IOP Conference Series: Earth and Environmental Science

A comparative analysis of student housing security measures

A comparative analysis of student housing security measures

S Adisa[1] and F Simpeh [2]
[1]Department of Construction Management and Quantity Surveying, Cape Peninsula University of Technology, South Africa
[2]Department of Quantity Surveying and Construction Management, University of the Free State, South Africa

Abstract. Security lapses have been identified as a problem in most on-campus Student Housing Facilities (SHFs) in South Africa. Thus, this paper investigates the security measures provided in the SHFs of two South African universities with the aim of identifying areas where improvements are required. The study adopted both qualitative and quantitative survey approach. Qualitative data was collected from the university health, safety, and environment officers of both universities whilst the quantitative data was collected by means of questionnaire from the students. Descriptive (mean score) statistics was used to analyse the quantitative data whereas thematic analysis was used for the qualitative data. The study found that the security measures provided in the SHFs of University B were better than those provided in the SHFs of university A. Although university B had a better provision, some lapses were identified such as inadequate Closed-Circuit Television (CCTV) and absence of weapon detector. In addition to these two lapses identified in university B, university A had lapses in the provision of access control, security patrol, electronics coded locks on door, and security alarm in most of the residences. Thus, security lapses identified in both institutions were inadequate CCTV and absence of weapon detector. The study provides empirical information that can help the university health and safety officers and facility managers to improve the SHFs security measures.
Keywords: measures, security, student housing facility, universities

1. Introduction

The value of higher education goes beyond the individual, extending to the family, the community, the country, and the world at large [1]. In consequence, tertiary education brings positive changes to the social and economic development of any nation [2]. The inputs of higher learning institutions are comprised of human, facilities, financial and material resources. Human inputs consist of students, school administration and academic staff, while the facilities include buildings, roads and grounds, furniture and general infrastructure [3][4]. All of these inputs are transformed to produce the desired results [5]. According to Zotorvie [6], SHFs are now perceived as a fundamental component of university physical infrastructure. Infact, SHF has become a useful marketing tool of higher learning institutions across the world [7]. Moreover, SHFs add value to higher learning institutions [8]. Lubis and Fauzi [9] described the concept of SHFs in various ways such as hostel, halls of residences, boarding house, pavilion, accommodation, or student apartment. The configuration of rooms, size, and location of SHFs often depend on university and private investors' decisions. SHFs are usually situated on campus or off campus in a nearby residential environment. Regardless of the location, SHFs ought to guarantee the security of the residence. A safe and secured SHFs condition influences positive behavior among students, enhances safety and comfort, promotes performance and satisfaction, improves healthy living and stimulate academic intellectual development, encourages mutual interaction among students and makes them feel secured at their various residences [10][11][12].

Several studies on SHFs in the broader scope has been carried out globally and in South Africa. Some of the SHF studies carried out include [13][14][15][16][17]. However, studies which primarily examines the level of provision of SHF security measures in South African universities is quite lacking. Thus, this paper investigates the security measures provided in the SHFs of two South African universities with the aim of identifying areas where improvements are required.

2. Student housing facility security measures

Ensuring a safe SHF does add value to the university. Hassanain [13] opined that to attract and retain students, universities should endeavor to provide housing that are safe and secured for the students. Hassanain [13] further explain that, students perform better in their studies if they have safe, secure and comfortable living conditions at their residences. Free movement at night on both on and off campus residences without threat can assist student to have a sense of better experience and good relations with one another [18]. Thus, any gaps in the security of a SHF should be a concern to all the stakeholders. Kahari [19] indicated that security and safety requirements are lacking in many SHFs in SA universities. According to report on the ministerial committee for the review of the provision of student housing in South African universities, security is a major issue across South African universities [20]. The abandonment of security measures in the SHFs have exposed students to high risk resulting in an increase in injury, intimidation, attempted murder, threat, theft, and fatality rate increases [21][19][11]. South Africa tertiary institutions are characterised by exceptionally high mortality rate due to lack of security measures on campuses [22]. All these campus violence and criminal act calls for urgent attention in South african SHFs. With respect to the security measures required in the SHFs, [23][13], [21][11]24] identified the following close circuit television (CCTV), security guard on post, security alarm, access control with functional smart-card, weapon detector, fencing around the hostel, adequate lighting at night, security patrol around the hostel, emergency help line, notice board, written policy prohibiting vandalism, emergency protocol poster on the wall, security signs and security check point at the entrance of hostel. Lindegaard and Henriksen [23] emphasised that the provision of CCTV and security personnel at the entrance and around SHFs is critical. Similarly, Xaba [21] opined that campus environment should be thoroughly monitored with surveillance cameras.

