Big Data Analytics in Handling Mechanisms of Transforming Healthcare Performance: An Approach Technological Management in Addressing Nurse Workloads in Emergency Department

by Andries Lionardo

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Abstract

Background: The importance of science related to Big Data was a need in overcoming the performance problems of health professionals to overcome disease healing for clients in the hospital. The understanding mechanism of Big Data in nursing will certainly positively impact the client's recovery process during treatment in the hospital. Purpose: This study aims to find out how the Big Data mechanism can be applied in overcoming the performance of health workers in providing professional nursing care to clients. Methods: This research uses quantitative methods to measure Big Data's health mechanisms' degree of understanding. To obtain the common research finding, researchers used cross-sectional analysis. Meanwhile, to get valid results during the study, the researcher uses observational analytics techniques Result: Healthcare professionals were expected to understand Big Data and knowledge mechanisms in addressing client care. This can be seen from the research results that explain that (n) p-value (≤ 0.05), which means that understanding Big Data was essential in knowing how efficiently caring the clients' health. Conclusion: Big data analysis is indispensable in health sciences at this time. Health data recorded in the database can help clients overcome health problems, especially those in the community. In addition, the work experience and ability of nurses to analyze Big Data medical records will undoubtedly have an impact on the rapid recovery of patients in hospitals.

Keywords:
Big Data, Healthcare, Technological Management, Nurse, Performance

1. Introduction

The importance of health for the community will undoubtedly affect improving a government area's quality of life. Good physical condition and good mental condition are necessary for each individual to continue to carry out productive activities. Healthy living behavior for every member of society is broadly supported by public health, with

regular health care as a preventive health effort to achieve a fair degree of public health. To achieve this quality service, every health institution must have an integrated health data center to understand health patterns to handle public health properly.

Optimal health services that are supported by quality health personnel facilities in the future will undoubtedly increase the high level of health for all people by prioritizing the needs of the community as consumers. Therefore, health workers such as nurses must implement technology in work by prioritizing public health needs through professional health services. Indeed, technology's role must support health development in a country to improve health worker's performance. This health technology can help institutions analyze clients who have been a treat at the hospital. This health technology is updating data on clients and the increase in the number of recovered patients. The Big Data used can certainly help health workers develop themselves professionally in working professionally. The implementation of technology-based health services can undoubtedly be a reference for clients in health technology-based medicine following the technological era that we are facing today

In improving the quality of service for clients who take care of their health in the hospital, health professionals such as nurses must always increase their knowledge about improving client best service. Therefore, with the change of technology in health at this time supported by Artificial Intelligence technology sophistication, it is undoubtedly beneficial for health workers to always improve their science in care and medicine. According to Giovanelli et al. (2020), technology is influential in healthcare workers' pattern of knowledge. Therefore, technology and health are interconnected things that can provide health services for patient's treatment.

Data shows that health professionals who work in hospitals and work in emergency installation departments already have experience. Besides, the workforce already has a certificate of competency of expertise working as a health professional. Therefore, technological advances such as at this time supported by the ability of computer technology that can store many data can undoubtedly help health workers in analyzing experiences and things that occur during patient care.

Big Data in health is essential in health science as an effort of health workers in addressing issues related to improving the quality of health for the whole community (Nasirin and Lionardo, 2020c). Health workers will undoubtedly utilize the ability to analyze big health data in analyzing health and as an effort to reduce anxiety for patients who have chronic diseases. The principle of significant data work and the experience of health care that has been done before can be more effective and cause confidence for all health workers in treating clients in hospitals.

2. Theoretical Framework

Knowledge gained through health technology is undoubtedly beneficial for clients in increasing confidence for more effective health recovery. Therefore, through the understanding of big data analysis, health workers can overcome problems related to how to overcome public health by combining health knowledge and technology.

Improving the cognitive knowledge for health workers can be done by improving health workers' ability based on the length of work and applying technology to enhance optimal health. According to Horenberg et al. (2020); Lionardo and Nasirin (2020); the application of health technology combined with science will produce optimal health services quality. The application will be interpreted as individual health professionals' ability to apply their knowledge to the actual situation and conditions. The application can be a formula of health technology and the right method to overcome health-related problems in society.

