

# Finding the Right Fit: A User-Centric Approach to Master Bedroom Sizing in Compact Dhaka Apartments

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## ABSTRACT

Due to high land prices and rising construction costs, compact apartments have become the most affordable option for Dhaka's middle-income population. Within these smaller living spaces, the master bedroom remains a critical area for comfort and functionality. However, designers often size master bedrooms based solely on the minimum requirements set by building bylaws, overlooking the cultural and personal needs of a diverse range of users. This disconnect frequently leads to post-purchase dissatisfaction among apartment buyers. To address this gap, this study aimed to establish a standard dimension for master bedrooms in compact apartments in Dhaka, one that can accommodate a wide variety of user needs. The research employed a combination of structured and unstructured field surveys to understand the diverse lifestyles and spatial requirements of different middle-income user groups. This data was then used in a user-centric layout study to determine the optimal sizing for master bedrooms. The findings of this study provide valuable insights for architects and interior designers, encouraging them to consider user-specific needs alongside spatial efficiency. This approach challenges the trend of blindly compacting living spaces, offering a more balanced and user-oriented design solution for Dhaka's middle-income population.

## 1. INTRODUCTION

Due to rising land prices and the gradual increase in construction costs, small-sized flats in multi-story, multi-family residential buildings have become more affordable for the middle-income population in Dhaka [1]. Before the emergence of the apartment culture, middle-income residents typically bought land and built single-family houses. However, after Dhaka became the capital and central business hub of an independent country, a sudden surge in residential demand drastically altered its housing scenario, giving rise to multi-story, multi-family apartment buildings [2, 3].

Initially, when middle-income residents began adapting to apartment living, they preferred spacious units to replicate the openness of a single-family home. Although flats have become increasingly compact over time, cultural norms and family structures have discouraged the popularity of compact studio apartments. Instead, buyers continue to prefer small-sized units that include a master bedroom, a child's bedroom, and a guest bedroom [4, 5].

To meet this demand, architects have continuously worked to reduce spatial dimensions. However, the

ideal minimum size of a master bedroom remains under-researched. Most architects design master bedrooms keeping in mind the minimum requirements outlined in building bylaws (a minimum width of 2500 mm and a floor area of 9.5 sqm, as per the Dhaka City Building Construction Act, 2008 [6]), and therefore, often neglect user-centered needs. Consequently, buyers—often unaware of spatial dimensions—may experience dissatisfaction after purchase, attempting to adapt to the limited space and ultimately compromising their quality of life. Nonetheless, spatial compaction is an unavoidable reality in Dhaka's urban context [7, 8].

According to a recent report, bedroom sizes in urban areas like Dhaka have shrunk by approximately 29% between 2020 and 2021 [9]. While some existing studies have attempted to identify apartment size preferences for different income groups in Dhaka [1], literature specifically addressing user-centric master bedroom sizing in the context of Dhaka apartments remains absent. Against this backdrop, this research aims to identify the optimal master bedroom size that can satisfy the needs of middle-income flat buyers in Dhaka.

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## 2. METHODOLOGY

The middle-income population of Dhaka constitutes the primary market for the growing trend of compact apartments. Most of these potential buyers currently reside in rental units across the city [10-12]. For this study, Khilkhet—a well-known neighborhood in Dhaka—

was selected as the study site. Khilkhet was chosen specifically because it accommodates middle-income tenants from diverse occupational backgrounds, allowing the study to capture a wide range of lifestyles and spatial needs [13, 14]. An unstructured interview and a structured questionnaire survey were conducted among the master bedroom users in 100 apartments in this area.