3. Research Methodology

This paper set out to assess the level of provision of security measures in the SHFs of two South African universities. The two universities are presented as university A and university B, respectively. Data were collected by means of interview and questionnaire. The interview was conducted with the health, safety, and environment (SHE) officer in the case of university A and with both the SHE officer and fire coordinator in the case of university B. All interviews were tape recorded, transcribed, and sent back to interviewees for clarification. Moreover, a closed-ended questionnaire was structured and administered to students. Both quota and convenient sampling methods were used. Quota sampling method was adopted to allow the inclusion of all the on-campus SHFs from both universities. This became necessary to holistically explore security issues across all the residences. Respondents were provided with a total of 13 variables to rate the level of provision of those security measures using a five-point Likert scale, where 1 = 'Not provided', 2 = 'Poorly provided', 3 = 'Somewhat provided', 4 = 'Provided' and 5 = 'Well provided'. The respondents were also provided with the (Unsure option). A Mean Score (MS) value range was determined; 1 was subtracted from 5 which equals 4, after that, the 4 was divided by 5 equalling 0.8 which becomes the MS range. Consequently, the MS range for 'well provided' becomes $> 4.20 \leq 5.00$; 'provided' becomes $> 3.40 \leq 4.20$; 'somewhat provided' becomes $> 2.60 \leq 3.40$; 'poorly provided' becomes$> 1.80 \leq 2.60$; and 'not provided' becomes $> 1.00 \leq 1.80$. This approach was also adopted by [25]. A total of 460 questionnaires were administered to students living in the on-campus SHFs which directly belongs to university A and university B, respectively. 400 questionnaires were returned from both universities. However, 62 of the questionnaires were discarded because they were not well / fully completed. Thus, a total of 338 questionnaires were properly completed which equivalent to 169 questionnaires from each university. The questionnaires were delivered to students who had stayed in the residence for, at least, on year. This was done to ensure that respondents had a better understanding of safety issues at their various residences. The quantitative data was analysed using Statistical Package for the Social Sciences (SPSSv25) with the use of descriptive statistics whilst the qualitative data was thematically analysed. The gap analysis was used to determine the mean score differences in the level of provision of the security measures between the two universities.

4. Findings

Firstly, the interviews are presented, followed by the quantitative data and finally the combined analysis.

4.1. Interviews

4.1.1. Interview with SHE officer of university A

In terms of security measures in the residence, the safety officer pointed out that there are CCTV, but not in all residences. This implies that there were lapses in the provision of CCTV. The officer further explained that, most of the undergraduate SHFs have biometric system, however, not all the biometric systems were working. Furthermore, the interview revealed that there were security guards who are expected to be on duty post and maintain 24 hours on duty, but no weapon detectors were provided at the entrance of the SHFs. In terms of written policy prohibiting vandalism in the SHFs, the safety officer clarified that there are rule books for the students which hints on that, however, these rules were not pasted on the notice boards. Regarding electronic locks on the hostel doors, she stated, '*this can only be found at the postgraduate residence at the moment; however, students are expected to use padlocks.'* She explained that campus requires adequate lighting at night, especially the immediate surroundings of the SHFs. Lastly, the officer commented on the fencing around the SHFs. She stated that there is no specific fencing in all the SHFs, though there is a major fence that runs along the campus boundary. She pointed that though the main entrance gates are controlled, the exit at the rear side of the campus does not have CCTV nor security guards to monitor all times.

4.1.2. Interview with SHE officer and Fire coordinator of university B

The safety officer stated that security guards were present at the residences. In terms of CCTV in the SHFs, the fire coordinator indicated that the university have a lot of them in the strategic places on campus and is monitored by campus protection. He further clarified that, the flow of the residences is being monitored, however, improvement is needed in some crime areas. The safety officer further mentioned, '*the CCTV cameras provided are not night vision…'*. Therefore, it is evident that the university need to improve on the provision of CCTV. With regards to security check point at the entrance of SHFs and patrols, the respondents pointed out that such provisions were made and further pointed out that electronic coded locks on the door were provided in/at only three of the residences. In terms of lighting at night in/around the SHFs, the safety officers indicated that it looks fine especially inside the residences. The security officer stated that weapon detector at security check point at the residences is lacking. The safety officers further clarified that written policy prohibiting vandalism was provided in the form of rules and regulations which governs the residents/students. He explained that such policy includes no smoking and no drinking of alcohol in the SHFs.

