Evaluation of maintenance system in emergency installation of Meuraxa Hospital Banda Aceh, Indonesia

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Abstract. Hospital building and all its equipment require regular maintenance in order to avoid heavier damage. The implementation of continuity of optimal hospital building maintenance is expected to reduce the incidence of heavier damage and minimize the cost of existing repair and ensure the readiness of supporting facilities for the implementation of health services to the public in the hospital. The purpose of this research is to know the maintenance system that has been applied and to identify the condition of building emergency installation in Meuraxa Hospital. This research was conducted by distributing questionnaires to 91 respondents who are employees, nurses, doctors, and families of patients who are in the installation of Meuraxa hospital in Banda Aceh. Based on descriptive analysis, obtained the highest mean value is at component of roof maintenance at Building emergency installation (X1) for 3,934. This shows that respondents assess the roof maintenance variable is good. And the lowest mean is on ceramic maintenance component (X2) for 2,894. This indicates that respondents assess ceramic maintenance are less well. The observation results show the same thing with the opinion of the respondents which is the roof conditions on emergency installation Meuraxa is categorized as mild damage and still functioning well but the color of the roof cover has faded. Similarly, in the paint maintenance (X3), window and door frames maintenance (X4), ceiling maintenance (X5), water installation maintenance (X6), electrical installation maintenance (X7), air conditioning installation maintenance (X8), sanitary maintenance (X9) ) is categorized as mild damage but still function well. On the results of these observations by researchers in general about the building emergency installation, it can be concluded that the implementation of building emergency installation maintenance has been done well.

1. Introduction

The building is a construction that plays an important role in all aspects. After the building is completed then the building will be used and maintained. Maintenance (maintenance) will make the age of the building becomes longer, several types of Maintenance Management Terms in Terotechnology is planned maintenance, preventive maintenance, corrective maintenance [2].

The age of the building plan is the time frame of the building used to the building is severely damaged. To avoid heavy damage is required routine maintenance system [8]. Hospital building and all its equipment require regular maintenance in order to avoid heavier damage. The occurrence of damage to hospital buildings and completeness can disrupt health services to the community.
The building of the hospital and all its equipment require regular maintenance in order to avoid heavier damage. The occurrence of damage to hospital buildings and completeness can disrupt health services to the community [7].

Meuraxa Hospital is a public building whose maintenance and maintenance activities should refer to the requirements of maintenance and maintenance of the reliability of the state-building [7]. The terms of maintenance and maintenance include safety, health, comfort, and ease of building. The purpose of this research is to know the maintenance system that has been applied and to identify the condition of building IGD Meuraxa Hospital. Maintenance components reviewed include architecture such as roofing, floor coverings, ceiling coverings and utilities such as air conditioning and sanitation installations.

2. Building Construction Maintenance Components
The components of building maintenance [3]:
1) Architectural building. Architectural buildings, including floors and stairs, walls and partitions, doors and windows, roofs and gutters, and ceilings.
2) Utilities. Building utilities include electricity, plumbing, air conditioning (AC), indoor communications, fire and elevator, wastewater treatment plants.
3) Structure. Building structures include columns, beams, and walls of buildings.

2.1. Classification of Damage Type for Building
The classification type of damage for each observation of building components are grouped into 3 conditions that are lightly damaged, moderately damaged, and heavily damaged. Limits on the three types of damage are defined as follows [3]:

1) Structure Damage Category:
   - minor damage is damage to structural components that do not reduce the function of the service (strength, stiffness, and ductility) of the overall structure, ie small cracks in beams, columns, and walls having a gap width between 0.075 to 0.6 cm;
   - moderate damage is damage to structural components that can reduce strength but overall service capacity is in safe condition, ie large cracks in beams, columns, and walls with a gap width greater than 0.6 cm;
   - Heavily damaged is the damage to structural components that can reduce its strength so that the service capacity of the part or all of the structure is insecure, ie when the load-bearing wall is split and collapsed, the building is separated by the failure of the binder element and 50% of the main element is damaged or unfit for habitation.

2) Categories of Architectural Damage:
   - minor damage is damage that does not disturb the function of the building in terms of architecture, such as damage to the finishing work, namely peeling paint that does not cause disruption of function and aesthetics and does not pose a hazard at all, to residents;
   - medium damage is damage that can disrupt the function of the building in terms of architecture (function, comfort, aesthetics), such as damage to the building that is broken glass on windows and doors that can reduce the aesthetics of buildings and reduce comfort to residents; and
   - severe damage is very detrimental damage to the function and aesthetics of the building and result in the loss of comfort and can cause harm to the inhabitants.

3) Categories of Utility Damage:
   - minor damage is minor damage or malfunction of the utility sub-component that will not cause interference or diminish the function of utility components, for example on electrical installations, ie the extinguished one of the lights in the room;
   - moderate damage is the malfunctioning or non-functioning sub-component of the utility that causes interference or diminishes the functionality of the utility component, for example on
the installation of a disturbed telephone in one of the rooms causing the death of the telephone line; and

- heavily damaged is the malfunctioning or malfunctioning sub-component of the utility that may cause severe disruption or result in total utility malfunctioning.

3. Data Collection

The object of the study is indicators that support the implementation of the maintenance system at the installation of Meuraxa hospital in Banda Aceh. The subjects of this study are the staff, nurses, doctors, and patient families who are in the installation of Meuraxa hospital in Banda Aceh.