**Table I:** User-specific Needs

Occupation (Male)	Occupation (Female)	User Number	Bedroom use	Furniture Requirement	Number Surveyed
Student/ Office worker		Single (1)	1. Sleeping/ Relaxing 2. Working 3. Entertainment 4. Yoga/Exercise	1. Single Bed 2. Desk & Chair 3. Almirah	1
	Student/ Office worker	Single (1)	1. Sleeping/ Relaxing 2. working 3. Entertainment 4. Yoga/Exercise	1. Single Bed 2. Desk & Chair 3. Dressing table 4. Almirah	2
Office worker (private)	Housewife	Couple (2)	1. Sleeping/ Relaxing 2. Working 3. Entertainment 4. Prayer	1. Double Bed 2. Desk & Chair 3. Dressing table 4. Almirah	9
Office worker (private)	Housewife	Couple with infant (3)	1. Sleeping/ Relaxing 2. Entertainment 3. Playing (Baby) 4. Prayer	1. Queen size Bed 2. Desk & Chair 3. Dressing table 4. Almirah 5. Sofa/Easy chair 6. Shelf	48
Office worker (private)	Office worker (private)	Couple (2)	1. Sleeping/ Relaxing 2. Entertainment 3. Prayer	1. King size Bed 2. Desk & Chair 3. Dressing table 4. Almirah	8
Doctor	Housewife	Couple with infant (3)	1. Sleeping/ Relaxing 2. Entertainment 3. Playing (Baby) 4. Prayer	1. Queen size Bed 2. Desk & Chair 3. Dressing table 4. Almirah 5. Sofa/Easy chair 6. Shelf	3
Banker	Housewife	Couple with infant (3)	1. Sleeping/ Relaxing 2. Entertainment 3. Playing (Baby) 4. Prayer	1. Queen size Bed 2. Desk & Chair 3. Dressing table 4. Almirah 5. Sofa/Easy chair 6. Shelf	4
Teacher	Housewife	Couple with infant (3)	1. Sleeping/ Relaxing 2. Studying 3. Entertainment 4. Playing (Baby) 5. Prayer	1. Queen size Bed 2. Desk & Chair 3. Dressing table 4. Almirah 5. Sofa/Easy chair 6. Bookshelf	5
Businessman	Housewife	Couple (2)	1. Sleeping/ Relaxing 2. Entertainment 3. Prayer	1. Double Bed 2. Side table 3. Dressing table 4. Almirah	4
Businessman	Housewife	Couple with infant (3)	1. Sleeping/ Relaxing 2. Studying 3. Entertainment 4. Playing (Baby) 5. Prayer	1. Queen size Bed 2. Desk & Chair 3. Dressing table 4. Almirah 5. Sofa/Easy chair 6. Bookshelf	16

Participants were selected based on two primary criteria:

- (1) the participant must be a tenant; and
- (2) the participant must belong to the middle-income group. (in 2022-2023 the BBS categorizes individuals earning between Tk 50,000 and Tk 120,000 per month as middle-income [15]).

The interviews (both structured and unstructured) aimed to identify the master bedroom-related needs of user(s) from different occupations. Based on these identified needs, the study outlined the maximum set of furniture requirements necessary to meet them. In the next stage, both desk-based and field research were carried out to determine the standard dimensions of furniture available in Dhaka's furniture market. During the survey, the bedroom configurations of each respondent were meticulously documented, from which eight common room configurations were identified. Using ergonomic principles, several compact bedroom layouts were then designed and evaluated for usability.

Finally, by synthesizing the findings from multiple layout studies, the research proposes an optimal minimum bedroom size that can accommodate the needs of most middle-income buyers of compact Dhaka apartments across various occupational groups.

### 3. DATA ACCUMULATION AND SYNTHESIS

A total of 100 apartments were surveyed, and the users were asked about the additional uses of their master bedrooms beyond sleeping. Responses varied significantly, revealing diverse usage patterns. Through data synthesis, it was identified that these variations were closely linked to the respondents' occupational backgrounds and the number of users sharing the room. Table I presents the respondents' occupations, number of users, their specific uses of the master bedroom, and the types of furniture required to support those uses. Based on the analysis of Table I, the maximum uses of a master bedroom are as follows: sleeping, working at a desk, storing clothing, playing with children, praying, keeping books and work/entertainment equipment (e.g., laptop/desktop PC, sound system), relaxation, and dressing. These uses may vary depending on the occupant's occupation and user number, with some user(s) requiring only a subset of these uses, while others may need all of them. Therefore, if a master bedroom can effectively accommodate the full range of activities, it is likely to satisfy the needs of most user(s),

regardless of their occupational background or user number.

Table I also outlines the furniture required to support each specific use of the master bedroom. Based on this data, accommodating the full range of potential uses necessitates the inclusion of the following essential furniture items: a king-sized bed (the largest amongst standard bed types), a desk and chair for working and keeping PC, a wardrobe for clothing storage, a bookshelf, a sofa or easy chair, and a dressing table. (Note: This study does not consider integrated interior designs that utilize customized, space-saving furniture solutions.) Additionally, to facilitate activities such as prayer, yoga/exercise, and play, a clear and unobstructed area within the room is essential.

