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The Influence of the Private Living Areas on the Sense of Belonging to Place in the Design of Student Residences; Case Study: Yazd University Dormitories*

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ABSTRACT

Entrance to university is a new stage of life for many students, and the experience of living in a dormitory is a different experience of residence for them. Now, most student dormitories cannot meet the qualitative needs of students' residences. Conflicting activity areas exist in these dormitories; hence, students highly prefer to control and manage their interactions and communications with others. Accordingly, privacy is one of the components of a place that influences the sense of belonging to the place. The extant study aims to explain the relationship between privacy provisions in the dormitory and its effect on the sense of belonging to students. This study was conducted based on the descriptive-correlational method, and required data were collected through questionnaires and field studies. Dormitories of Yazd University were investigated as the case study. After reviewing the theoretical views and foundations of the survey quantitative and qualitative analyses were done using SPSS software and content analysis of interviews. According to study results, the most significant factors for the realization of privacy in student dorms can be classified to control over visual and auditory factors and access rate. The most important factor influencing a "sense of belonging" to the student residence place includes perceptual-cognitive factors (that are mainly influenced by the architecture and residence place), social factors (concerning roommates), and having suitable physic. The results indicate that student's sense of belonging to the dormitory is considerably influenced by the desired privacy in the dormitory place for them. Finally, some recommendations have been proposed based on the mentioned factors to optimize the dormitory living conditions in future designs.

Keywords: Student Residence, Privacy, Sense of Belonging to Place, Dormitory of Yazd University.

1. INTRODUCTION

Dormitory design considers the rooms that are cost-effective for students without paying attention to other needs of them, such as facilities for studying and leisure activities. It has been neglected in these places that environment and scape dramatically influence the behavior and feelings of the human (Hamidian Divkoilaie and Haghani 2020, 2). Few rooms with small areas next to each other with public services, sitting rooms and kitchens that students have to share them affect some criteria, such as privacy, comfort, and convenience, and sense of belonging (Ali Abadi et al. 2010, 4). However, such social tensions and stresses between individuals seen in the design of student dormitories located in Iran have led to dormitory place hatred that subsequently hurts the individuals' sense of belonging to this environment (Heydari and Abdipour 2015, 73). The extant study reviews some samples of a student dormitory in Yazd, and then determines the interaction between privacy and sense of belonging in such places.

Sense of belonging and privacy provision are basic needs of humans. Sense of place attachment even affects the mental and moral health of humans (Hagerty et al. 1991, 172). The present study tries to present a useful guideline for designers helping them to find shortcomings in the design of dormitory environments and enhance the quality of lives of students who live in dormitories. For this purpose, this study used the post-occupancy evaluation (POE) of architecture, assessed the factors affecting the sense of belonging, and defined privacy, and examined the relationship between these categories. The main questions of the study include: what factors and how affect the privacy area of students in student dormitories? To what factors do the students' sense of belonging to dormitories they live depend? What kind of relationship exists between privacy provision and individuals' sense of belonging in student residences?

1.1. Background

Many studies have been conducted on private areas and the sense of belonging to the place, and the most important and relevant ones are reviewed herein. Abdul Rahim et al. (2011) addressed the importance of privacy, believing that uncertain spaces without no specific private or public characteristics prevent control over social interaction and cause conflict.

According to studies conducted by Mojtabavi and Sedaghat (2021), a sense of belonging is created by internal and external factors. The internal factors consist of individuals' cognition and perceptions that influence their feelings, while external factors include social and physical components that affect humans from the outside. They believe that physical components are influenced by color, geometry, materials, natural and artificial lights, scale, diversity, beauty, and natural elements. Karimi et al. (2021)

pointed to the concept of a sense of place or belonging as being at home in the past, while this sense is not defined as an emotional relationship between a person and place. They considered the sense of belonging influenced by various factors. The authors of a paper entitled "the relationship between people and place: the sense of belonging" (2018) explain that individuals make the emotional relationship with those places that bring satisfaction, security, and comfort because places allow them to control conditions and create opportunities for privacy provision.

Scrima et al. (2021) investigated the relationship between a sense of place attachment, satisfaction, privacy, and exhaustion in the workplace. Regarding the workplace, they defined three types of privacy: 1. conversational privacy, which refers to transmitting a message without being heard by third parties; 2. acoustic privacy, which includes the control of the conversation, without the interference of others, and the possibility of isolating oneself from environmental noise; 3. visual privacy, which points to the possibility of isolating oneself from unwanted glances.

Heydari and Abdipour (2015) evaluated the role of privacy in promoting place attachment in student dormitories. They assume that residents who live in student dormitories expect a home-like function of the dormitory to provide their privacy. Therefore, satisfaction with dormitory areas highly depends on the spatial control and desired privacy provision in these places.

Motazedian and Motallebi (2014) explained in their paper that student residence halls that are not designed based on the standards and behaviors of students cannot meet their needs making them keep the territory and create their desired privacy through some mechanisms. If this attempt requires customization and definition of territory beyond the aesthetical needs, high energy and time must be spent, which hurts the quality of life and morality of individuals in the short or long term.

2. THEORETICAL FRAMEWORK AND CONCEPTS

The research subject requires theoretical discussion on the difference between "residence hall" and "dormitory" and an explanation of "privacy" and "sense of belonging or sense of place" concepts considering their interaction in the available literature.

