the adverse events increase according to age. The group from 21 to 30 years represented a major proportion with 8.7%. These findings show the urgent need to develop specific strategies for prevention and management focused on these demographic groups⁷.

Based on the characteristics of the hospital service, most of the adverse events produced in areas, for example, Internal Medicine and Hospitalization, mainly during the morning shift. Morales Morales Words et al (2019) and Barrera (2010) found that hospitalized patients in internal medicine services are more exposed to adverse events⁸⁻⁹.

Regarding the morning shift, Echevarría mentioned et al (2011) that a surgery service had a major quantity of cases with 77% just for this shift, which it is vital to take this value with caution since there is a higher number of trained personnel available¹⁰. Nonetheless, these results show the importance of reinforcing security measures and the quality of these relevant aspects.

About the classification of the events, medication, falls, and infection incidents are highlighted especially those associated with medical care, the most frequent with most of the events classified as "unharmful". Although it is a notorious incident of low and moderate severity.

According to the study of patient safety in primary health care (APEAS, 2008). Having primary health centers (48) in Spain can be appreciated closer numbers for these results. Only 7.3% of the adverse events are considered severe, while medication is a cause of the adverse events (25.7%)¹¹.

One of the critical aspects identified in the contribution of the characteristics of the patient and the application of the indications and protocols of occurrence of adverse events. Besides its coordination with the correct execution of the mitigation guidelines of the events. Based on that Paranaguá et al (2014) highlight the importance of encouraging the creation and use of tools to notify the incidents since they not only facilitate the efficient management of health services but also allow the identification and the proactive approach to those aspects that require improvements in the **working environment**¹².

Despite a considerable proportion of the analyzed events, it was considered avoidable with only 2.02% of the cases being subject to a tool cause analysis, which was a great opportunity for improvement in the prevention and analysis of adverse events. As stated by Rodríguez & Rodríguez (2021), they pointed out that the causal analysis of adverse events can notice and correct hidden failures and mistakes in the process of medical care, as well as allow development strategies that avoid future incidents, thereby contributing to a safer and more reliable clinical environment¹³.

Taking as a reference the present study, future investigations could focus on expanding strong methodologies to the analysis of incidents and evaluating the impact on diverse strategies to prevent and report the same. Moreover, it would be useful to research the impact of the existence of certain adverse events over a long time on both the performance of the given services and the patient safety culture of health personnel.

From a more practical and indirect perspective, the importance of continuous education and training of medical personnel is emphasized, as well as the encouragement of politics and hospital protocols. Because of the implementation of actions of monitoring incidents, operational supervision, and the development of programs of quality and safety for the patient are seen as decisive steps to a continuous enhancement.

A current challenge resides in the access to health information that details adverse events, particularly the limitation of the Adverse Event Recording System to generate reports with the disaggregated data, resulting in the restriction of the capacity of the decision-makers of the hospitals and state institutions of health to do a deep exploration of the most common causes of these events. It requires an effort to consolidate the data to a state level to enhance researchers by the key participants of the public health system and also enrich the monitoring of the current situation of patient safety in health systems.

In conclusion, this study provides an integral vision of the adverse events in the hospital environment highlighting relevant areas to improve the patient's safety, and opens ways to future investigations and practices done in clinical units due to its continuous approach, promising important advances in the quality of health services.

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