



Analysis of the Implementation of Infection Prevention and Control (PCU) Program in the Inpatient Room

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Abstract: This study aims to analyze the application of the infection prevention and control program (PCU) in the inpatient room of the Meuraxa Regional General Hospital, Banda Aceh City. This research is an observational analytic study with a cross-sectional approach with a total sample of 184 respondents who are permanent nurses in the inpatient room of the Meuraxa Regional General Hospital, Banda Aceh City. This study used primary data through distributing questionnaires which were conducted in July 2023. Correlation analysis used statistical contingency coefficient tests and Multiple Logistic Regression tests on multivariate variables. The results showed that gender ($p=0.033$), age ($p=0.004$), and length of work ($p=0.024$) had a correlation with the implementation of the PCU program in the inpatient room. The Multiple Logistic Regression Test showed that the implementation of the PCU program was 2.79 times higher for female respondents and 2.37 times higher implemented at age 26 - 35 years. This study shows that gender, age, and length of work have a significant correlation by implementing an infection prevention and control program (PCU) in the inpatient room of the Meuraxa Regional General Hospital, Banda Aceh City.

Keywords: Infection prevention and control; Program; Nosocomial infection nurse

Introduction

Standard health services are currently one of the focuses of attention in the world of health. The quality of implementation and provision of health services has become a demand for service providers and needs for the community (Rafi, 2019). This condition is the background for the preparation of health service quality indicators in several countries to be applied to health service providers in their respective regions so that they have the same level (Raofi et al., 2023). Patient safety is a fundamental part of health care outcomes. The Ministry of Health of the Republic of Indonesia defines patient safety in hospitals as a system regulated by hospitals in providing patient safety care through assessment, identification and management of patient risks to minimize the incidence of injury or illness due to

inappropriate decisions or actions taken (Anni, et.al, 2020).

Uncertainty about the outcome of health services has caused concern in various countries, so that the point of patient safety has become one of the discussions at international meetings, namely the World Health Assembly (WHA). The World Health Organization South-East Asia Region (SEARO) has made a regional plan regarding patient safety in 2016-2025. (SEARO, 2015) One such planning strategy is the prevention and control of nosocomial infections. Indonesia is one of the countries that fully supports this planning strategy through policies regulated in the 2011 Minister of Health Regulation (Mita et al., 2022).

Nosocomial infections or Healthcare Associated Infections (HAIs) are infections acquired by patients after receiving non-existent health care or not in the incubation period at the time of admission to the

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hospital. Included in this definition are infections that first appear within 48 hours or more of hospitalization or within 30 days of receiving health care (Astuti, 2020).

A study conducted by the World Health Organization (WHO) in 14 countries in four WHO regions showed that 8.7% of hospitalized patients had nosocomial infections (Modi & Kovacs, 2020). WHO data in 2016 stated that the incidence of nosocomial infections in Europe reached 4-4.5 million patients. In the United States, approximately 1.7 million patients experience nosocomial infections each year. The incidence of nosocomial infections in developing countries has doubled when compared to Europe. The prevalence rate of HAIs in Indonesia reaches 7.1%. Another study shows the incidence of infection in hospitals in Indonesia is around 3 – 21% (average 9%) (Ardiani & Hartono, 2022).

Research conducted on the inpatient wards of the Sukoharjo Regional General Hospital on 7830 patients showed that cases of nosocomial infection at the hospital, where 37 patients had nosocomial infections consisting of 23 cases of phlebitis, 8 cases of sepsis, 3 cases of pneumonia, and 3 cases of decubitus (Guanche-Sicilia et al., 2021). The types of nosocomial infections most often found in health care facilities, especially hospitals, are ventilator associated pneumonia (VAP), bloodstream infections (IAD), urinary tract infections (UTIs), and surgical site infections (IDO) (Emmanuel et al., 2020).

Infection prevention and control (PCU) is an effort made by hospitals to prevent, control, and evaluate the spread of infectious diseases that occur in health care facilities. Problems arising from nosocomial infections are a major challenge to hospitals, this is because they directly affect mortality and morbidity rates as well as increase in medical costs and patient care time. One of the goals to improve the quality of hospital services through the accreditation process is to reduce the risk of infection, so an Infection Prevention and Control Unit (PCU) was formed which has programs to control infectious diseases in health services (Ardiani & Hartono, 2022).