Based on this, technology and knowledge are two things that are interpreted as the ability of health workers in describing an object of health in improving the quality of health for all people. The ability to analyze and evaluate performance assessments for health workers is an essential part of today's thriving health world.

Several factors can influence health workers' knowledge in helping health care for their clients, such as the level of knowledge obtained by health workers that positively impact education. With a good experience and supported by a good education, analyzing the big health data will be more comfortable and affect the community's optimal health quality as users of these health services. According to Horenberg et al. (2020), personal health management will influence health workers' ability to analyze big health data in improving the quality of services in the community.

Mechanisms in transforming the data of clients who have undergone treatment at a hospital must certainly be monitored as patient record data whose purpose is to overcome the pattern of care given next easily. Therefore, health professionals' behavior in providing nursing care is a manifestation of attitudes that must help clients address patient care problems to recover from the disease they suffer. Nasirin and Wahyuningsih (2020) say that the effective way to handle clients is undoubtedly inseparable from health workers' analytical data in assisting clients in care. In contrast, the treatment mechanism that is carried out must be following health procedures and based on Big Data's analysis data. With the structured treatment procedure, the client's treatment process will be more quickly to overcome.

Several factors influence the existence of Big Data in health analysis, such as every health worker should be able to give optimal attention to patients' healing during treatment. Then, respond to patients' complaints in therapy and provide solutions during the healing period by giving clients' complaints due to felt during the healing period. The performance of nurses in providing nursing care is indispensable in the care of clients in hospitals. This is also an effort to achieve performance that must be done by all professional health workers by guided by summarizing health analysis data from the clients mentioned. Recording health data can undoubtedly be an overview of the achievement of the implementation of care services for clients to feel comfortable during the treatment process.

The use of technology and experience from health workers, of course, nursing care process carried out by health workers is a process of health services as an effort to meet basic human needs based on the methodology of the optimal health care process and based on the standard of care based on ethics responsibly. The nursing process is a scientific activity carried out systemically and responsibly so that clients who undergo a healing period can be optimal during the treatment period.

According to (Rosing et al., 2020) the assessment conducted using Big Data will help clients in-hospital treatment. Besides, the pattern of treatment carried out by health workers is undoubtedly a diagnosis based on the client health data record obtained from the big data mentioned. The diagnosis is indeed a combination of work experience done by professional health workers and medical records in Big Data from the application of technology carried out by these health institutions. Further, Nasirin and Lionardo (2020b) explained that the implementation carried out by health workers is an experience that has been done during work and a combination of health technology that becomes an application in supporting the improvement of optimal health quality as an effort to improve the quality of health in the community.

In supporting the quality of service for clients who need optimal care, hospitals are the right treatment choice. Hence, the health care center has a complete health facility with optimal health technology tools. Hospitals and healthcare places for clients also have standards of service that are in accordance with the procedures of service that have been tailored to the needs of health care for all clients who come to the hospital for treatment.

Hospitals are also places of health research that can add new knowledge in health sciences as well as an optimal health care place. By applying health knowledge combined with health, technology will improve the quality of health for all people in the future. Therefore, with Big Data's implementation, past health care experiences can be recorded well and learned in the future.

3. Methods
The research method used in this study used a quantitative approach with 22 respondents and a sampling technique using non-probability sampling to obtain the desired results from the research subject. Simon et al. (1997) stated that using scientific methods to obtain data with the aim of research could be following the hypothesis tested. This study's subjects are health professionals who have worked for more than five years and have understood analytical techniques using Big Data with computer technology that has recorded data to be a source of research data. This study's population is all members of the group of health professionals and work in health institutions that have been appointed as sampling research.

