

ORIGINAL ARTICLE

DESIGNING ELDERLY-FRIENDLY PUSKESMAS FACILITIES USING AGE-FRIENDLY PRINCIPLES (CASE STUDY PUSKESMAS X)

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ABSTRACT

According to the 2019 World Population Prospects, globally, the proportion of older people is projected to increase to 16% by 2050 so that by 2050, 1 in 6 people in the world will be over 65 years old. WHO recognizes the important role of primary healthcare centers to be accessible and adapted to the needs of the elderly population. Puskesmas X is one of the health centers in Karanganyar, Central Java. This health center has encouraged efforts to improve health services for the elderly by creating a special clinic for the elderly. However, several aspects of elderly-friendly health services still have not been fulfilled. This study was conducted to identify and evaluate the suitability of health center design in terms of age-friendly principles and regulations related to the provision of elderly health services at health centers and provide recommendations for improving the design of health center facilities by taking into account the human side (ergonomics). The evaluation of elderly-friendly principles in health centers was carried out based on a checklist developed from the WHO toolkit and Indonesian laws and regulations. Based on the checklist that was developed, Puskesmas X received a score of 70% or in the yellow achievement category as a health center that fulfills the principle of being friendly to the elderly. Proposed improvements to the facilities provided for Health Centre X are improvements for the elderly services procedures, parking lots, corridors, signage, waiting chairs, elderly polyclinics waiting room layouts, elderly medical bed, pharmacy counter, pharmacy counter waiting room layouts, and toilets.

Keywords: Age-Friendly, Elderly, Ergonomics.

INTRODUCTION

Elderly are defined by the United Nations as people over age 60¹. Elderly are the fastest-growing population group in the world². Globally, elderly population will increase to 16% in 2050 so 1 of 6 people will be over 65 years old³. In Indonesia, proportion of elderly is 29.3 million people or 10.82% of the population. There are eight provinces with old population structure (the proportion of elderly population is greater than 10%), one of which is Central Java (14.17%)⁴.

Aging is associated with increased vulnerability and dependence on medical care services as the elderly are physiologically fragile and get sick more easily^{5,6}. It is reported that morbidity rate of Central Java in 2021 was 24.04%⁷. This shows that demand for health services for elderly is greater than for rest of population⁸. Local authorities must prioritize higher policy implementation for elderly population⁹.

WHO recognizes important role of primary health centers in elderly health and need for these centers to be accessible and adapted to elderly population¹⁰. Primary health care is very important in improving public health¹¹. Age-Friendly Principles are designed to serve as guide

for changing clinical management and services, staff training, and environment to better suit needs of elderly¹².

Indonesian government has encouraged increase quality of elderly health services by issuing Minister of Health Regulation Number 67 of 2015 concerning Implementation of Elderly Health Services at Community Health Centre (Indonesian: Puskesmas). Puskesmas is a health service facilities that carry out public and first-level individual health efforts, by prioritizing promotive and preventive efforts, to achieve the highest level of public health in their working areas¹³. Puskesmas acts as frontline unit because of its role as first-level community health service center¹⁴. Evaluation of services for elderly health care, especially at Puskesmas, is important to find out how far existing guideline have been implemented¹⁵. Addressing barriers access to primary care can reduce risk of ill health¹⁶.

Karanganyar is one of districts in Central Java Province. Population of Karanganyar in 2021 is 938.808 people with proportion of elderly of 131.015 people¹⁷. Puskesmas X is one of health centers in Karanganyar. This health center has encouraged efforts to improve health services for

elderly by creating a special polyclinic for the elderly. However, during the observation, there were still several aspects of elderly-friendly that had not been fulfilled.

Based on preliminary survey, it was found several things that were not in accordance with requirements of elderly-friendly, including: no special parking space for elderly, design of furniture that uncomfortable, toilets that were not up to standard, and no queue priority system for elderly.