2.1. Terminology: What is "Residence Hall" and its Difference from "Dormitory"

The term "dormitory" mainly reflects a space just for sleeping without any other application. Ironically, the same condition is seen in the real world, while dormitory space must also be ideal for doing different social activities and satisfying the individual needs of students. In other words, dormitory rooms must be designed to meet students' needs not just for sleeping

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(Kilcaslan 2013). However, the word "residence" means staying and resting in Dehkhoda Dictionary and reflects peace and relief in common literature. It seems that the same case remains until we call the residence place of students a dormitory, which is evaluated and designed regarding their sleeping capacities.

2.2. Views and Theories about "Privacy"

Privacy definitions have one point in common; all of them consider the ability of a person or a group of individuals to control audio, visual, and olfactory interaction with others (Lang 1987). Considering a general definition, Lang defines privacy as a part of an individual's life that they control in their private area away from the public view and information or power of government and officials. Private life means living away from public areas that have negative aspects and failure feelings; hence, privacy is a part of life under the control of personal potential beyond the public view and knowledge and governmental control

(Madani Pour 2010, 58-60).

Georgiou names five different factors (accessibility, visibility, proximity, vocals, and olfactory) influencing the privacy analysis book by Hall. All of the mentioned factors affect the human's perception of the surrounding environment and mechanism of control over their privacy (Georgiou 2006, 18). Abu-Gazzeh expresses the common major definition by analyzing diverse interpretations of the concept of human privacy: "a process that aims to control negotiations between individuals to enhance autonomy and or minimize vulnerability." In his opinion, privacy provides three main functions: limiting social interaction, establishing plans and strategies for interaction management, and maintaining and developing self-identity (Abu-Gazzeh 1996, 271). According to Altman (1975), privacy is observed through behavioral mechanisms that may exist, such as verbal, non-verbal, and environmental mechanisms (Rafieian and Mohammad Niay Gharaie 2012, 315).
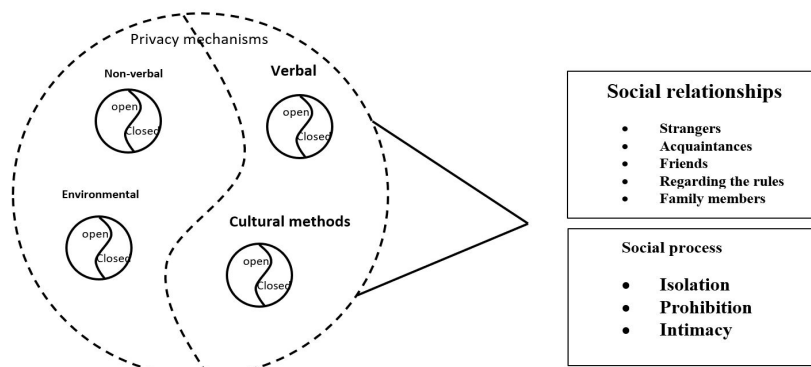

Fig. 1. Privacy Regulation Framework Concerning Culture
(Altman 1977)

Privacy must be classified regarding visual, vocal, and accessibility factors (Rahim and Abu Hassan 2011). "A room must allow members of a group to interact with each other, meanwhile giving them privacy in that space," Alexander explains about the privacy provision for several people in one room

(Alexander 2009, 410). For instance, the designed pergolas (indentations) must be large enough for two members allowing them to sit there and talk to each other, especially when one student wants to study while the noise of the environment distracts them.
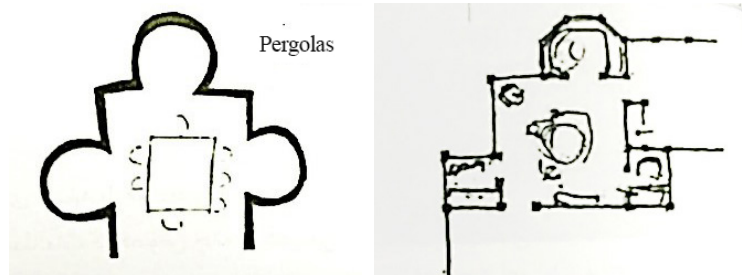

Fig. 2. Pergolas
(Alexander 2009, 410)

According to available definitions and other studies about privacy areas, the relevant concepts can be

divided into 9 categories:

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Table 1. Privacy Indicators

	Privacy Indicators	Theorist	Year	Provided Definition
1	Interaction Regulation	Johnson	1991	Regulating interaction between self and others or against environmental stimuli
		Schwartz	1986	Creating a level of privacy, which does not mean the tendency to have access to social isolation but is a communicational mechanism and guideline for social behaviors of humans indicating social and physical boundaries simultaneously, which separates two different spaces
		Gifford	1977	Privacy is known as a specific cultural process that uses some mechanisms for social interaction regulation (Gifford 1977, 86)
		Al-Thahab	2014	This author defines privacy as a mechanism for developing and maintaining the procedure in mutual relationships between individuals in a small social group or the whole society (Al-Thahab et al. 2014, 230)
2	Control	Pederson	1999	Unlike public opinion, privacy does not necessarily mean isolation but is about controlling the time and extent of contact with others
		Rapport	1977	Rapoport defines privacy as the ability to social control and selects the desired level of social relationships
3	Right to Being Alone	Warren & Brandies	1890	Warren and Brandies explain that the current initiatives and business techniques have led to the next step to individual protection and security provision bringing the right to privacy and being alone
4	Right to Privacy	Posner	1998	Privacy is the right to hide unbelievable truths about self
		Westin	1967	Privacy is the claim of individuals, groups or institutes determine for themselves when, what, and how the relevant information is announced to others
5	Developed Intimate Relationships	Julie Inness	1992	She defined privacy as the authority to control some intimate decisions
6	Limited Access	Anita Allen	1988	She defines privacy as limited accessibility
		Gavison		Gavison defines privacy as "limited accessibility" with three separate but related components: confidentiality (available information about an individual), anonymity (attention paid to a person), and being alone (physical accessibility to a person). Privacy will be destroyed when one of these areas is violated (Madani Pour 2003, 60-62)
7	Freedom of Action	Margulis	2005	Privacy provision has been defined as freedom or freedom of action in personal affairs in this context
8	Protection of the Range Activities	Solove	2008	Privacy is not just freedom of social control but is a kind of social structure protection. Privacy value is not created by any kind of privatization structure but protects a wide range of its activities (Solove 2008, 174)
9	Isolated from a Group or Individual View	Bernadou	1974	Privacy is a necessary prerequisite for effective social structure-function. It is resistance against being watched over the behavior, which stems from structural properties of collective life
		Georgiou	2006	Privacy is defined as the quality or isolation from the group or view of individuals (Georgiou 2006, 11)