Factors that can affect the sustainability of the PCU program include the lack of knowledge and attitudes of staff, limited supporting facilities and infrastructure, inadequate availability of Personal Protective Equipment (PPE), unsustainable data collection on infection cases, and others. This condition can give a negative stigma to hospital health services and become an obstacle to the implementation of the PCU program. (Heriyati and Astuti, 2020) Important factors in implementing the PCU program can be carried out through the role of nurses who have direct contact and have an average time of exposure to patients around 7-8 hours per day, so that nurses have an important role in controlling nosocomial infections (Bag et al., 2021).

The Banda Aceh City Regional General Hospital is a type B hospital that has received five- star "Plenary" Accreditation from the Damar Husada Plenary Accreditation Institute (LARS DHP). As an effort to improve the quality of service, Meuraxa Hospital since 2015 has established and enacted a Hospital Infection Prevention and Control Manual as an example of implementing an infection prevention and control program in hospitals to minimize the risk of nosocomial infections (Sasangka et al., 2023).

Based on this description, researchers are interested in conducting research on the implementation of the PCU program in hospital inpatient rooms to find out the success of the PCU program and evaluate problems related to its implementation, and there has been no related research at Meuraxa Hospital as a referral center for the community, especially the City of Banda Aceh and the people of Aceh in general.

Method

This research is a quantitative analytic observational study with a cross-sectional approach that aims to implement an infection prevention and control program (PCU) in the inpatient room of the Meuraxa Regional General Hospital, Banda Aceh City. The data source came from the results of filling out a questionnaire conducted by the researcher for all nurses on duty in the inpatient room of the Meuraxa Regional General Hospital, Banda Aceh City. The data collected as a whole will be analyzed and the research results presented in table form with specific explanations and presented at the final stage of the research.

This study used a data collection tool in the form of a nurse characteristic questionnaire including: name, age, gender, nurse's last education, length of service, room, and whether or not she had attended PCU training. Another instrument is a questionnaire consisting of 5 assessment criteria consisting of an assessment of implementation of infection prevention and control (PCU) programs, nurse knowledge, nurse attitude, nursing facilities, as well as room supervision.

The research questionnaire was sourced from previous research conducted by Fakhrol Razi (2011) entitled "The Influence of Internal and External Factors of Nurses on the Prevention of Nosocomial Infections in the Surgical Inpatient Room at the Regional General Hospital (RSUD)". (Razi, 2011)

Result and Discussion

Notoatmodjo (2012) revealed that gender is one of the genetic factors that influence a person's behavior, along with environmental factors. Overall, these genetic

and environmental factors play a role in determining the behavior of living things, including human behavior. The nursing profession is in great demand by women because it is closer to issues of mother instinct. Judging from the history of its development, nursing has become synonymous with work done by women thanks to the struggles of figures such as Florence Nightingale (Sidiq et al., 2020).

The results of this study indicate that the majority of respondents in the study were female as many as 161 people (87.5%). The results of this study are in line with research conducted in the inpatient room of RSUD Haji Makassar which showed that the majority of nurses were female (93.2%). Research conducted on nurse at the Blud inpatient unit at Konawe Selatan Hospital also shows that most of the nurses are female as much as 51.2%. The results of research conducted on nurses at Imelda Hospital in Medan City also support this study by showing that the frequency distribution of nurses based on gender is dominated by female sex (90.3%) (Sadli et al., 2017). Similar research findings were also shown for nurses at Bima Hospital in 2018, where 76.7% of the nurses were female. The results of the correlation analysis of the sex of nurses with the implementation of the PCU program show that there is a significant relationship between the gender of nurses and implementation of the infection prevention and control program (PCU) in the inpatient room of the Meuraxa Regional General Hospital, Banda Aceh City (p -value = 0.033). Similar findings were also found in the research of Naim Setyobudi (2013) at Prof. Orthopedic Hospital. Dr. R. Soeroso Surakarta (Mabrurah & Hermawati, 2023). The majority of implementing nurses who prevent nosocomial infections are women (63%), while the majority of implementing nurses who do not prevent HAI are male (37%). According to Robbins in Widyastuti (2018), there are no consistent differences between men and women in terms of problem-solving skills, analytical skills, competitive drive, motivation, sociability, or learning abilities. This implies that in the context of nosocomial infection prevention (Lam et al., 2019).