Related research has been conducted to investigate how far hospitals in Tehran fulfilled criteria of elderly-friendly hospitals. Data collection instrument was checklist consist of 50 items. Checklist was developed from elderly-friendly toolkit published by WHO and Rashmi's checklist translated by two translators and localized by health expert¹⁹.

Based on that, this research aims to (1) identify and evaluate suitability of the puskesmas design of the age-friendly concept and regulations related to the implementation of elderly health services at puskesmas, and (2) provide recommendations for improving design of puskesmas' facilities based on the human side (ergonomics). Research instrument is a checklist consist of 71 items developed from the WHO Age Friendly Toolkit¹⁰, Rashmi's Checklist¹⁸, and adjusted to the laws and regulations in Indonesia.

METHODS

This research begins with literature study, field observations, and problem identification. Field observations were done to overview the condition of the buildings and facilities, flow of services for the elderly, and layout of Puskesmas X. Based on literature studies and field observations, further research is needed regarding the feasibility of being elderly-friendly at Puskesmas X. An assessment is needed to find out whether the design of the puskesmas facilities fulfilled the criteria to support the health of elderly. Followed by providing recommendations for improvements refer to the principles of ergonomics.

The next step is preparation of checklist. Checklist is used as assessment tool for Puskesmas X on the principle of being friendly to the elderly. Checklist was developed from the Age Friendly Primary Health Center Toolkit by WHO¹⁰, Checklist to Assess Senior Friendliness of Hospital by Rashmi¹⁸, and adapted to regulations in Indonesia which contain criteria for buildings and infrastructure in elderly health services in Regulation of the Minister of Health of Republic of

Indonesia Number 67 of 2015¹³, and the requirements for building components and materials for puskesmas contained in Regulation of Minister of Health of Republic of Indonesia Number 43 of 2019²⁰. The WHO checklist is based on direct observations in primary health care centers and focus group discussions involving older people and health care providers. Meanwhile, the checklist developed by Rashmi et al. is based on interviews with many stakeholders involved in elderly care and also a modification of the Delphi technique involving experts among the same stakeholders.

Next step is data collection. Data was taken through two times direct observation and interviews. Several questions on the checklist were asked directly to the head of Puskesmas to get more valid answers.

Data collected includes layout of puskesmas, flow of services, and assessment of the puskesmas. The flow of puskesmas services is needed to determine puskesmas service system for elderly. The puskesmas assessment was done referring to the elderly-friendly puskesmas assessment checklist and done by direct observation and interviews with related parties.

The research was continued with data processing of assessing suitability. Assessment is done by giving value of 1 for appropriate criteria and value of 0 for inappropriate criteria²¹. Classification is done by converting the suitability value into percentage form.

$$\text{Conformity percentage} = \frac{\text{Suitability value}}{\text{Maximum value}} \times 100\% \quad (1)$$

Achievement per 25th percentile is categorized as follows:

- Conformity percentage < 25% means the achievement category is red.
- Conformity percentage of 25 - 49% means the achievement category is orange.
- Conformity percentage of 50 - 74% means the achievement category is yellow.
- Conformity percentage of 75 - 100% means the achievement category is green²².

Next step is design of proposed improvements based on results of assessment. Results of this checklist will be discussed with head of Puskesmas X to determine priority improvements to be made.

RESULTS

Puskesmas Assessment

Assessment checklist is filled in to find out the current condition of Puskesmas X. Recap of the assessment results can be seen in Table 1.