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2.3. Sense of Belonging to Place

The place is the main element of its residents' identity. Individuals can know themselves by knowing the place (Habibi 2008). Sense of place is a complicated combination of notions, symbols, and qualities that a person or group perceives in a specific space or region consciously or unconsciously (Shamai 1991). Sense of place brings coordination and suitable function in architecture and human space, but also provides a sense of security, pleasure, and emotional perception and improves the identity and sense of belonging to a place among individuals (Altman and Low 1992). In general, a sense of belonging can be considered one of the aspects of a "sense of place." Sense of place is identified by the person in the environment, which is divided into three aspects: "place identity," "place belonging," and "place attachment." Place identity is a set of feelings of persons, by which they make a place meaningful and purposeful. In terms of attachment, this aspect of a sense of place addresses an environment's response in meeting the needs of individuals (Karimi et al. 2021, 61). Therefore, place belonging created based on the sense of place is beyond the awareness of settlement in a place. This sense leads to the relationship between person and place where individuals see themselves as a part of the place. Based on their experiences obtained from symbols, meanings, performances, and character, individuals shape roles for the place in their minds and place respects them (Steele 1981, 44). This sense creates required motivation for persons to stay in the environment (Maleki et al. 2014, 99). Some factors, such as residence time in a place, age, sex, education, settlement duration, physical, historical, and cultural properties of a place can highly influence the feelings and emotions of the residents living there (Bazi et al. 2014, 1).

2.4. Factors Forming a Sense of Belonging to Place

Individual Perceptual-Cognitive Factors: This dimension of belonging emphasizes the humans' emotions and feelings about their surrounding environments. Perception and recognition of place by a person is the prerequisite for creating a sense of belonging to a place (Foroozandeh and Motalebi 2011, 33).
Social Factors: social variables, including culture, symbols, and social signs, also play a significant role. According to this approach, the environment consists of common social information and symbols understood and encoded by individuals to interact with their environments (Siyavashpour et al. 2014, 6). Some researchers consider place attachment as a variable that depends on public participation in place, the employment rate in social networks, and cultural interactions (Marcus 1995, 116).
Environmental-Physical Factors: these factors divide the environment into two important factors of action

and physic based on the place-behavior theory in environmental psychology. These factors define the prevailing activities in an environment based on the general actions and interactions between humans and evaluate the physic along with form and elements organization variables as the most important factors that create a sense of belonging to a place. Physical elements create a sense of belonging through environmental distinction and linking the indoor and outdoor spaces. On the other hand, physical elements affect the creation of belonging through synergy and human needs provision (Javan Foroozandeh and Motalebi 2011, 33). In the opinion of Fritz Steele (1981), the most important factors affecting the perception and sense of place are the size of the place, degree of enclosure, contrast, scale, proportion, human scale, distance, texture, color, odor, sound, and visual variety. He also names some specifications, including identity, history, imagination and fantasy, mystery, pleasure, surprise, security, vitality, livability, and memory as factors that create a centralized link with the place (Fig. 3).

2.5. The Relationship between Private Life Area (Privacy) and Sense of Belonging

Individual and communal values influence the sense of place, and the sense of place influences the values and attitudes, particularly the individual and collective behaviors (Canter 1971, 17). Place belonging is a relationship between a person or group and place, which varies depending the spatial level, degree of specificity, and social or physical characteristics of the place. This relationship appears in emotions, cognition, and psychological behavioral procedures (Scannell and Gifford 2010). According to Salvesen, physical character, ownership, authenticity, residents, accommodations, nature, and social and private spaces are ingredients of place that create a sense of place (Salvesen 2002).
Buttle and Martinson found a reverse relation between community size and the rate of place attachment among its residents (Buttle and Martinson 1979). Therefore, the lower the privacy of space, the less sense of belonging to the place will be. Harris and colleagues found some antecedents indicating that residents who had access to privacy in their living place had a higher attachment to that place (Harris et al. 1995, 315). They concluded that those who live in group houses and are more satisfied with access to desired privacy achieve a higher sense of belonging. Therefore, it seems that people who can successfully regulate their considered privacy can improve their sense of belonging (Harris et al. 1996). Moreover, Harris et al. (1995) examined the relationship between privacy, a sense of belonging, and welfare. They found that those users who gave a higher score to their welfare and convenience in their living places have a higher level of place attachment