4.2. Questionnaire survey

4.2.1. Level of provision of security measures at university A

The mean scores **(**MSs**)** of responses in Table 1 indicates that lighting at night in/around the SHFs was ranked first as the most provided security measure with MS (4.02), security guard on post was ranked second with MS (3.61), fencing around the hostel was ranked third with MS (3.07). Whereas, closed-circuit television (CCTV) for monitoring was ranked as the most lacking (not provided) security measure in the SHFs with MS as low as (1.24). The findings further reveal that none of the measures was rated as 'well provided'. Lighting at night in/around the SHFs and security guards on post were the only security measures that fell within 'provided'. Security signs for warning, written policy prohibiting vandalism, notice board displaying security policies and security patrol around the SHFs were the security measures found to be 'poorly provided'. The MS of 1.24 obtained CCTV shows that participants perceived it as 'not provided'. Other security measures rated as 'not provided' were access control with functional smart-card, security alarms, weapon detector and electronic coded locks on the doors at the hostel. In fact, more than 60% of the respondents rated these measures as 'not provided' (Refer to table 1). It can be deduced from the findings that quite a number of the security measures are 'poorly provided'

or 'not provided' in the SHFs. This could be a high risk to the students residing in the on-campus SHFs. The interview conducted established the lack of and/or poor provision of many of these security measures. For example, the interview with officer revealed that weapon detectors were not provided while CCTV was not provided in the majority of the SHFs.

Table 1. Level of provision of security measures at university A

Security measures	Response (%)						Mean Score	Rank
	Unsure	Not provided……..……Well provided						
		1	2	3	4	5		
Lighting at night in/around the hostel	0	1.8	13.6	8.9	32.0	43.8	4.02	1
Security guard on post	0	1.2	17.2	20.1	42.0	19.5	3.61	2
Fencing around the hostel	1.2	29.0	7.1	11.8	30.2	20.7	3.07	3
Security checkpoints	2.4	11.2	30.2	16.6	26.6	13.0	3.00	4
Security signs for warning	5.9	32.5	18.3	16.6	11.8	14.8	2.55	5
Written policy prohibiting vandalism	13.6	34.3	11.2	15.4	17.2	8.3	2.47	6
Notice board displaying security policies	8.9	45.6	17.2	13.6	8.3	6.5	2.04	7
Security patrol around the hostel	3.6	46.2	31.4	11.2	6.5	1.2	1.80	8
Access control with functional smart card	2.4	60.4	17.2	10.7	7.7	1.8	1.70	9
Security alarm	11.8	62.7	10.7	5.9	6.5	2.4	1.58	10
Electronic coded locks on the doors	0.6	74.6	10.7	4.7	3.6	5.9	1.54	11
Weapon detector at security checkpoint	4.7	80.5	7.1	5.9	1.8	0	1.25	12
CCTV for monitoring	4.1	77.5	15.4	1.8	0	1.2	1.24	13

4.2.2. Level of provision of security measures at university B

It is evident from Table 2 that security guard on post was ranked first, followed by lighting at night in/around the hostel, security check points at the entrance of the SHFs and fencing around the hostel. The MSs obtained indicated that the aforementioned security measures were 'well provided' in the SHFs. The findings further reveals that access control with functional smart-card (4.15), security patrol around the hostel (4.12), security alarm to sensitise in case of emergency (3.98), security signs for warning (3.81), electronic coded locks on the doors at the hostel (3.63), and written policy prohibiting vandalism (3.60) were security measures that respondents rated as 'provided' in the SHFs. The security measure where a notable number of responses fell within poorly provided was CCTV (2.12), whereas, respondents rated weapon detector (1.12) as the most lacking security measure in the SHFs. The interview conducted also established the lack of weapon detector and inadequate CCTV in the SHFs.

Table 2. Level of provision of security measures at university B

Security measures	Response (%)						Mean Score	Rank
	Unsure	Not provided……..……Well provided						
		1	2	3	4	5		
Security guard on post	0	0	1.8	4.7	21.9	71.6	4.63	1
Lighting at night in/around the hostel	0	0.6	1.2	7.1	33.7	57.4	4.46	2
Security checkpoints	0	1.2	3.6	11.2	33.7	50.3	4.28	3
Fencing around the hostel	0.6	6.5	0	11.8	29.6	51.5	4.20	4
Access control with functional smart card	1.8	4.7	1.2	5.3	49.7	37.3	4.15	5
Security patrol around the hostel	3.6	0.6	3.0	21.9	29.6	41.4	4.12	6
Security alarm	5.3	5.3	7.1	13.6	26.0	42.6	3.98	7
Security signs	2.4	5.3	8.3	20.1	29.0	34.9	3.81	8
Electronic coded locks on the doors	1.8	24.3	4.7	9.5	3.6	56.2	3.63	9
Written policy prohibiting vandalism	5.3	5.9	4.7	33.1	27.8	23.1	3.60	10
Notice board displaying security policies	13.0	9.5	8.3	17.8	44.4	7.1	3.36	11
CCTV for monitoring	10.1	28.4	42.0	3.0	13.0	3.6	2.12	12
Weapon detector at security checkpoint	8.9	80.5	4.1	3.6	2.4	0.6	1.22	13