Table 1: Recap of the Assessment Checklist

Criteria	Item	Yes	No	Note
A. Accessibility	Health centre served by public transportation	✓		
	Closer station less than 50 meters from centre entrance		✓	Distance: 60 m
B. Entrance				
1. Before main entrance	Are there steps?	-	-	
	Steps have railings	-	-	One/Both Side
	Is there a ramp?	✓		
	Ramp has railings	✓		
	Ramp has a gentle slope (1:10/12/14/16)	✓		
	Ramp has a minimum width of 120 cm	✓		Width: 340 cm
2. Entrance	Ramp is not slippery	✓		
	Width of entrance greater than or equal to 90 cm	✓		Width: 120 cm
	Type of door swing/sliding	✓		Swing
	Entrance accessible to wheelchair-users	✓		
	Entrance landing area free of obstacles	✓		
	Emergency exits identifiable and accessible	✓		
C. Parking	There is special parking for disabled/older person near main entrance		✓	
	Size of parking lot (min: 480 cm x 360 cm)	✓		Dimension: - Motorcycle parking: 320 m ² - Car parking: 436 m ²
D. Lift - in case has more than one floor	Lift accessible to every floor	-	-	
	There is accessible path to lift	-	-	
	Lift door easy to identify	-	-	
	Clear door opening width more than 90 cm	-	-	Width: -
E. Public Telephone	There is public telephone near the entrance or waiting hall	-	-	
F. Floor Plans	Reception counter near entrance and identifiable	✓		
	Rooms organized in logical manner so the user will be less stressed	✓		
	All doors width greater than or equal to 90 cm	✓		
	Sitting arrangements comfortable enough		✓	Design of seats and pharmacy counters is uncomfortable
	Floor non-slippery and well maintained	✓		
	Furniture and fittings well organized to reduce possible falls		✓	Medicine bed is high enough and require footrest
	Spare wheelchairs are available	✓		
	Rooms and corridors have sufficient light and ventilation	✓		
	Waiting room for elderly patients located near the polyclinic	✓		
	Waiting room is equipped with special seats that are comfortable and safe for elderly		✓	Waiting chair uses 3 seat metal frame and silver coating seat
	Consultation of elderly is carried out in special room	✓		

Criteria	Item	Yes	No	Note	
G. Toilets	Toilets near waiting hall	✓			
	Entrance to public toilet accessible to wheelchair		✓		
	Doors width greater than or equal to 90 cm		✓	Width: 75 cm	
	There is at least one accessible shower	✓			
	There are grab bars around the toilet	✓			
	All fittings are easy to use	✓			
	There is alarm system in case of emergency		✓		
	Using sitting WC	✓			
	Toilet floor has no puddles and not slippery		✓		
H. Eating Place	Toilets are separated for women and men		✓		
	There is eating outlet within the building	✓			
	Eating outlet generally accessible	✓			
I. Staircase - in case has more than one floor	Water tap and basin easily accessible	✓			
	Steps friendly to elderly -uniform and clearly identifiable	-	-		
	There are handrails or grab bars	-	-		
	Handrails or grab bars continuous	-	-	Height: -	
J. Corridors	Height of handrails between 80 - 90 cm from the floor	-	-	Height: -	
	Corridors have minimum unobstructed width for wheelchair	✓		Width: 210 cm	
	Corridor pathway obstruction-free	✓			
K. Signage	There are handrails or grab bars		✓		
1. Designing Signage	Characters and backgrounds of signs are matte	✓			
	Characters and symbols contrast with background	✓			
	Visual display is simple and easy to understand	✓			
	Common and familiar pictures are used	✓			
	Color are used to emphasize key points	✓			
	Tone of sign messages is welcoming and cordial	✓			
	2. Placement of Signage	All signs are placed at eye level	✓		
		There is signage at main traffic to indicate location		✓	Some room locations are not shown on signage
		Consistent room numbering system	✓		
	3. Identifying Personnel	Emergency exits are clearly marked	✓		
Staff are easily identifiable using name badges and name boards		✓			
There is name board that includes all staff with job title on duty		✓			
L. Medical Services	There is system of priority in pharmacy to collect drugs		✓		
	Volunteers are available to guide elderly		✓		
	There is priority system in all service sections		✓		
	Elderly are explained about drugs at pharmacy	✓			
	There is separate queue at all counters		✓		
	In general, the staff are kind, respectful and patient	✓			
	There is home health service where staff visit homes of elderly if required	✓			
	There is system of giving appointments and reminders		✓		
	The doctors/nurses/staff are trained in basics of geriatric medicine	✓			
	Registration of elderly is separate from the general public/prioritized by given special place and label		✓		