(Harris et al. 1995, 319). Moreover, Vinsel and colleagues introduce privacy as a basic element for achieving prosperity and comfort (Vinsel et al. 1980). Some researchers (e.g., Stokols and Shumaker 1982, 163) found a correlation between place attachment and well-being. McAndrew (1998) concluded that those residents who achieve higher place attachment have more rootedness in the place and less desire for change. These individuals experience more privacy in their living places and have higher control over their surrounding environments (McAndrew 1998, 411).
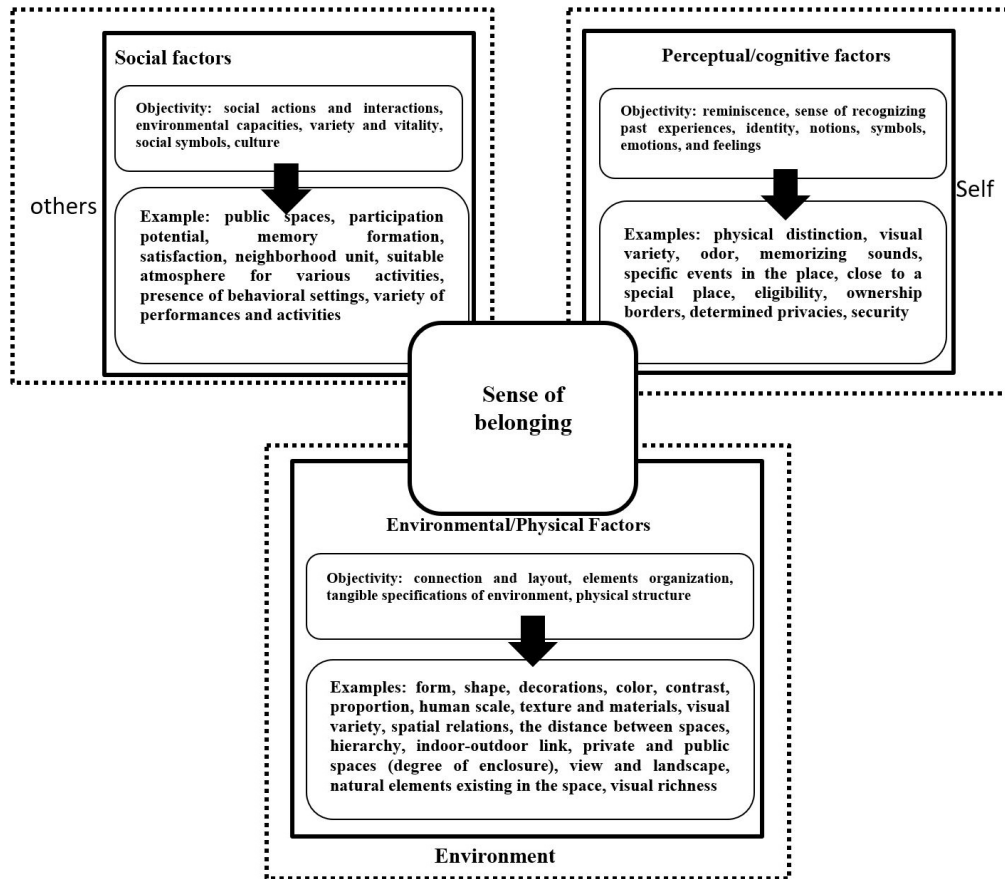
Social factors

Objectivity: social actions and interactions, environmental capacities, variety and vitality, social symbols, culture

Example: public spaces, participation potential, memory formation, satisfaction, neighborhood unit, suitable atmosphere for various activities, presence of behavioral settings, variety of performances and activities

others

Perceptual/cognitive factors

Objectivity: reminiscence, sense of recognizing past experiences, identity, notions, symbols, emotions, and feelings

Examples: physical distinction, visual variety, odor, memorizing sounds, specific events in the place, close to a special place, eligibility, ownership borders, determined privacies, security

Self

Sense of belonging

Environmental/Physical Factors

Objectivity: connection and layout, elements organization, tangible specifications of environment, physical structure

Examples: form, shape, decorations, color, contrast, proportion, human scale, texture and materials, visual variety, spatial relations, the distance between spaces, hierarchy, indoor-outdoor link, private and public spaces (degree of enclosure), view and landscape, natural elements existing in the space, visual richness

Environment

Fig. 3. Factors Forming a Sense of Belonging to the Place

3. INTRODUCTION TO STUDIED CASES

Dormitories of Yazd University were selected as case studies because they had similar sites with different architectures. With a built-up area of 5600m, Shaghayegh Dormitory has a site structure including 28 rooms and two floors. Each suite has three rooms: one bedroom, one sitting room, and one kitchen. Two restrooms and a bath have been considered for each suite. This dormitory is similar to Maryam Dormitory. The Two-story Gol-Mohammadi Dormitory has a 10000m2 build area and 700-member capacity. Each suite has one sitting room and all three rooms in the suite are separated from the sitting room with a stairway (suites are mezzanine where three rooms are on the upper side and two rooms are on the lower side). The restrooms and kitchen are located in the main corridor. The building of both dormitories is designed on two sides of the wide central courtyard. The sitting room of suits is used as a space for spreading clothes because this space is not furnished. Gol-Mohammadi and Yas dormitories are identical in architecture. Yas Dormitory with a 525-member capacity was constructed in 1994. Gol-Mohammadi and Shaghayegh dormitories were introduced as the top dormitories of Iran in 2005. Reyhaneh, Niloofar, and Narges Dormitories have similar architecture and are designed as a corridor on each floor of four floors. The rooms are located on lateral sides, and the kitchen, restrooms, and stairway are at the central part. Laleh Dormitory also has a suite-like structure, while restrooms and baths are located in the corridor. Nastaran Dormitory also has a suite-like structure with many rooms inside one suite. The Courtyard of this dormitory is smaller than others.