4.3 Compared analysis and discussion

The MSs of all the individual measures are compared after which the average MSs are compared. Table 3 presents the MS obtained for each measure and the gap that exist between them. It is evident from Table 3 that there are differences in the MSs between the two universities. Responses from university B reveals a better provision of security measures than those from university A. It is evident that only one measure (weapon detector) was perceived as 'not provided' in university B, whilst as many as 5 measures (i.e. access control, security alarm, electronic coded locks, weapon detector and CCTV for monitoring) were rated as 'not provided' in university A. Additionally whilst only one measure (CCTV) was perceived as 'poorly provided' in university B, a total of 4 measures (i.e. security signs for warning, written policy prohibiting vandalism, notice board displaying security policies and security patrol around the SHFs) were rated as 'poorly provided' in university A. Moreover, whilst 4 measures were rated as 'well provided' in university B, none of the measures in university A was rated as 'well provide'. In fact, only two measures were rated as 'provided' in university A. The average shows that university B student housing had a far better security measure than those of university A. The interviews conducted also suggest that university B had a better provision of security measures than University A. Although university B had a better provision of security measures than University A, the interview revealed specific lapses in university B such as lack of weapon detector and inadequate provision of CCTV. University A also had such lapses. However, few extra concerns for university A include security patrol, absence of access control with functional smart card, electronics coded locks on door, and security alarm. Thus, the issues of concern across both universities are CCTV and lack of weapon detector. The importance of effective monitoring of campus facilities was underscored by [21][23]. Other studies do highlight such challenges in South African SHFs. Kahari [19] indicated that security and safety requirements are lacking in many SHFs in SA universities. The report on the ministerial committee for the review of the provision of student housing in South African universities, also identified security as a major issue across South African universities [20]. These lapses exposes students to high risk resulting in an increase in injury, intimidation, attempted murder, threat, and theft [21][19][11]. Thus, it becomes paramount that the university management put in place measures to mitigate these lapses.

Table 3. Level of provision of security measures at university A and B

Level of provision	**University A MS**	**Ranking**	**University B MS**	**Ranking**	**Gap**
Lighting at night	4.02	1	4.46	2	0.44
Security guard on post	3.61	2	4.63	1	1.02
Fencing around the SHF	3.07	3	4.20	4	1.13
Security check points	3.00	4	4.28	3	1.28
Security signs for warning	2.55	5	3.81	8	1.26
Written policy prohibiting vandalism	2.47	6	3.60	10	1.13
Notice board	2.04	7	3.36	11	1.32
Security patrol in the SHF	1.80	8	4.12	6	2.32
Access control	1.70	9	4.15	5	2.45
Security alarm	1.58	10	3.98	7	2.40
Electronic coded locks	1.54	11	3.68	9	2.14
Weapon detector	1.25	12	1.22	13	0.03
CCTV for monitoring	1.24	13	2.12	12	0.88
	2.29		3.66		1.37

5. Conclusion

On-campus SHFs promote the living and learning experience and enhances students' interactions and satisfaction. The security and safety of students should be prioritised in such facilities because the provision of adequate security measures in the on-campus SHFs are essential. The findings revealed that some security measures are provided across both universities whilst others are not. Security measures including lighting at night in/around the hostel and security guard on post were perceived as "provided" by the majority of the respondents across both universities. The findings also revealed that there are lapses across both universities. Security measures such as weapon detector at security check point and

CCTV are the main lapses across both universities. Comparatively university B had a better security systems at the SHFs. It is important that whilst priority is giving to the learning and living on campus, security and safety of students from infrastructural point of view is not compromised as effective learning and peaceful living can only take place in a safe and secured environment. This study contributes to the body of knowledge in SHF security measures. It is recommended that SHE officers, facility managers, and university maintenance departments ensure a regular security inspection of SHFs so that lapses that may result to safety risk could be identified and rectified timeously. Only two universities were used in this study. Therefore, the findings of the research may not be applied to other universities. A study that expands the number of participating universities is recommended.