Data Processing

Checklist consists of 72 items. There were 11 items (steps before main entrance, lift, and stair case) that were not included in the calculation because they were not available at Puskesmas X which only has one floor, so the maximum value is 61. There were 43 suitable criteria and 18 inappropriate criteria. Percentages are assessed as follows.

$$\text{Conformity percentage} = \frac{\text{Suitability Value}}{\text{Maximum Value}} \times 100\%$$

$$\text{Conformity percentage} = \frac{43}{61} \times 100\% = 70\%$$

Puskesmas X gets a score of 70% and achieving yellow color as an elderly-friendly health center.

Improvements are proposed for non-compliant facilities. Results of discussion with head of Puskesmas X regarding which criteria will be corrected are as follows:

Proposed Improvements for Elderly Services Procedures

Elderly services procedures is proposed to improve criteria for medical services that have

not been fulfilled, those are no priority system for taking medicine and registration, no officers to guide the elderly, and no system for making appointments and reminders. New procedure proposed is identification of elderly patients by officers. Special identification is given to elderly with high level of dependency and not accompanied by their families. Elderly with special identification will be accompanied by a caregiver starting from registration until taking medicine. In addition, at registration and pharmacy counters, the system will prioritize queues for elderly patients with special identification so they don't have to wait too long for service.

Proposed Improvements for Corridors

Puskesmas corridors have not been equipped with handrails. Handrails are needed as propagation medium for patients to reduce risk of slipping. Recommended handrail is handrail with aluminum frame and PVC cover so the surface is not slippery. Handrail is placed at height of 75 cm in accordance with guidelines in Indonesia which recommend handrail height between 65 - 80 cm²³. Comparison between the current corridor and the proposed corridor is shown in Figure 1

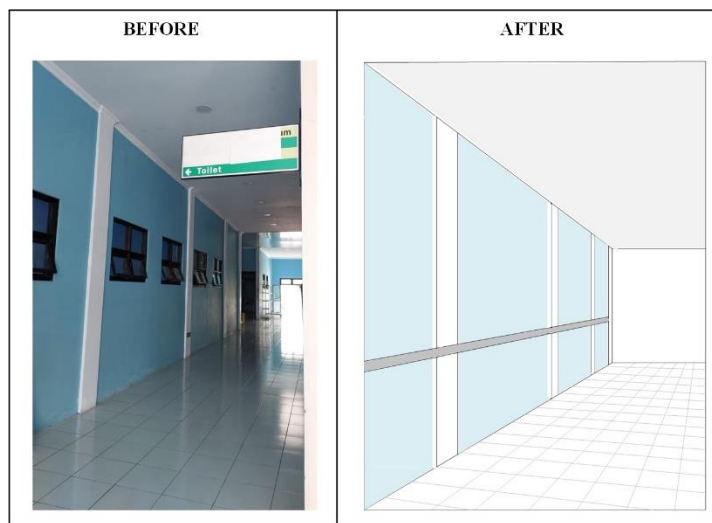


Figure 1: Comparison of Corridors

Proposed Improvements for Parking

Improvement for parking is proposed to improve item that has not been fulfilled, that is no special parking space for elderly. Parking for elderly and disabilities is proposed to be placed near the entrance. So, users with special needs don't have to walk too far. Parking areas with special needs are given special colors and signs to make it easier to recognize.

Proposed Improvements for Signage

Signage at Puskesmas X is incomplete. There are no directions to elderly polyclinics. Directions are needed to make it easier for patients. Proposed signage is in size 80 x 90 cm with 8 cm letters height which can be seen easily up to visibility of 9-12 m¹⁰. Comparison between current signage and proposed signage is shown in Figure 2.