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Fig. 4. Maryam Dormitory of Yazd University

Fig. 5. Niloofar Dormitory of Yazd University

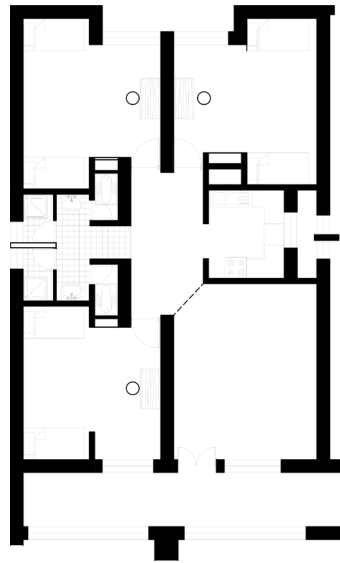**Fig. 6. From the Left: the Corridor between Suites and one Suite of Gol-Mohammadi Suite**

Fig. 7. Plan of a Suite located in Shaghayegh Dormitory

Fig. 8. Area o Yas Dormitory

Fig. 9. Reyhaneh Dormitory

Fig. 10. Nastaran Dormitory
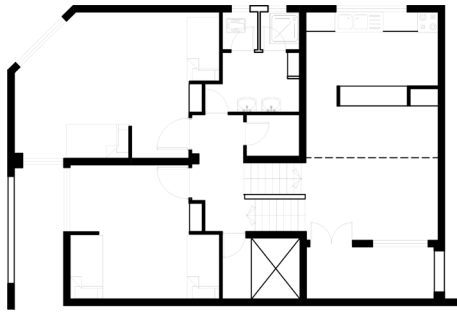

Fig. 11. Shaghayegh Dormitory

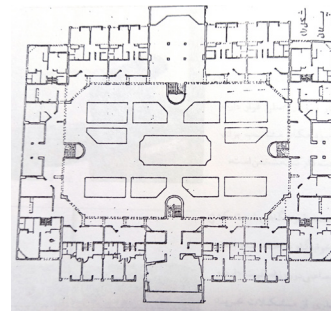**Fig. 12. Plan of a Suite located in Yas Dormitory**

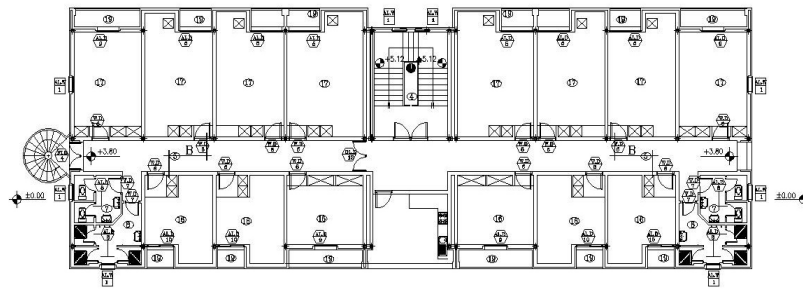**Fig. 13. The General Plan of the Shaghayegh Dormitory**

Fig. 14. General Plan of Niloofar, Narges and Reyhaneh Dormitories

4. METHOD

This was a descriptive-correlational study, which was conducted based on the case-study technique. A statistical society comprised female students living in dormitories at Yazd University. Sample size (n=140) was calculated based on the Cochrane formula and results obtained by Serajzadeh and Habibpour by consideration of Z=1.96, p=0.1, and d=0.05. the subjects were selected through random sampling. The inclusion criteria were students who signed the consent letter and those who were not transferred, students. Data collection was done by using three questionnaires: "demographic profile," "privacy," and "sense of belonging." The demographic profile consisted of age, education discipline, marital status, education level, education duration at the university, settlement duration in the dormitory, the permanent residence of the student, and the number of students living in the room. Some short answer questions were designed to ask students about their preferences in the field of environment and architecture of dormitories, including size and capacity of rooms, type of bed, and

so forth. A 12-item researcher-made questionnaire was used to measure privacy. Three experts examined and confirmed the validity of this questionnaire, and its reliability of Cronbach's alpha equaled 0.763. the questionnaire was scored on a 4-point Likert scale from 1 to 4 (very little, little, average, and high). Therefore, the score range of it varied between 12 and 48. Scores less than 20 indicate a poor situation, 20-35 showed an average situation and scores greater than 35 indicated a good situation.

Sense of belonging to place was measured based on a 10-item researcher-made questionnaire, which its reliability equaled 0.832 based on Cronbach's alpha. The answers were scored on a 5-point Likert scale (strongly agree (1), agree (2), no idea (3), disagree (4), strongly disagree (5)). The lowest and highest scores of belonging equaled 10 and 50, respectively. The score range was assigned to three groups: low (<19), medium (19-40), and high (40-50) sense of belonging. Moreover, items about features of an ideal room were defined based on five factors introduced by Georgiou, and then privacy provision solutions

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adopted by each student were determined. Finally, some items were defined to assess the sense of belonging to place in students.

After collecting data and reviewing requirements, data analysis was done through SPSS22 software. If data are normal, parametric tests of ANOVA and T-test are used. Otherwise, non-parametric tests and significance test of the correlation coefficient was done. This process was done at a confidence level of 95%.

