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ANTHROPOMETRICS AND ERGONOMICS OF THE FEMALE ELDERLY ABLUTION AREA

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Abstract:

In a mosque, the ablution area is one of the main facilities associated with the users in relation to their physical characteristics and actions. Most of the mosques in Malaysia are still lacking in consideration towards female elderly users in terms of their capabilities and abilities that relate to anthropometrics and ergonomics. There are several standard guidelines, yet they are still deficient for certain groups of people. As an architect or designer, one should realize the importance of having the supporting fixtures namely handrail and seating in such a wet area. However, do the existing mosques comply with the needs of the female elderly specifically in terms of the anthropometrics and ergonomics of the ablution units? Masjid Sultan Ahmad and Masjid Geliga, Kemaman, Terengganu are the selected mosques for this case study. A survey method was conducted in this study which employed the result of both a series of observations and questionnaires that had been distributed to 30 randomly selected female elderly respondents aged 60 years old and above. In general, this paper contains the comparison data between existing guidelines and existing ablution units' dimension and how they affect users' satisfaction towards the ablution units in regard to anthropometrics and ergonomics. It showed most of the respondents are satisfied with the dimension of existing components for the ablution units at both mosques.

Keywords: Ablution units, Female Elderly, Anthropometrics and Ergonomics, Mosque

1.0 INTRODUCTION

The comfort ability of space for users is one of the main factors in designing a space. The users' experience can be the fundamental aspect in the design process. "In Malaysia, set of Malaysia Standard has been developed as a guideline for the developer and designer to build public facilities which can be accessible by the vulnerable group such as elderly and disabled population to provide design specification such as height of ramp and handrail, slope of ramp and finishing material" (Dawal, 2016). This research is conducted to study about the components of ablution units at selected mosques in terms of height, arm reach and distance that affect the female elderly. Many of the old-designated mosques had failed to pay attention to these aspects in the design of ablution area for this category of users. The purpose of this paper is to identify the most suitable design for ablution area in regard to the anthropometrics and ergonomics for the elderly. The three selected components of ablution area selected to be studied are namely the handrail, seating and water tap and these aspect are compared between the two mosques.

2.0 LITERATURE REVIEW

In this section, it will briefly explain the focused keywords which are wudu' (ablution), female elderly, anthropometrics and ergonomics, in terms of the definition and the significance towards this paper. As most people know, Wudu' (in Arabic) is one of the Islamic procedures that can be considered as ritual purification which is carried out to seek the blessings from Allah which involves cleaning some important parts of the body, including hands, mouths, arms, head and feet with water. For design purpose, designer or architects need to take in all aspects such as safety, comfortability and support facilities into consideration without ignoring the needs of the elderly in order for the users to achieve satisfaction of ablution area's anthropometry and ergonomics. In addition, when it comes to wudu', it is usually

interrelated to the word ‘mosque’ which can be defined literally as a place for Muslims to prostrate which comes from the actual word of *sajada* that brings the meaning of prostrate and act as the center gravity for the community of Islam which is not only charging for the Muslims to perform prayers but also apart of social congregation such as knowledge center, building. It is an overall obligation to ensure each and every spaces in mosque are accessible to all especially the elderly users.

As referring to the main purpose of this paper, some of the definitions regarding to anthropometrics can be literally use in relative to specify the physical dimensions. The main points to consider in designing are the issues for example, of height and reach while on the wheelchair, leg room while accessing, front and side hand reach distances, and the free space required to maneuver around the area. In relation to anthropometrics and ergonomics, ablution units that become the concentration in this paper are seats, handrail and water tap as in Malaysia, set of Malaysia Standard has been developed as a guideline for the developer and designer to build public facilities which can be accessible by the vulnerable group such as elderly and disabled population to provide design specification such as height of ramp and handrail, slope of ramp and finishing material (Dawal 2016).