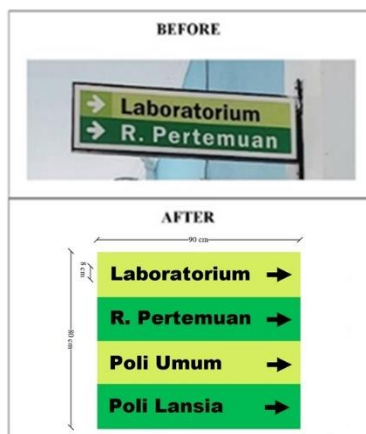


Figure 2: Comparison of Signage

Proposed Improvements for Waiting Chair

Waiting chairs are proposed to fix items that have not been fulfilled, which is no special seat for the elderly. Proposed chair is specifically designed using elderly anthropometry²⁴. Distance between floor and seat on current chair is 35 cm, while distance on the proposed chair is 48 cm. This size is based on the 95th percentile of popliteal height dimensions. With higher chair, elderly can sit more safely. Length and width of chair are also adjusted, backrest measures 47 x 47 cm, and seat cushion measures 46 x 44 cm. Width of backrest is

designed based on 95th percentile of shoulder width and height of the backrest is designed based on the 50th percentile of sitting shoulder height. Seat width was designed based on the 95th percentile of hip width and seat length was designed based on the 50th percentile of popliteal length. Also there is additional foam on the chairs so it can increase comfort of elderly when sitting. Waiting chairs are equipped with a label indicating that the chair is a special chair for the elderly.

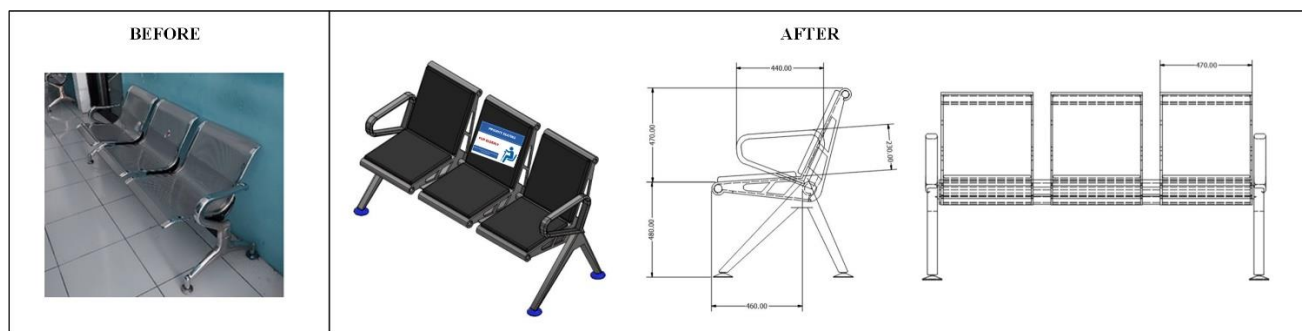


Figure 3: Comparison of Chair

Proposed Improvements for Waiting Room Layout of Elderly Polyclinic

There is no special waiting room for elderly. The proposed special waiting room for elderly patients is indicated by special waiting chairs that have been proposed previously. In addition, it is necessary to add waiting area for wheelchairs of 90 x 120 cm. This size adjusts size of wheelchair, which generally measures 70 x 105 cm.

Proposed Improvements for Medical Bed

Elderly medical bed is proposed to improve furniture and equipment items that have not been properly arranged. Current medical bed has 80 cm height so it still requires footrest. Proposed improvement refers to previous research, which proposed medical bed is equipped with adjustable system feature with hydraulic pump as driving component. This medical bed height can be

adjusted (minimum 47 cm, maximum 88 cm), referring to anthropometric dimensions of the elderly. With this feature, elderly do not need to use footrest, thereby reducing risk of slipping. Medical bed is also equipped with adjustable back section which assists health workers in helping patients get up from a lying position²⁵.