In the next phase of the study, the dimensions of the required furniture were determined through a survey of local shops and an analysis of size specifications provided on the websites of several renowned Bangladeshi furniture brands [16-18]. The following Table II presents a comparison of furniture sizes across different branded manufacturers as well as locally produced, non-branded options.

From the analysis of the Table II, the following maximum furniture dimensions were identified as the largest commonly available sizes in the Bangladeshi furniture market:

1. King-sized Bed – 2280 × 2000 mm
2. Almirah (3 part) – 1500 × 600 mm
3. Dressing Table – 800 × 430 mm
4. Work Desk – 1000 × 550 mm
5. Single Sofa – 850 × 750 mm
6. Bookshelf – 600 × 400 mm
7. Wardrobe – 1330 × 550 mm
8. Easy Chair – 1300 × 700 mm

Calculation of Required Open Space for Prayer, Play, and Yoga/Exercise: In this study, “prayer” specifically refers to Salat (Islamic worship), which requires orientation toward the Qibla—westward in the context of Dhaka. A standard prayer mat typically measures 1200mm by 750 mm. Since room orientation may vary, a clear space of at least 1200mm by 1200mm is considered sufficient to accommodate prayer regardless of layout. For yoga, a space of approximately 1800 mm by 900 mm is generally required. Therefore, to accommodate prayer, yoga, and activities such as playing with an infant, a clear, unobstructed area of 1800 mm by 1200 mm within the master bedroom is deemed adequate.

In the next phase, several furniture layout options were analyzed using the maximum dimensions identified in the previous step. These dimensions represent the largest commonly available sizes in the Bangladeshi market, meaning that any smaller-sized furniture would

provide additional free space in the room. For instance, if a user chooses a single bed instead of a king-sized bed, the available floor space will increase, offering greater flexibility in the room layout.

**Table II:** Furniture Size Comparison

Furniture Name		Furniture Size			
		Hatil (mm)	Otobi (mm)	Regal (mm)	Local Shop (mm)
1. Bed	Single	-	2050 × 1080	2075 × 1096	2000 × 1000
	Queen Size	2220 × 1655	2100 × 1750	2100 × 1590	2050 × 1500
	King Size	2220 × 1880	2105 × 1887	2280 × 2000	2100 × 1850
2. Almirah	2 Part	900 × 500	962 × 580	1000 × 595	950 × 500
	3 Part	1470 × 600	1500 × 565	1500 × 600	1450 × 600
3. Dressing table		800 × 400	800 × 430	800 × 400	800 × 400
4. Working Desk		460 × 505	1000 × 550	1000 × 500	950 × 500
5. Sofa (single)		800 × 750	820 × 750	850 × 750	800 × 750
6. Bookshelf		485 × 400	600 × 325	600 × 300	550 × 300
7. Wardrobe		1250 × 585	1330 × 510	1200 × 550	1100 × 550
8. Easy chair		700 × 960	1300 × 660	1025 × 575	700 × 900

#### 4. LAYOUT STUDY & RESULT

At the outset of the layout study, the required clearance for each piece of furniture was determined based on guidelines from Time-Saver Standards for Interior Space Planning [19], a widely recognized reference book used by architects globally. The recommended clearance dimensions are as follows:

**Table III:** Furniture Clearance

Furniture	Minimum Clearance Required
Bed	560 mm (at least on one side, preferably on two sides)
Wardrobe / Almirah	915 mm (in front)
Dressing Table	1065 (in front)
Working Desk	760 (in front)
Bookshelf	560 mm (in front)
Sofa	560 mm (in front)
Easy Chair / Rocking Chair	560 mm (in front)