According to various literatures, age, gender, work experience, and participation in training on infection prevention measures have been identified as factors that influence nurses' knowledge and practice related to nosocomial infections (Foga Sebrot et al., 2023). The researcher's analysis based on the findings of this study relates to an imbalance in the proportion of sex among inpatient nurses. There were only 23 male nurses and 161 female nurses out of a total of 184 inpatient nurses. The implementation of nursing actions for patients and the prevention of nosocomial infections are generally carried out by room nurses who are female, because the majority of implementing nurses in inpatient installations are women. Even though there are male

nurses in one room, contact with patients and communication with patients is more often done by female nurses (Fitriyah et al., 2018). The observation results showed that the implementation of nosocomial infection prevention when carrying out nursing actions by male nurses and female nurses did not show a significant difference. This is due to the fact that nurses carry out nursing actions based on their knowledge, so that gender is not the main factor influencing nursing actions to patients (Raofi et al., 2023).

Age has a significant effect on nursing actions. The older a nurse is, the more responsible and experienced they are in accepting work. This factor has a positive impact on the performance of nurses in nursing actions for patients (Siagian, 2010). This finding is in line with research conducted by Ismael (2009), who found that age is closely related to the level of maturity or maturity of nurses. With age, a person tends to experience an increase in maturity, and the psychological aspect shows signs of a more mature soul maturity (Mita et al., 2022).

The results showed that the majority of respondents in this study had an age range of 26- 35 years, namely 113 people (61.4%). Research conducted on nurse at the Blud inpatient unit at Konawe Selatan Hospital also shows that most of the nurses are in the age group of 31-35 years (Iqbal Ahmad et al., 2023). This finding is similar to the results of a study conducted on nurses in the internal care room of Bima Hospital, where the majority of nurses (43.3%) were in the 26-30 year age group, followed by 23.3% of respondents who were in the 31-35 age group. year. (Zulkarnain, 2018) Similar findings also show that the majority of nurses are in the age range of 20-30 years (66.7%) followed by age (29.4%) (Rafi, 2019).

The results of the correlation analysis of the age of the nurse and the implementation of the PCU program show that there is a significant relationship between the age of the nurse and the application of the infection prevention and control program (PCU) in the inpatient room of the Meuraxa Regional General Hospital, Banda Aceh City (p -value = 0.004). Similar findings were also conveyed in a study conducted at Dr. Hospital. Reksodiwiryo, the majority of nurses are in the young adult category (18 - 40 years). However, statistically, there is no significant relationship between age and nosocomial prevention. Even though young adults carry out many nursing actions, it was found that some of the nurses did not carry out nursing actions in accordance with the Standard Operating Procedures (SOP) that had been prepared. As many as 42% of young adult nurses also did not know how to place patients in the ward and ended up placing patients not according to the patient's diagnosis.

Previous researchers stated that the more a person reaches a sufficient age, the level of maturity and

strength will be more mature in thinking and working. When they reach the age of 28, it is expected that nurses will have reached a more mature level of maturity in thinking and also in the practice of preventing nosocomial infections, by adhering to nosocomial infection prevention standards. Research by Siagian (2010) also strengthens this by asserting that the older a person is, the more capable they are of showing mental maturity and being able to think rationally, wisely, control their emotions, and be open to the views of others. Age also affects the level of nurse compliance, as found in Puspasari's research (2015) (Bag et al., 2021). According to various literatures, age, gender, work experience, and participation in training on infection prevention measures have been identified as factors that influence nurses' knowledge and practice related to nosocomial infections (Foga Sebrot et al., 2023).

It is important for nurses to have adequate education and knowledge, especially in terms of preventing nosocomial infections. This is because education and knowledge greatly influence the actions of nurses in providing services to patients. Efforts to improve the education, knowledge and work experience of nurses can be done through health training, as well as training for other health workers. This step is clear evidence of efforts to prevent and control nosocomial infections in hospitals.