The required data in this study are primary and secondary data. The samples were taken approximately 10% of the total population [1]. The total population is 914, and this study has 91 respondents. In this study have independent variables (X) and variable dependent (Y). There are 9 independent variables, roof maintenance (X1), ceramic maintenance (X2), paint maintenance (X3), window and door frames maintenance (X4), ceiling maintenance (X5), water installation maintenance (X6), electrical installation maintenance (X7), air conditioning installation maintenance (X8), sanitary maintenance (X9), and variable dependent is maintenance system (Y).

4. Result and Discussion

4.1. Respondent Characteristic

Based on a questionnaire distributed to 91 respondents. Characteristics of respondents in this study are gender, age, occupation and frequency of visits to Meuraxa Hospital within a month. Male respondents were 33 people (33.86%) and female respondents (58.64%). The characteristic of the age shows respondents who have age < 17 years as many as 13 (14%), age 17 - 26 years as many as 76 people (84%), and respondents aged 27-35 Years as many as 2 people (2%).

Based on the work, the respondents who work as an employee amounted to 28 people (31%), doctors are 11 people (12%), nurses are 40 people (44%), and families of patients are 12 people (13%). The characteristic of the frequency of visitors who visited the hospital 1 to 3 times a month were 15 people (16%), and who visited the hospital more than 7 times a month were 76 people (84%).

4.2. Building Maintenance

Based on the respondent's answer, we get the mean value for each variable. The distribution of mean values for each variable can be seen in Table 1.

| Number | Variable                                | Mean   | Rating |
|--------|-----------------------------------------|--------|--------|
| X1     | roof maintenance                        | 3,934  | 1      |
| X2     | ceramic maintenance                     | 2,894  | 9      |
| X3     | paint maintenance                       | 3,868  | 7      |
| X4     | window and door frames maintenance      | 3,901  | 4      |
| X5     | ceiling maintenance                     | 3,853  | 8      |
| X6     | water installation maintenance          | 3,885  | 6      |
| X7     | electrical installation maintenance     | 3,886  | 5      |
| X8     | air conditioning installation maintenance| 3,926  | 2      |
| X9     | sanitary maintenance                    | 3,908  | 3      |

Based on descriptive analysis, obtained mean roof maintenance (X1) of 3.934. This shows that respondents rate good for roof maintenance variables. Furthermore, in the ceramic maintenance (X2) obtained value of 2.894 it shows that ceramic maintenance (X2) has good enough value based on
respondent's opinion. In paint maintenance variables (X3) got a mean value of 3.868 respondents assessed the maintenance of paint goes well.

Furthermore, window and door frames maintenance (X4) got a mean of 3.901. means maintenance of window and door frames running well, then on the ceiling maintenance variable (X5), got a mean value of 3.853, maintenance of water installation (X6) got a mean value of 3.885, maintenance of electrical installation (X7) got a mean value of 3.886, maintenance of air conditioning (X8) gets a mean of 3.926, and sanitation maintenance (X9) got a mean value of 3.908. So it can be concluded the dominance of respondents argues that the variables X6, X7, X8, and X9 running well. Among other variables, the X1 variable that is roof maintenance in Building IGD (X1) has the highest mean value. And for the lowest is in the variable X2 is 2.894 has a mean value lower than other variables and in general this variable is running well.

4.3. Condition of emergency installation building Meuraxa Hospital

From the observation about the condition of damage to the IGD Meuraxa Hospital building on the components of the Architecture include Roof, Ceiling, walls, ceramics, and paint. While the utility components include AC, Piping, and Lift. Condition of the roof looks good only the color of the roof that has faded and does not disturb the function of the roof so categorized minor damage. On the ceiling, both the first floor and the second-floor type of damage that is the existence of holes and mossy so that damage to the ceiling is categorized minor damage.

On the wall seen that the existence of damage in the form of small cracks and can be categorized minor damage due to damage that does not disrupt the function of the wall and does not pose a hazard to the user at all. In ceramics seen the number of ceramics is broken and categorized as heavy damage because it has disrupted the function and aesthetics of the building and resulted in the loss of comfort and can cause harm to the user of the building.

In the paint looks damaged to the peeling paint, this can be categorized as minor damage because it is a disruption of function and aesthetics and does not pose a hazard to the user of the building. On the elevator seen damage to one of the available lifts are dead and can not be used, this can be categorized as moderate damage due to malfunction of one of the elevators causing interference or reduce the function of the existing elevator in the room. In air conditioner damage in the form of a loud sound, this can be categorized as moderate damage because it can cause interference to the user room. In the installation of Meuraxa hospital two lights are not lit; this can be categorized as moderate damage due to the non-functioning of some lights that can reduce the lighting in the room.

5. Conclusion

Based on the results of 91 respondents who responded to questionnaires distributed, the highest mean value is at component of roof maintenance at Building IGD (X1) for 3.934. This shows that respondents assess the roof maintenance variable is good. And the lowest mean is on ceramic maintenance component (X2) for 2.894. This indicates that respondents who assess ceramic maintenance are less well.

On the results of these observations by researchers in general about the building emergency installation, it can be concluded that the implementation of building emergency installation maintenance has been done well.

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