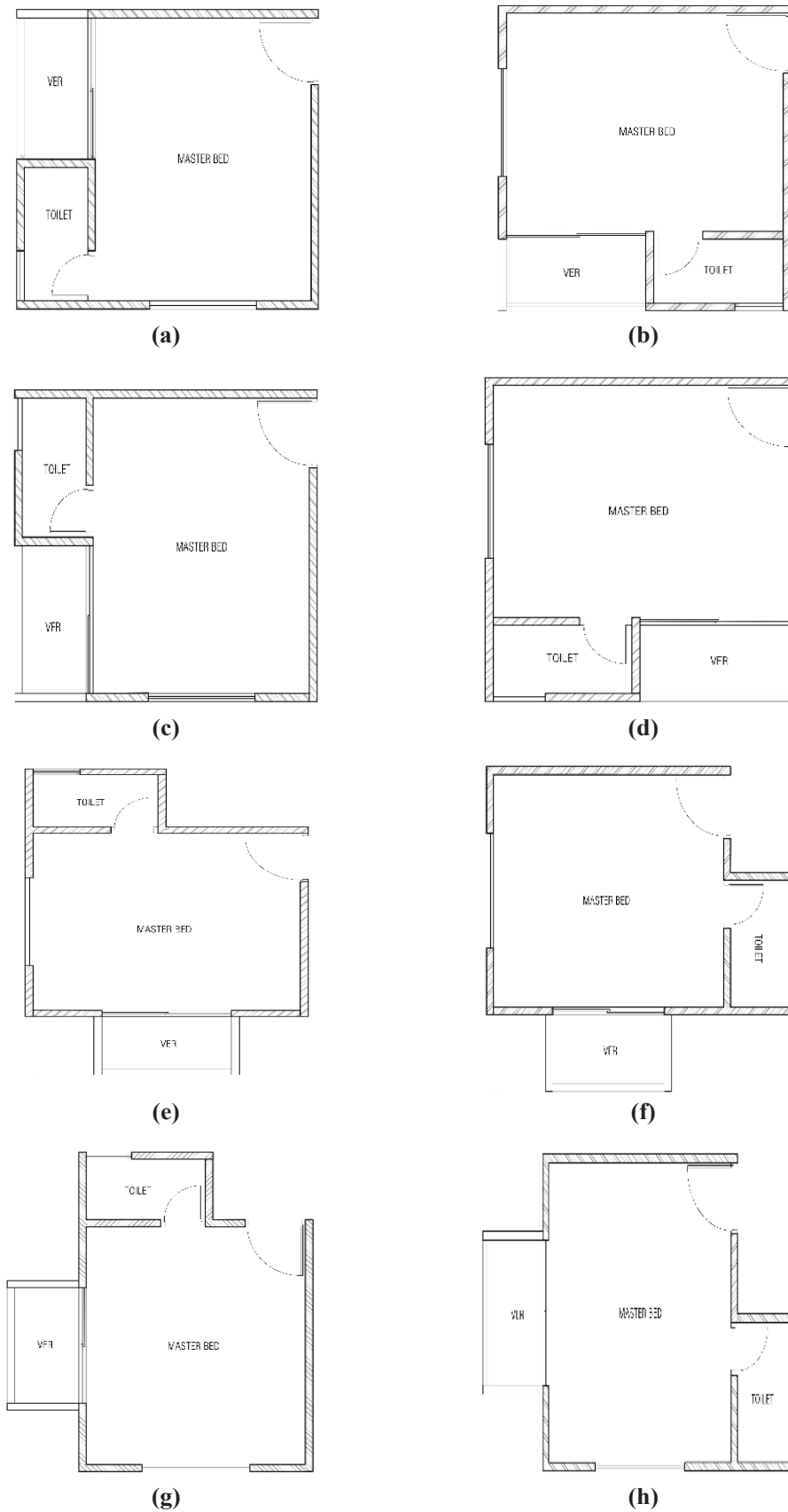
Next, eight potential master bedroom plans—along with their mirrored versions (through Y axis, totaling 16 plans)—were identified based on common typologies observed in the survey. For further analysis, only one plan from each mirrored pair was selected and these are shown in Fig. 1 (a) to (h). In each plan, the required furniture

was arranged with careful consideration of clearances (listed in Table III) and functional requirements. After finalizing the furniture layouts, the overall dimensions of each room were measured. These measurements represent the primary findings of this study, though slight variations were noted across different room configurations.

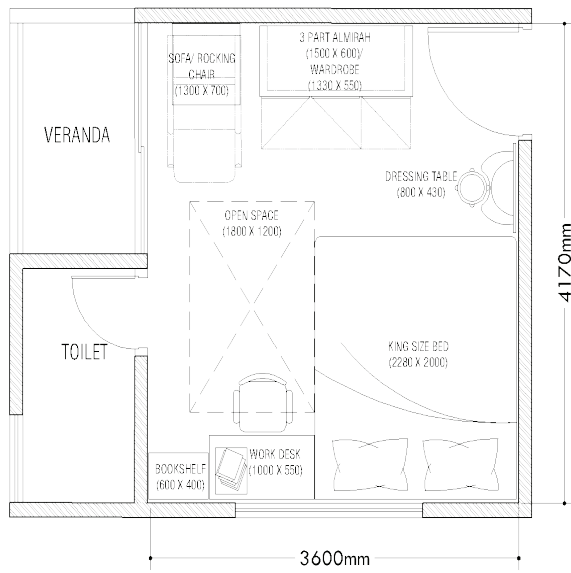
Table IV presents the room dimensions for eight different bedroom configurations. It is important to note that the standard clearance of 560 mm on the pillow side of the bed was omitted, considering the practical use of a bed. In some cases, the chair positioned at the work desk slightly overlaps with the designated open space; however, this was deemed acceptable, as chairs are considered movable furniture.