The results of this study indicate that the distribution of respondents based on education is dominated by D-III education, namely as many as 128 people (69.6%). This research is in line with research conducted in the inpatient room of RSUD Haji Makassar which showed that the highest level of education among nurses was D-III (91.9%). (Amrullah, 2016) The results of other studies that are in line with this research are research conducted on nurses at Imelda Hospital in Medan City showing that the majority of nurses' education is D-III in nursing (77.4%) (Boora et al., 2021). Research conducted by Faizin and Winarsih in Amrullah (2006) states that the level of education affects the performance of nurses, so that nurses have the ability to prevent the risk of nosocomial infections. This finding is supported by the fact that the majority of nurses have a Diploma in Nursing education (91.9%) which meets the standard criteria as professional nurses.

The researcher's analysis concluded that the length of work of employees is related to a person's experience, so the longer a nurse works, the more skilled a person is in carrying out nursing service actions related to the prevention of nosocomial infections. The longer a nurse works in an inpatient room, the more experience and knowledge she gains in her workplace. However, the observation results show that not all nurses who work for a period of more than 5 years or who are referred to as seniors, prevent nosocomial infections properly when

carrying out nursing actions. There are even those whose performance is worse than the junior nurses. This is because the length of work is not the main factor affecting the prevention of nosocomial infections (Assadian et al., 2021).

According to Simamora (2016), training (training) is a process that involves increasing the level of knowledge, concepts, rules, or attitudes of a person in order to improve the performance of workers. Andrew in Mangkunegara (2016), states that training is a learning process that focuses on increasing knowledge and skills in a relatively short time to increase the understanding and ability of non-managerial officers to overcome unmet boundaries. In accordance with Article I Paragraph 9 of Law No.13 of 2016, training on Prevention of Infectious Diseases (PCU) is an activity that aims to provide, improve and develop work skills in achieving productivity, discipline, treatment and work ethics in order to increase capacity and reliability according to the level of ability to become a leader or worker (Ardiani & Hartono, 2022).

The strategic training plan involves developing and improving performance, reducing absenteeism and rotation rates, and increasing worker satisfaction. In accordance with the Ministry of Health of the Republic of Indonesia (2017), three general indicators in Infection Disease Prevention (PCU) training are skills in carrying out instructions and outreach, implementing PCU tasks, and evaluating the results of the training process. (RI Ministry of Health, 2017) The Indonesian Ministry of Health has issued PCU Managerial Guidelines in Hospitals and Other Health Facilities which emphasize the importance of implementing infection prevention and control (PCU) to reduce the risk of infection in hospitals and other health care facilities. PCU activities include planning, implementation, coaching, education, training, as well as monitoring and evaluation. This expertise is crucial in ensuring the safety and quality of health services (Nababan et al., 2023).

The results of this study indicated that the majority of the study respondents, as many as 126 people (40.8%) had attended infection prevention and control (PCU) training. Similar results were also found in research conducted at 'Aisyiyah Hospital and Muhammadiyah Hospital which showed that the majority of nurses (87.7%) had PCU training experience (Fitriyah et al., 2018). The results of the correlation analysis of PCU training history with the implementation of the PCU program show that there is no significant relationship between PCU training history and application of the infection prevention and control program (PCU) in the inpatient room of the Meuraxa Regional General Hospital, Banda Aceh City (p-value = 0.260). This study showed that the participants did not obtain appropriate information and knowledge due to differences in

education levels, short history of infection prevention and control (PCU) training for new nurses, and lack of ongoing training for intern nurses. Research conducted at the Makassar City Hospital in 2013 also showed that there was no relationship ($p > 0.05$) between PCU training and the implementation of infection prevention by implementing nurses. Based on Bady in Hidayah (2018), training on infection prevention is closely related to the attitudes and skills needed by nurses in carrying out nosocomial infection prevention practices (Vidaković et al., 2020).

According to Notoadmodjo (2010), knowledge is the result of the process of knowing something after individuals sense certain objects. This sensing occurs through the five human senses, namely the senses of sight, hearing, smell, taste, and touch. (Amrullah, 2016) Understanding the basic concepts and knowledge of infectious diseases is a very important prerequisite for infection prevention and control in health care facilities. The preparation of infection prevention and control guidelines in health facilities has an impact on the achievement of quality health services. This guideline will serve as a guide for all parties involved in implementing infection prevention and control efforts in health facilities, so that the community can be protected and "patient safety" can be guaranteed.