Questionnaire replication was examined by comparing two scores of the dimensions twice within two-week intervals (test-retest) by 21 students living in the dormitory who were not the subjects of this study. The intra-cluster correlation coefficient of all constructs of the questionnaire equaled greater than 0.75, which indicated their ideal reliabilities.

5. RESULTS

To achieve reliable results, 140 questionnaires were gathered and analyzed. Of 140 respondents, 87.9% were single and 12.1% were married. In terms of the education level of respondents, 62.9% were BA degree students, 35.7% were Master's degree students, and 1.4% were Ph.D. students. Moreover, 60.5% were reluctant to stay and live in the dormitory and 72.5% talked about their good memories and experiences in the dormitory.

Table 2. Mean, Min, Max, and SD Values of Quantitative Variables

Variable	Min	Max	Mean	SD
Education duration at University (year)	1	9	2.71	1.3
Settlement duration in the Dormitory	1	6	2.44	1.45
Number of Students Living in Your Room	2	8	4.79	1.14
The Ideal Capacity of Your Room	1	8	3.33	1.06
Privacy Score	15	43	30.39	5.77
Sense of belonging Score	16	48	34.94	7.28

According to analysis results, the majority of students are willing to own the low bed located in indentations. Moreover, among the reading room, room, bed, etc., students preferred the reading room for studying, indicating a lack of suitable privacy provision for reading in the room. In terms of students' preferences for the location of their rooms (access to improper hierarchy, being far away from the restroom and kitchen due to bad odor, silence, no direct view of others, closeness to stairway and kitchen), most of the students prefer suitable hierarchy and silence in their rooms. Among determinants of privacy in the room, students highlighted the behavioral factors, which implies that privacy regulation factors, such as proper furniture, use of surfaces, edges, etc. have not been considered in the design of rooms causing disgust with the dormitory's atmosphere affecting the sense of belonging in students. In addition, the majority of students pointed to friends and gatherings in terms of the component of missing friends, room, bed, area of the dormitory, and sense of autonomy in the dormitory.

Table 3. Descriptive Statistics of Privacy Questions

Row	Questions	Very Little		Little		Somewhat		High	
		N	%	N	%	N	%	N	%
1	To what extent your room is silent allowing you to study and rest?	19	13.6	29	20.7	76	54.3	16	11.4
2	How much suitable space do you have in your room for study? (Having your desk)	81	57.9	29	20.7	22	15.7	8	5.7
3	To what extent you can study in your room when others are resting?	32	22.9	51	36.4	48	34.3	9	6.4
4	To what extent do you have proper conditions for rest in your room?	9	6.4	22	15.7	78	55.7	31	22.1
5	To what extent do you have privacy away from others' views?	46	32.9	35	25	34	24.3	25	17.9

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Row	Questions	Very Little		Little		Somewhat		High	
		N	%	N	%	N	%	N	%
6	How much does the noise of people walking in the corridors and kitchen disturb your privacy?	5	3.6	29	20.7	39	27.9	67	47.9
7	To what extent do you have open or semi-open private space in your room?	62	44.3	47	33.6	26	18.6	5	3.6
8	To what extent, the room has been defined for your stuff? (Others know where you put your stuff)	10	7.1	16	11.4	58	41.4	56	40
9	To what extent, you can choose to have a social relationship in your room?	16	11.4	28	20	67	47.9	29	20.7
10	How much do you feel safe in your room?	9	6.4	19	13.6	61	43.6	51	36.4
11	How much do you have privacy in your room?	26	18.6	39	27.9	59	42.1	16	11.4
12	How much do you feel you are at home here (dormitory)	50	35.7	37	26.4	41	29.3	12	8.6

Table 4. Descriptive Statistics of Sense of belonging Questionnaire

Row	Questions	Strongly Disagree		Disagree		No Idea		Agree		Strongly Agree	
		N	%	N	%	N	%	N	%	N	%
1	I miss the dormitory when I leave it	17	12.1	23	16.4	25	17.9	44	31.4	31	22.1
2	I miss my roommates when I am not in the dormitory	4	2.9	8	5.7	18	12.9	54	38.6	56	40
3	I love to live in the dormitory	15	10.7	13	9.3	25	19.7	52	37.1	35	25
4	I know all places in the dormitory	1	0.7	10	7.1	8	5.7	71	50.7	50	35.7
5	I have many important memories and experiences in the dormitory	0	0	9	6.4	20	14.3	57	40.7	54	38.6
6	I prefer living in the dormitory	29	20.7	26	18.6	27	19.3	43	30.7	15	10.7
7	I choose the same place if I am supposed to change my room	14	10	28	20	32	22.9	48	34.3	18	12.9
8	I see and talk to my roommates, neighbors, or friends in the dormitory	3	2.1	7	5	9	6.4	69	49.3	52	37.1
9	The façade of the buildings and their plan and harmony in the dormitory are attractive to me	28	20	20	14.3	31	22.1	44	31.4	17	12.1
10	The appearance of the room, dormitory, kitchen, and corridors in the dormitory are beautiful	47	33.6	27	19.3	36	25.7	19	13.6	11	7.9

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Table 5. Relation between Scores and Two-Way Qualitative Data

Variable		N	Privacy (Mean±SD)	Sense of belonging (Mean±SD)
Marital Status				
Single		123	30.41±5.91	35.07±7.45
Married		17	30.18±4.76	34.06±5.99
	p-value		0.876	0.449
Tendency to Stay in Dormitory				
Yes		85	32.83±4.74	38.2±5.68
No		55	26.47±5.26	29.29±6.373
	p-value		0.000	0.000

Table 5 examines the relationship between privacy and sense of belonging scores with two-way qualitative variables using the Mann–Whitney test due to non-normal scores. No significant correlation was found between mean scores and marital status (P-value>0.05), which means mean scores are not different between single and married students. A significant relationship exists between considered scores and the tendency to stay in the dormitory, and those who were willing to stay and live in a dormitory obtained higher scores.