**Table IV:** Room Size Comparison

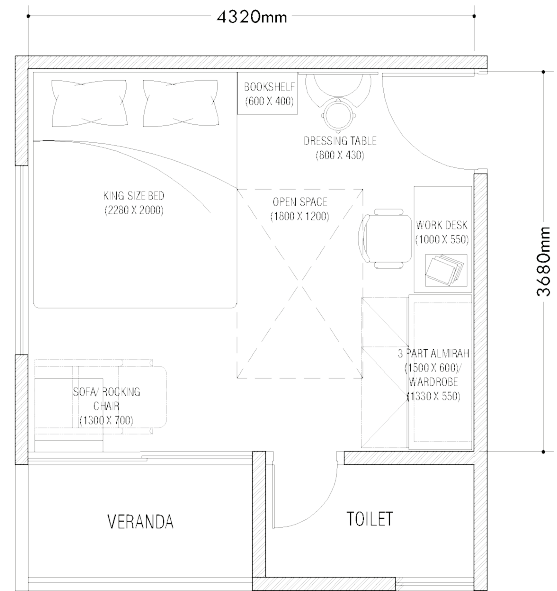
Configuration No	Size (mm)
Fig. 2(a)	4170 × 3600
Fig. 2(b)	4320 × 3680
Fig. 2(c)	4320 × 3680
Fig. 2(d)	4060 × 3680
Fig. 2(e)	4070 × 3680
Fig. 2(f)	4070 × 3680
Fig. 2(g)	4070 × 3680
Fig. 2(h)	4190 × 3670



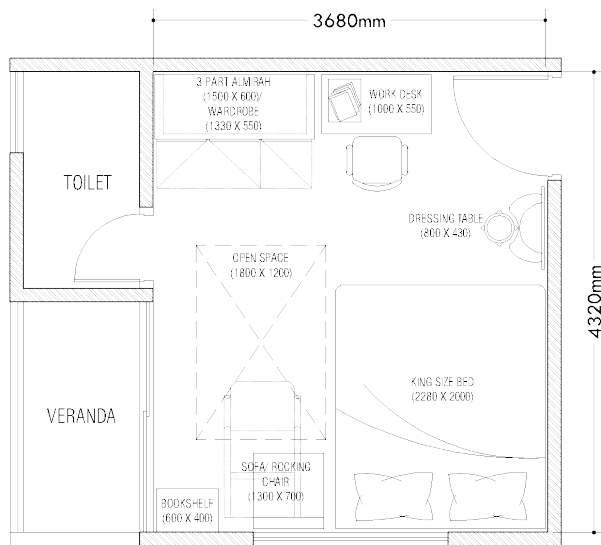
**Fig. 1:** Master Bedroom Plans



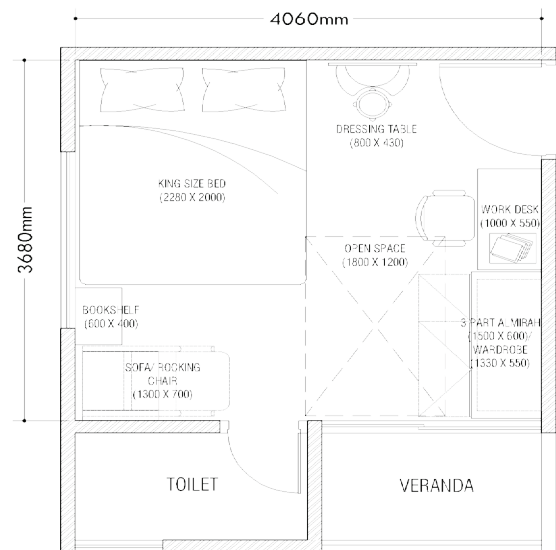
(a)



(b)



(c)