3.0 METHODOLOGY

The research starts with the findings on the definitions of the keywords of this research, Anthropometric & Ergonomic, Ablution Area, Mosque, Elderly Female. Quantitative method were chosen for this study involving the process of observation and evaluation, and conducting interview sessions with 30 randomly selected users at the two chosen mosques, Masjid Geliga Kemaman and Masjid Sultan Ahmad Kemaman, Terengganu. There are two stages involved involving case study on the selected mosques; Masjid Geliga Kemaman and Masjid Sultan Ahmad Kemaman. . Next is the evaluation stage where dimensions and supporting facilities of ablution areas at the selected mosques will be measured and recorded in the evaluation form. Questionnaires will then be distributed to the users (from selected category ; elderly and disabled users) to find out any problems or dissatisfaction from those units determined in the primary stage. At the end of this paper, the findings will be presented as a comparative study between the two mosques with regards to the elderly females’ satisfaction of the anthropometry and ergonomy of ablution units based on the respondents’ feedback.

4.0 ANALYSIS AND FINDINGS

Table 1: Differences between existing components of ablution units and guidelines

	Dimension (mm)	Masjid Geliga	Masjid Sultan Ahmad	Existing Guideline (with seat)	Existing Guideline (no seat)
1.	Tap height	880	800	740	940
2.	Tap distance(from user to tap)	300	560	730	730
3.	Seat height	-	480	380	-
4.	Seat width	-	330	400	-
5.	Seat length	-	330	400	-
6.	Drain width	300	400	410	500
7.	Floor rise	60	10	15	15
8.	Floor width(if no seat)	600	600	700	700
9.	Handrail height	-	1000	940	940
10.	Handrail distance(from seat)	-	630	810 (based on arm reach forward)	810 (based on arm reach forward)

Based on the Table 1 above, several dimension of existing ablution units are slightly different from the existing guidelines. It is clear from this study that most of the elderly prefer to sit while taking ablution rather than standing for quite some time. It has been proven that the seats provided are satisfactory to the users regardless of its height and seat provision. The result was determined based on the feedback from 30 respondents aged 60 years old and above who answered the questionnaires that had been distributed to them. As a result, majority of the elderly prefer to have seats at ablution units which act as physical supporting fixture that respond to their physical condition. Some of them have to endure the difficulty to stand and bend their body for a long time and get their clothes wet due to the splash of. Despite that, the height of existing water taps for both mosques was considered acceptable as users did not experience back pain and knee pain. This is because the tap is installed higher than the limitation postures of users. Thus, it shows that Masjid Sultan Ahmad provides the facilities that closely meet the guidelines requirements and meet the satisfaction of the users. Based on the result analysis, it can be seen that the existing guidelines especially for the seat and water tap height must be researched further as changes may be required. In order to reduce any discomfort and to ensure the safety of the users, further study on anthropometric dimensions of these two components should be taken into consideration in future planning to improve the design.

Table 2: Users' Satisfaction on Ablution Units

Factor	Qualities	Masjid Geliga		Masjid Sultan Ahmad	
		User Satisfaction	User Dissatisfaction	User Satisfaction	User Dissatisfaction
Seat	Seat height	-	0.70	0.88	0.06
	Seat provision	-	0.70	0.50	0.38
Water Tap	Tap distance	0.78	0.30	0.56	0.19
	Tap height	0.43	0.07	0.25	0.15
Handrail	Handrail height	-	0.78	0.19	0.75
	Handrail distance	-	0.78	0.19	0.75

5.0 CONCLUSION

As a conclusion, a mosque is a place that connects between the users and a place which not only focuses on the functions, but also on the emotional and spiritual dimensions. To create such a place, it must be well-designed to not neglect others' needs in regards to all capabilities, limitations and abilities. Based on three selected components of ablution units, it shows that the importance of considering the aspects which could help the elderly to feel welcome every time they visit the mosque and which prevent them from any health problems. The existing ablution units for each mosque have their own advantages and disadvantages which lead to the satisfaction and dissatisfaction of the users. However, to summarize, the existing dimension of seating and water tap are preferable to the when compared to the standard guidelines. The results highlighted that the significant factors in providing supporting fixture at wudu' (ablution) workstation are the right postures within the limitation and ability of the elderly people. The significant body parts that related to components of ablution units that need to be improved are arms and leg. Therefore, it is hoped that this effort will become one of the significant social contributions for the future for this group of aging population in order to develop this nation holistically.

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