The results showed that the majority of respondents in this study had good knowledge on the application of the infection prevention and control program (PCU) in the inpatient room of the Meuraxa Regional General Hospital, Banda Aceh City, namely as many as 161 people (87.5%). The results of this study are in line with research conducted on nurse at the Blud inpatient unit at Konawe Selatan Hospital shows that most of the respondents have good knowledge as many as 25 people (61.0%) (Purwaningsih et al., 2019). The findings from this study are in line with studies conducted by Zulkarnain (2018) and Suhasti (2021) which found that nurses working in inpatient rooms have good knowledge about nosocomial infections (Sasangka et al., 2023).

The results of the correlation analysis of nurses' knowledge with the implementation of the PCU program showed that there was no significant relationship between nurses' knowledge and application of the infection prevention and control program (PCU) in the inpatient room of the Meuraxa Regional General Hospital, Banda Aceh City (p -value = 0.306). The results of this study are in line with research conducted at Rafflesia Hospital Bengkulu based on the Chi Square test which found no significant relationship between nurses' knowledge of nosocomial infections and their preventive measures with a score p -values = 0.121 > 0.05 (Mabrurah & Hermawati, 2023). The findings from this study are in line with the results of previous research

conducted by Sukardjo (2011), where the results showed that there was no relationship between nurses' knowledge of nosocomial infections and their control measures. Similar findings were also found in a study by Rahmawati (2014), who found that there was no relationship between nurses' knowledge about preventing nosocomial infections and hand hygiene. The results of another study conducted by Prima (2016) also concluded that there is no relationship between knowledge and measures to control nosocomial infections (Modi & Kovacs, 2020).

Based on the findings of this study, the nurse's knowledge of nosocomial infections which was classified as good did not have a significant effect on infection prevention measures. This insignificant relationship may be influenced by the fact that not all nurses on duty at the hospital receive Infection Prevention and Control (PCU) training. Even so, the nosocomial infection prevention measures carried out by nurses remained at a good level. This may be due to the work experience of the majority of nurses who have worked ≥ 5 years. In addition, the hospital has guidelines for prevention of nosocomial infections that must be implemented by all individuals in the hospital.

Attitude is a person's closed response to a certain stimulus or object, which involves opinion factors and related emotions such as feelings of pleasure-disapproval, agree-disagree, good-not good, and so on. Campbell (1950) in Notoadmodjo (2010) provides a very simple definition, namely "A person's attitude is a collection of consistent responses to objects." Thus, attitude includes thoughts, feelings, attention, and other mental symptoms that respond to certain stimuli or objects (Boora et al., 2021).

This study shows that the majority of respondents as many as 156 people (84.8%) have an attitude positive impact on the implementation of the infection prevention and control program (PCU) in the inpatient room of the Meuraxa Regional General Hospital, Banda Aceh City. Findings similar to the results of the study were found in the results of a study on nurses at Kendal Islamic Hospital which showed the majority of nurses had a good attitude (51.7%) and good nosocomial infection prevention practices (59.8%). This happened because most nurses showed a positive and supportive attitude towards nosocomial infection prevention measures. The nurse's positive attitude can improve the nurse's behavior in carrying out universal precautions. Research results that are also in line with this study are the findings of Yulia (2009) which states that the majority of nurses show a positive attitude towards infection prevention (84.3%) (Assadian et al., 2021).

The results of the correlation analysis of nurses' attitudes with the implementation of the PCU program showed that there was no significant relationship

between nurses' attitudes and implementation of the infection prevention and control program (PCU) in the inpatient room of the Meuraxa Regional General Hospital, Banda Aceh City (p -value = 0.950) nurse compliance in implementing universal precautions at RSUD Pandan Arang Boyolali. Different results were found in a study conducted by Dantik, where there was a significant relationship between attitudes and practices in preventing nosocomial infections. This study also found that there was a significant relationship (Sig. value (p) of 0.034) between attitudes and behavior of nurse compliance in preventing surgical wound infections in the inpatient room of the Regional General Hospital dr. Moewardi Surakarta (Nababan et al., 2023).