Table 6. Spearman Correlation between Privacy Scores and Sense of belonging with Quantitative Variables

Variable	Education duration	Settlement duration in the Dormitory	Number of Students Living in the Room	Privacy	Sense of Belonging to the Place
Privacy	0.031	0.015	-0.128	-	0.599**
	0.716	0.861	0.132	-	0.000
Sense of Belonging	0.14	0.159	-0.219**	0.599**	-
	0.1	0.061	0.009	0.000	-

**Significance level of 0.01

A reverse statistical relationship was only seen between the score of belonging and the number of students living in the room (P-value>0.01); it means that a decrease in the number of students living in the room will increase the score of sense of belonging. Moreover, a direct and strong correlation was observed between privacy score and sense of belonging (P<0.01; r=0.599). However, no significant relationship was seen between other variables and privacy and sense of belonging scores (P-Value>0.05). In this relation, the following assessments were done for privacy and a sense of belonging in studied dormitories.

Table 7. Evaluating the Privacy and Belonging Components in Case Studies

		N	Mean	Std. Deviation	Min	Max	p-Value
Privacy	Nastaran	21	29.7143	6.16557	16.00	41.00	0.195
	Maryam	16	28.0625	6.39238	15.00	36.00	
	Gol-Mohammadi	25	32.6400	6.29735	22.00	41.00	
	Laleh	14	29.6429	5.75937	15.00	40.00	
	Narges	6	29.6667	3.88158	25.00	36.00	
	Reyhaneh	12	33.0000	2.89200	27.00	36.00	
	Yas	23	29.7391	4.65361	18.00	39.00	
	Shaghayegh	23	30.0870	6.37405	21.00	43.00	

		N	Mean	Std. Deviation	Min	Max	p-Value
Sense of Belonging	Nastaran	21	32.1429	7.55834	19.00	47.00	
	Maryam	16	31.7500	5.81378	23.00	40.00	
	Gol-Mohammadi	25	37.1200	7.24753	22.00	48.00	
	Laleh	14	37.2143	8.44146	18.00	46.00	0.05
	Narges	6	30.8333	8.37655	21.00	42.00	
	Reyhaneh	12	37.9167	5.94610	27.00	47.00	
	Yas	23	35.1739	6.78000	16.00	44.00	
	Shaghayegh	23	35.2609	6.90334	21.00	48.00	

Fig. 15. The Mean Score of Privacy in Studied Dormitories

Reyhaneh and Maryam's dormitories obtained the maximum and minimum privacy scores, respectively. This difference, however, is not significant because the p-value is greater than 0.05.

Fig. 16. The Mean Score of Belonging in Studied Dormitories

Reyhaneh and Narges dormitories obtained maximum and minimum belonging scores, respectively. This difference is significant due to the obtained p-value of 0.05. Moreover, the mean score of belonging was different in various dormitories.

Table 8. Evaluating the Privacy and Belonging Components in Different Types of Dormitories

		N	Mean	Std. Deviation	Min	Max	p-Value
Privacy	Suite	72	29.5694	6.10663	15.00	43.00	
	Corridor	20	31.2500	4.26584	20.00	36.00	0.228
	Semi-Suite	48	31.3	5.70368	18.00	41.00	
Sense of Belonging	Suite	72	33.9722	7.42848	18.00	48.00	
	Corridor	20	35.4500	7.19265	21.00	47.00	0.251
	Semi-Suite	48	36.1875	7.02172	16.00	48.00	

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According to the charts, the mean score of privacy and belonging is higher in semi-suites, while this difference is not significant (P-value>0.05). It means that the mean score of belonging and privacy does not show any difference based on the type of dormitory.
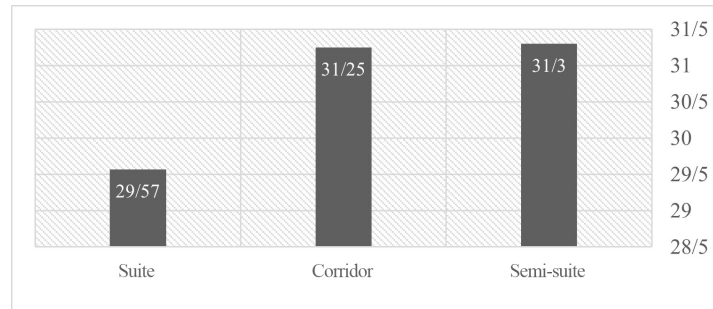