Samples used are the entire population of the hospital as a source of information and other data sources. The examples in this study are all health professionals with more than five years of experience and the ability to analyze documents from big data records that have been previously designed by researchers. Sampling techniques used to obtain data are done using non-probability sampling. The method was carried out so that the expected research results can be accurate. Therefore, to get accurate data, researchers also use analytical observational methods by observing every new
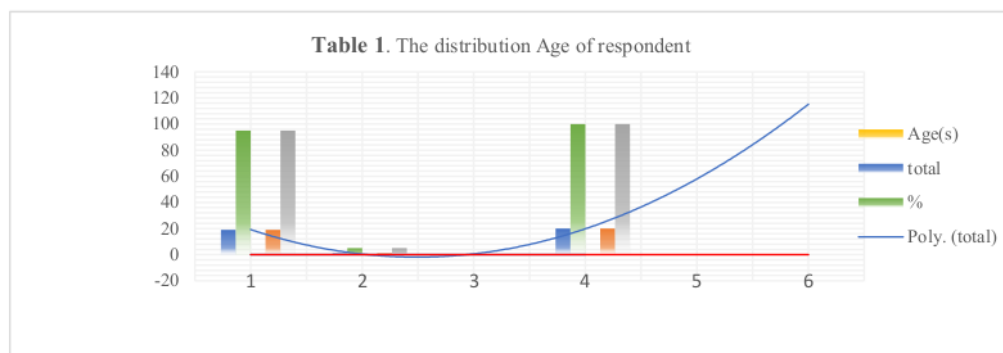
phenomenon ongoing and intervening in the relationship of research with supporting variables to be useful. After all the data's completeness, then processed using analytical techniques with the chi-square test.

In this research, the data analysis technique uses non-parametric statistical analysis using the chi-square test to find the relationship between or test the significance of hypotheses. The proposed theory is accepted, and there is a relationship between one another variable. In identifying the results, to obtain the relationship of variables observed, both variable independent and dependent variables aim that the processing of expected results from the study can get valid results.

4. Result and Discussion

The application of technology in health is essential to improve the quality of health services for clients who carry out hospital treatments. Similarly, the application of big data in the medical field will undoubtedly impact the high recovery rate of patients undergoing treatment.

Based on the research location description, some significant findings presented in this study's results are observing the age of respondents and health knowledge using Big Data analysis and how to transform the experience in improving health professionals' performance. Suppose the distribution data is measured based on health professionals working in hospitals for more than five years. In that case, the health officer can generally operate following the procedures of handling clients well. Then the health workers have also been able to analyze health care using Big Data analysis. Data from health workers' observations is always associated with data recorded in big data to remain analyzed first before conducting client care based on health patient records to get the expected results.

Table 1. The distribution Age of respondent

The table above explains that the professional workforce who work at the hospital has a productive age to work between 22-35 years (92 %). Further, the health workers' age can undoubtedly affect treating patients correctly and adequately. The ability to analyze the behavior during the healing period can appropriately do following health care procedures. The better knowledge of health workers to explore the way of care will affect public health quality.
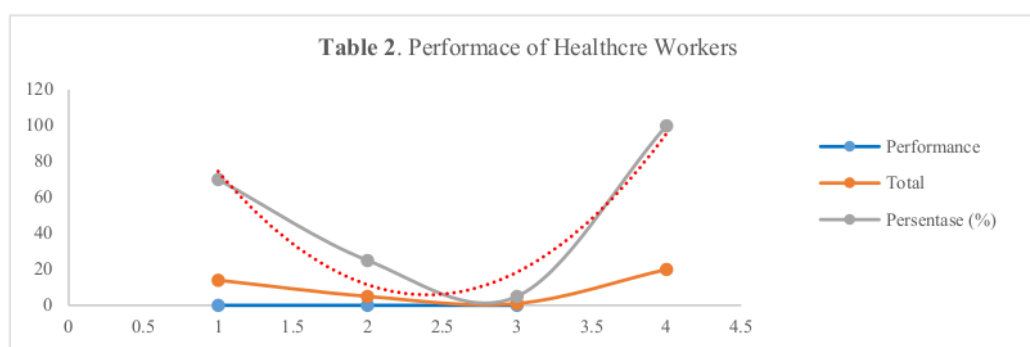
Further, the health care respondents were usually examine based on gender; generally, the health workforce was male (55%). The data shows that the high workload at these hospitals certainly requires a male working to help clients undergoing treatment.

Analysis of the knowledge of nurses with the performance of health workers in providing nursing care in the emergency room at the hospital, based on the results of the study explained that in delivering nursing care from 20 health workers, the professional is generally able to work well following the established performance procedures. Data shows that 65% of the total health workers are working well and with more than five years of work experience. Therefore, health knowledge obtained during education in health colleges will undoubtedly help clients during the hospital's disease treatment.