Proposed Improvements for Pharmacy Counter

Pharmacy counter are proposed to improve seating arrangements that are not yet comfortable for users. Current counter design with a seat height of 35 cm, counter height of 60 cm, and distance between seat and counter of 45 cm, causes patients take drugs in unnatural body position, bending. Proposed pharmacy counter has height of 95 - 205 cm. This size is made according to average eye height of Indonesian adults, which is 156,12 cm²⁶. With the proposed

counter, the patient takes drug in standing position so patient's posture is reasonable.

Comparison between current counter and proposed counter is shown in Figure 4.

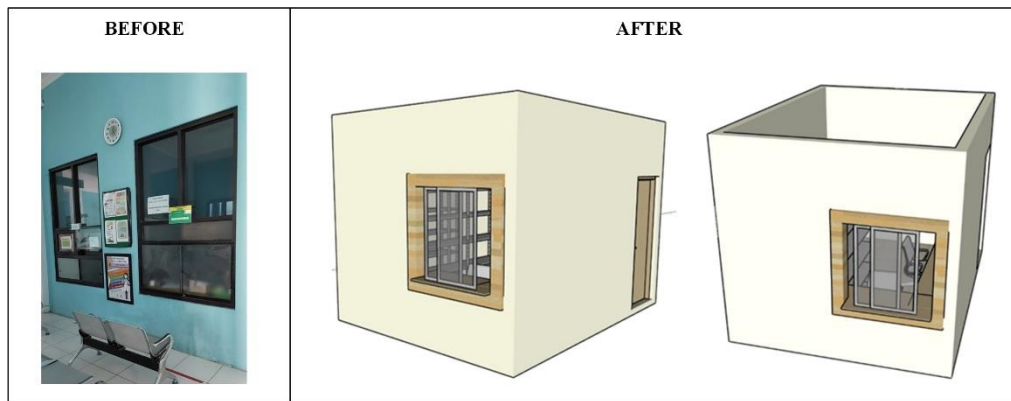


Figure 4: Comparison of Counter

Proposed Improvements for Pharmacy Counter Waiting Room Layouts

Waiting room needs to be added special waiting area for elderly with special waiting chairs. So elderly will get priority seat and they can wait in line for medicine comfortably. In addition, a 90 x 120 cm waiting area for wheelchairs is added.

Proposed Improvements for Toilet

Repair of toilet is proposed to improve several items, those are difficult entrance for wheelchair users to access, door width less than 90 cm, no alarm system for emergencies, and no separate bathroom label between men and women. There are some differences between current toilet and

proposed toilet design. Door which was originally 75 cm width with an opening to the outside, is proposed to be 90 cm width sliding door to make it easier for elderly and wheelchair users to enter toilet. Front door is marked with men's and women's toilet. There are additional handrails on right and left sides WC which are important for elderly and disabled do not easily slip, and make it easier for users to stand up from the toilet. There is also addition of panic button on the wall as an alarm that can be accessed in case of emergency. When the panic button is pressed, officers will come to help elderly. Comparison between current toilet and proposed toilet is shown in Figure 5.