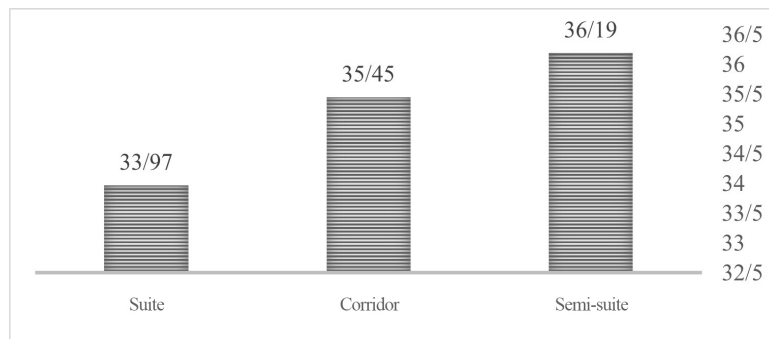**Fig. 17. The Mean Score of Privacy based on the Type of Dormitory**

Fig. 18. The Mean Score of Belonging to a Place, based on the Type of Dormitory

6. DISCUSSION AND CONCLUSION

According to results concerning the capacity of rooms, most students are willing to live in rooms that have a maximum capacity of 4 students due to higher privacy, wider spatial territory, and fewer crowd while not being alone or isolated in such rooms. As BA and Master's students gave different answers about room capacity, two different patterns can be used to design dormitories for these two academic groups. Moreover, the widened field of view, particularly in bedrooms and private areas has led to the view of the indoor space of bedrooms so that students who are walking in corridors can see this private space. This case has made students dissatisfied with the spatial layout of this plan. In terms of bed type, students preferred floor beds inside the indentations rather than double-deck beds.

As mentioned before, the term "dormitory" consists of an incomplete concept that is empty of qualities expected of student settlements. Instead, "student residence" is preferred because this term includes a more profound range and complete concept of settlement during student life. Realization of the complete concept of settlement in student residences requires paying attention to privacy and a sense of belonging to place; private living areas provide a space for privacy, thinking, and comfort.

The most important factors for the realization of privacy in student residences can be classified into the following categories: 1. controlling visual factors, 2. controlling audio or vocal factors, and 3. controlling accessibility. If the abovementioned factors are regulated and controlled, "privacy" and "private area" can be defined, and "interaction" can be regulated in student residences. In this case, the expected qualities will be actualized. In this case, accurate regulation and provision of a "reading and sleep area" can directly affect the satisfaction with the private area of student residence. If privacy and private area are provided in student residences, the field will be provided to achieve some goals, including personal autonomy provision, emotion alleviation, self-assessment possibility, and controlled communication with others for those who live in these residences.

Other results indicated the factors affecting the rate of "sense of belonging" to the environment of student residences, the most important of which include: 1. perceptual-cognitive factors (that are mainly influenced by architecture and residence environment), 2. social factors (that are mainly concerned in the relationship with roommates). In this case, proper physic and body, as well as architectural and environmental qualities can directly affect the

satisfaction with residence and subsequently the rate of belonging or attachment to the space of student residence. If the mentioned cases are provisioned, the emotional relationship between students and the residence place is improved and they become more attached to there.

The results obtained from the case study analysis indicated a direct relationship between the definition of "private areas" and regulation quality and their controllability in the student residence place with accessibility to a "sense of belonging" to the area. According to the findings, the following solutions are proposed to provide privacy and improve the sense of belonging to the place:

- Emotional combability of students with roommates: students must be free in choosing their roommates. This allows students to define and provide their privacies more easily and feel belonging in their rooms.

- Providing amenities: those students who have more amenities have fewer privacy needs, so feel more belonging to their facilities. If the furniture is changed (not using fixed furniture) individuals feel more belonging to their rooms.

- Proportionality between individuals who live in the room and the room area: If the number of residents is matched with the physical dimensions of the room, individuals have more control over their social interactions. In return, when the population rate of the room is not matched with its physical dimensions then interactions cannot be controlled well and the sense of belonging of individuals will be reduced subsequently.

- Creating spatial hierarchy and success-functional hierarchy in the design of residence and boundary of spaces: spatial and access hierarchy is an important step to determining territory and ensuring space confidentiality. If rooms are not separated from public space based on a suitable hierarchy, individuals cannot

control their visual, vocal, and olfactory interactions. In this case, individuals feel less belonging to the space that is more public.

- Separation of boundary and private-public territories: this case can be done by using environmental graphical techniques, such as an L-shaped layout, arrangement of beds in corners, and ceiling design.

- Design of pergolas (indentations): design of indentations in the room where two persons can sit and talk to each other. Moreover, indentations help students feel have privacy and more sense of belonging. Another solution is defining private areas and privacy by using stairways, curtains, and light, and partitioning the beds, which include shelves and lockers for students.

- Following the principle of plurality, while considering unity in the whole plan: the difference between specifications and functions of spaces, activities, and territories must be considered to realize this principle. If these subjects are ignored and spaces are designed with contrast, spatial chaos may occur. Therefore, caution must be taken in this case. Diverse spaces can be created by enlarging or shrinking the spaces. Moreover, height differences or changing openness can effectively create sequential or transition spaces. For instance, the sense of belonging to place, security, and satisfaction will be increased by shrinking the large public spaces to smaller areas (defining small intimate courtyards, pause points in open and closed passages, small and private platforms for students' hangouts among suites). Hence, the following influential changes are considered to create transition spaces: 1. scale of two spaces, 2. types of space, 3. enclosed space' temperature, 4. space-limiting elements, and 5. color.

If the mentioned factors are realized, privacy and territory of individuals are provisioned to create and improve the sense of belonging to student residence place.

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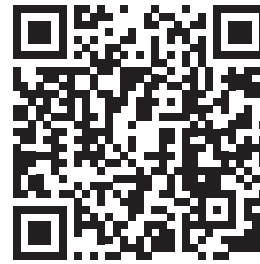
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