The good comprehension of nursing care knowledge, the better the understanding of healthcare professionals, and how the correct client care will impact healing more effectively. Therefore health knowledge is significant for health workers in providing care for all clients. Thus, a good nurse's experience is very influential in nursing services, given nurses where good knowledge will affect a health worker (Nasirin and Lionardo, 2020a). In line with this opinion,

nurses' experience is significant in providing nursing care to patients. On the other hand, nurses' attitude about health care is a reaction or response shown by nurses to stimulus or objects in planning stages, health implementation.

When viewed as health workers' professionalism based on their general experience, they have worked more than five years and can handle clients better. In addition to performing, they can also analyze work based on health cases that he has done as a skilled health worker at the hospital. Data shows that 25% of health workers have worked for more than five years, meaning that the health institution must provide additional knowledge in special skills training so that all health workers can work better. According to Nasirin and Lionardo (2020b), performance is a function of motivation, opportunity, or work environment, while motivation is built by the personality. Therefore, performance is an overview of the program of the organization's strategic planning activities in improving the institution's quality. The performance of health workers in providing care is determined by nurses' knowledge and attitude in applying operational standards of procedures given to patients and families of patients. Based on the explanation above, the better the nurses' knowledge and positive attitude, the better nurses' performance in providing nursing care to patients. In line with this opinion, good performance greatly contributes to improving health care according to operational standards.

Table 2. Performace of Healthcre Workers

Analysis of the performance in providing nursing services for health workers is based on the results of chi-square test and to get the result of study comparative by using SPSS program version 22 to explain the relationship among knowledge and performance of health workers with a value of p (0.015) with a significant value of 0.05. The study results show that health workers' better knowledge, the better performance of healthcare professionals in providing nursing care to the clients. Therefore, the more positive attitude of health professionals to the clients, the better their understanding of healthcare workers in delivering healthcare to patients.

Based on the explanation above, there is a significant relationship between health knowledge and performance in providing health care emergency department with P-value chi-square value (0.015) < (0.05) Ha, respectively. Health workers' experience about health care being classified as acceptable and the most performance is positive. (Zhao et al., 2020) stated that the health services in its implementation are a nursing practice that is the independent action of professional nurses through collaboration with clients and other health workers in providing nursing care according to the environment of authority and responsibility. Nurses who are quick to respond in providing services will cause patient satisfaction with the perceived benefit. The rapid response is the nurses' promptness in providing services to patients either directly or only provide information quickly and precisely when the patient needs it. A good service is a service provided in a reliable, precise and accurate, friendly and understand patients' wishes. According to Pettersson et al. (2020), mention good service means hearing patient complaints, greeting patients, and other attentions limited to nurse-patient therapeutic relationships. From the explanation above, the nurse's more positive attitude and better nursing care can be given to patients. Therefore, nurses' positive attitude is very influential for nurses' nursing services because it can provide a comfortable and satisfying impression to the patient towards the waiter given a nurse.

5. Conclusion
The results showed that the utilization of big data in health services in emergency departments in hospitals is essential. Some research findings can be the next discussion material for other researchers, such as implementing health workers' performance in providing health services can be an example for other health workers, especially in delivering health services in the community.

Based on understanding how to analyze the Big Data treatment process for clients treated in hospitals, hospital care officers have diagnosed the way of care by the client's health problems. From 20, health professionals who work in hospitals to explore treatment that suits the patient's condition. Following health knowledge obtained during education, healthcare professional workers must understand the appropriate way of handling clients correctly and how to analyze the big health data that health workers must do in treating patients suffering from diseases in hospitals.

Health workers' performance in providing adequate care always uses analysis based on big health data so that the treatment done to clients can be following the standards of health care procedures. In addition to adequate service procedures, general health professionals have been working as professional nurses for more than five years to be generally able to cope with clients well.

The study results show that big Data will undoubtedly be beneficial for health workers in overcoming public health. Analysis by chi-square method that the value obtained is P (0.015 and 0.004) < 0.05. Understanding the analysis using Big Data can be understood by health workers, especially those who have completed professional health education at university to help care for clients in the hospital.

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Biographies

Chairun Nasirin is a lecturer at College of Health Sciences (STIKES Mataram), Indonesia. His research is related to health administration and health policy. Some of his research interests include health administration, community nursing, empowerment, health policy, and public health.

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