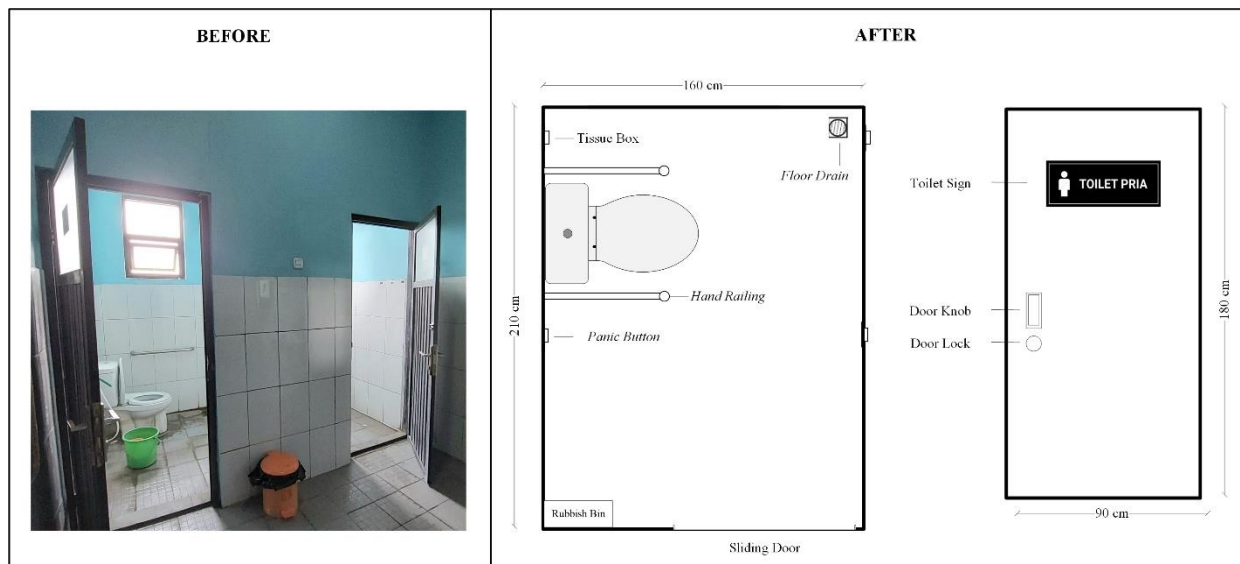


Figure 5: Comparison of Toilet

DISCUSSION

Based on filling in the checklist through observation and interviews, there were 40 items that were met and 18 items that were not met so that Puskesmas X got a score of 70% or in the yellow category as an elderly-friendly health

center.

Items that are not suitable are public transportation stops more than 50 m from the entrance, there is no special parking space for the elderly, seating arrangements are not yet comfortable for users, equipment has not been

arranged to reduce the possibility of falls, there is no special seating for the elderly, doors the toilet cannot be accessed by wheelchair users, the width of the toilet door is less than 90 cm, there is no emergency alarm in the toilet, the toilet floor is slippery, the bathroom is not separated between women and men, there are no handrails in the corridor, there are inappropriate room locations. shown on the signage, there is no priority system for the elderly, no caregiver, no appointment and reminder system, and no separate registration for the elderly.

To increase comfort of elderly while at the puskesmas, several improvements are proposed based on items that have not been fulfilled. The proposed improvements to the facilities provided to Puskesmas are improvements to the SOP for elderly services, parking lots, health center corridors, signage, waiting chairs, layout of the waiting room for elderly examination clinics, elderly examination beds, counters for taking medicines, layout of waiting rooms for taking medicines, and toilets.

This research develops an assessment checklist for elderly-friendly health centers in Indonesia, which has not had any previous research on this matter. Checklist was developed from WHO Age Friendly Toolkit¹⁰, Rashmi's Checklist¹⁸, and adapted to the laws and regulations in Indonesia. An evaluation of public facilities in Indonesia that refers to age-friendly principle was only assessment of a city park in Surabaya²⁷. It is expected that this research will contribute to development of research on elderly-friendly health services in Indonesia.

CONCLUSION

Puskesmas X received 70% as elderly-friendly puskesmas. Proposed improvements to the facilities provided for Puskesmas X are improvements to elderly services procedures, parking, corridors, signage, waiting chairs, elderly polyclinics waiting room layouts, elderly medical bed, pharmacy counter, pharmacy counter waiting room layouts, and toilets.

Suggestions for development is further research can be carried out up to the implementation stage so that effectiveness of proposed improvements can be assessed.

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