6. References

[1] Simpeh F 2018 *Prioritisation of spaces and services in on-campus student housing facilities in southern Ghana universities* (PhD Thesis, Nelson Mandela University, South Africa)
[2] Entwistle N and Tait H 1990 Approaches to learning, evaluations of teaching, and preferences for contrasting academic environments *Higher education* **19** p 169-94
[3] Dufur M J, Parcel T L and Troutman K P 2013 Does capital at home matter more than capital at school? Social capital effects on academic achievement. *Research in Social Stratification and Mobility* **31** p 1–21
[4] Cole L B 2014 The teaching green school building: a framework for linking architecture and environmental education *Environmental Education Research* 20 **p** 836–57
[5] Morina A and Morgado B 2018 University surroundings and infrastructures that are accessible and inclusive for all: listening to students with disabilities *Journal of Further and Higher Education* **42** 13-23
[6] Zotorvie J S T 2017 Students' accommodation and academic aerformance: the case of Ho Technical University, Ghana *European Scientific Journal* **13** p 290.
[7] Abisuga O A, Wang C C and Sunindijo R Y 2020 A holistic framework with user-centred facilities performance attributes for evaluating higher education buildings *Facilities* **38** p 132-60.
[8] Price I, Matzdorf F, Smith L and Agahi H 2003 The impact of facilities on student choice of university *Facilities* **21** p 212–22.
[9] Lubis M, Fauzi R, Lubis A R and Fauzi R 2018 A case study of universities dormitory residence management system in Indonesia *6th Int. Conf. on Cyber and IT Service Mgt* p 1–6
[10] Adewunmi Y, Omirin M, Famuyiwa F and Farinloye O 2011 Post-occupancy evaluation of postgraduate hostel facilities *Facilities* **29** p 149–68
[11] Rodriguez L, Kramer S and Sherriff B 2013 Investigating risk and protective factors to mainstream safety and peace at the University of South Africa *African Safety Promotion: A Journal of Injury and Violence Prevention* **11** p 39-60
[12] Oke A E, Aigbavboa C O and Raphiri M M 2017 Students' satisfaction with hostel accommodations in higher education institutions *Journal of Engineering, Design and Technology* **15** p 652–66
[13] Hassanain M A 2008 On the performance evaluation of sustainable student housing facilities *Journal of Facilities Management* **6** p 212-25
[14] Toyin Sawyerr P and Yusof NA 2013 Student satisfaction with hostel facilities in Nigerian polytechnics *Journal of Facilities Management* **11** 306–22
[15] Nimako S G and Bondinuba F K 2013 Relative Importance of Student Accommodation Quality in Higher Education. *Current Research Journal of Social Sciences* **5** p134–42
[16] Sanni-Anibire M O and Hassanain M A 2016 Quality assessment of student housing facilities through post-occupancy evaluation *Architectural Engineering and Design Management* **12** p 367–80
[17] Simpeh F and Akinlolu M 2018 Importance level of on-campus student housing facility spaces: perception of postgraduate students. In Emuze F (Eds) *Proc. 10th Construction Industry Development Board (cidb) Postgraduate Conf.* P 181–90
[18] Mott M S, Robinson D H, Walden A, Burnette J and Rutherford A S 2012 Illuminating the effects of dynamic lighting on student learning Sage Open **2** p 1–9

[19] Kahari I 2010 *An exploratory study of first year residence students' perceptions regarding safety and security at the University of Cape Town* (Doctoral dissertation, University of Cape Town)
[20] Department of Higher Education and Training 2011 *Report on the ministerial committee for the review of the provision of student housing at south African universities* Department of Higher Education and Training
[21] Xaba M 2006 An investigation into the basic safety and security status of schools' physical environments *South African Journal of Education* **26** p 565–80
[22] Seedat M, Van Niekerk A, Jewkes R, Suffla S and Ratele K 2009 Violence and injuries in South Africa: prioritising an agenda for prevention *The Lancet*, **374** p 1011–22
[23] Lindegaard M R and Henriksen A 2005 Strategies of safety: when threats of violence become everyday life among South African adolescents *Medische Antropologie* **17** p 41–60
[24] Atkin B and Brooks A 2015 *Total facility management* 4th Edi. (John Wiley & Son, Ltd)
[25] Simpeh F and Akinlolu M 2019 Importance level of post graduate student housing facility services: perceptions of students *CIB World Building Congress* pp.1744-55