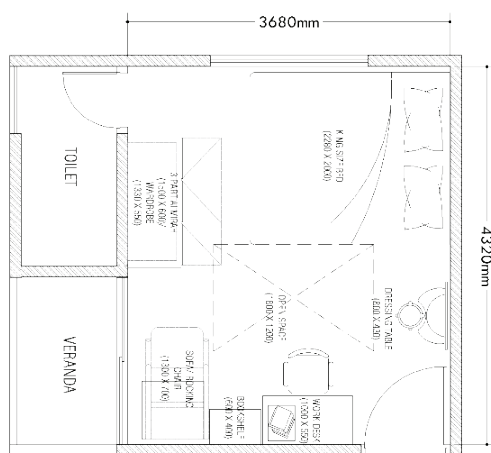
(d)



**Fig. 2: Master Bedroom Plans with Dimension and Furniture**

Based on the maximum dimensions derived from Table IV, it is concluded that a master bedroom measuring 4320 mm × 3680 mm can accommodate the full range of essential furniture identified in the survey. However, room configuration plays a critical role in space usability. The placement of key elements such as doors, windows, verandas, and toilet doors significantly influences the layout possibilities. These spatial constraints were carefully considered during the layout analysis. For instance, in Fig. 2(h), if the veranda door were located at the top-left corner instead of the center, the current furniture arrangement would still be functional. Similarly, here if the toilet door is positioned at the bottom-right, shifting the work desk and bookshelf upward would maintain functionality without altering the room's dimensions. This principle holds true across other configurations as well.

The layout analysis, conducted through rigorous design iterations, established that a room size of 4320 mm × 3680 mm can successfully accommodate the complete set of furniture. For example, in Fig. 2(d), if the toilet door is relocated to the bottom-left corner, increasing the room length from 4060 mm to 4320 mm resolves spatial limitations. This modified arrangement is illustrated in Fig. 3.



**Fig. 3:** Modified Arrangement of Bedroom

This holds true for other configurations as well. The study meticulously explored more than four variations in the locations of doors, windows, verandas, and toilet entrances for each bedroom configuration, testing which room dimensions could accommodate the full range of essential furniture. The dimension of 4320 mm × 3680 mm consistently performed well in every scenario. In some cases, slightly smaller dimensions were workable, but the required size never exceeded 4320 mm × 3680 mm.

Therefore, it is recommended that designers do not design master bedrooms smaller than 4320 mm × 3680 mm. However, careful attention must be paid to the room configuration, particularly the placement of the main door, veranda door, toilet entrance, and window(s).

Additionally, the set of maximum uses identified in this research provides valuable insight into the functional requirements a master bedroom in a compact apartment should fulfill—especially when the actual end user is unknown.

## 5. CONCLUSION

Compact apartments have become an unavoidable reality in Dhaka, where escalating land prices and rising construction costs make smaller living spaces the only affordable option for much of the city's middle-income population. However, maintaining cultural norms and meeting the personal needs of residents remain essential considerations in apartment design—considerations that are often overlooked in developer-led projects where the end user is unknown.

This study addresses that gap by offering a practical resource for architects and designers. It provides insights into optimal master bedroom dimensions and furniture arrangements, enabling designs that accommodate a wide range of family structures and occupational needs—even within compact apartments. While the study's sample size is limited to 100 respondents, they represent a diverse cross-section of Dhaka's middle-income households, offering a reasonable foundation for design guidance.

Future research with larger sample sizes and more comprehensive datasets could further refine these findings, contributing to the development of more precise and user-centric guidelines for master bedroom design in the context of Dhaka's evolving urban housing landscape.

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## APPENDIX

### Questionnaire Used During the Survey

Question	Response Options
1. Are you a tenant?	1. Yes    2. No
2. What is your monthly income?	1. 10,000 – 49,000 BDT 2. 50,000 – 120,000 BDT    3. Over 120,000 BDT
3. What is your occupation?	Open-ended (recorded as per response)
4. Are you planning to purchase an apartment in Dhaka in the future?	1. Yes    2. No
5. What is the size of your current master bedroom?	Documented during field survey
6. How many people share this bedroom?	1. One 2. Two (Couple) 3. Three (With infant)
7. What activities do you currently perform in your bedroom?	Open-ended (recorded as per response)
8. What activities would you like to perform in your future bedroom (in a purchased apartment)?	Open-ended (recorded as per response)
9. What furniture do you currently use in your bedroom?	Open-ended (recorded as per response)
10. What additional furniture do you think you need?	Open-ended (recorded as per response)