The results of the researchers' observations during the study showed that there were several factors that led to poor behavior in nurses. One of them is because the facilities that support nursing services are inadequate, such as a sink but the water doesn't drain properly, the absence of hand dryers, the use of gauze as hand towels, and not all rooms have sterilizers. In addition to limited facilities, another factor that plays a role is the bad habits of nurses when interacting with patients or infectious objects/equipment, who often do not use personal protective equipment consistently. The percentage of nosocomial infection incidents as an aspect of assessing the quality of services in health facilities has increased due to the non-compliance of nurses in washing their hands after handling patients. The use of personal protective equipment such as gloves and masks, care of sterile patient equipment, environmental control, and prevention strategies are very important to reduce the incidence of nosocomial infections. Maintaining hand hygiene or performing hand hygiene is the main critical step that must be considered by medical staff, especially nurses. This is because about 80% of infections spread by hand (Vidaković et al., 2020).

Important infectious disease prevention behaviors (PCU) for health workers include using personal protective equipment (PPE) according to standard procedures, and applying antiseptics, carrying out disinfection when examining patients, washing hands properly after interacting with patients or carrying out medical procedures. . The implementation of this PCU aims to prevent the transmission of microorganisms from health workers to patients, so that patients are not exposed to the risk of infection. On the other hand, PCU also plays a role in protecting medical staff from the potential transmission of microorganisms from patients, and also reduces the risk of transmission among medical workers around the patient's environment. (Heriyati and Astuti, 2020) Based on the results of the study, it was found that nursing facilities were to support the implementation of the infection prevention and control program (PCU) in the inpatient room of the Meuraxa

Regional General Hospital, Banda Aceh City, was in the good category (86.4%). This research is in line with the research conducted in a regional hospital in Central Java, which showed the availability of facilities to support nosocomial infection prevention measures, almost all (97.5%) were in the good category (Mita et al., 2022).

The results of the correlation analysis of nursing facilities with the implementation of the PCU program show that there is no significant relationship between nursing facilities and application of the infection prevention and control program (PCU) in the inpatient room of the Meuraxa Regional General Hospital, Banda Aceh City (p -value = 0.156). The results of a similar study also showed consistent findings ($p=0.07$), namely that there was no significant relationship between the availability of facilities and the behavior of nurses in performing hand hygiene at the Telaga Health Center.

Research data obtained by room supervision to support the implementation of the infection prevention and control program (PCU) in the inpatient room of the Meuraxa Regional General Hospital, Banda Aceh City, was in the good category (87.0%). The results of the research which are in line with this study also show that the implementation of the PCU Team's role in the form of supervision has gone well. Almost all roles get success rate above 90%. The role in implementation, especially related to conveying objectives in supervising (89%) and also the role of monitoring in evaluation related to providing feedback related to audit reports (91%) (Iqbal Ahmad et al., 2023).

The results of the correlation analysis of room supervision with the implementation of the PCU program show that there is no significant relationship between room supervision and application of the infection prevention and control program (PCU) in the inpatient room of the Meuraxa Regional General Hospital, Banda Aceh City (p -value = 0.747) The results of this study are in line with research conducted by Nurrahmani et al. (2019) which stated that there was no significant relationship between the role of the PCU Team and the compliance of nurses' hand washing before and after carrying out nursing actions as an effort to prevent nosocomial infections ($p=0.085$) (Sax et al., 2020).

Conclusion

Based on the results of research that has been conducted on nurses in the inpatient room of the Meuraxa Regional General Hospital in Banda Aceh City during July 2023, it can be concluded that: There is a correlation between the age and gender characteristics of nurses and the implementation of the infection prevention and control program (PCU) in the inpatient

room of the Meuraxa Regional General Hospital, Banda Aceh City. There is no correlation between the knowledge, attitude, room facilities of nurses and the implementation of the infection prevention and control program (PCU) in the inpatient room of the Meuraxa Regional General Hospital, Banda Aceh City.

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Author Contribution

All authors had significant contributions to the completion of this manuscript

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Conflicts of Interest

The author's interest in the last 3 years has been in the public health. Because in today's era public health is very important to improve, especially in the field of hospital services, where the quality of service is expected to get maximum results, for the realization of better public health.

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