

A comparative analysis of the provision of student housing safety measures

Student
housing safety
measures

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Fredrick Simpeh

*Department of Quantity Surveying and Construction Management,
University of the Free State, Bloemfontein, South Africa, and*

Mariam Akinlolu

*Department of Construction Management and Quantity Surveying,
Mangosuthu University of Technology, Durban, South Africa*

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Abstract

Purpose – Security, safety, environment and health have become an integral part of facility management (FM). Therefore, FM departments within organisations are required to put measures in place to safeguard facility users. This paper thus aims to investigate and compare the safety and security measures that are provided in the student housing of two universities in South Africa.

Design/methodology/approach – A mixed method approach was adopted; interview was used to collect qualitative data, whereas a questionnaire was used as an instrument to collect quantitative data. Content analysis was used to analyse the qualitative data, whereas both descriptive and inferential statistics were used to analyse the quantitative data.

Findings – It became evident that university B had a better provision of safety and security measures in the student housing than university A. The study also found that both universities had some lapses in the safety and security measures provided in the student housing. Measures that were lacking in both universities were weapon detector, closed-circuit television (CCTV), water sprinkler system, burglar bars on the doors, lift for disabled students, disabled toilet facility, traffic light, tags for vehicles, first aid box, accident book and medically trained personnel.

Research limitations/implications – Data were collected from only two universities, making it difficult to generalise the findings of the research. For a broader perspective, a study that expands the number of participating universities is recommended.

Practical implications – The facility management and safety department in the universities can use the recommendations to improve on the safety and security measures required in the student housing. Moreover, the recommendations can contribute to the development of policy frameworks for student housing safety.

Originality/value – There is a paucity of studies on student housing safety/security worldwide, and South Africa in particular. With this study, the authors contribute to the body of knowledge in this area of research.

Keywords Security, Safety, Provision, Measures, Student housing

Paper type Research paper

Introduction

Facility management (FM) and its role have evolved over the years (Tucker and Masuri, 2016). Health, safety, security, and environment (HSSE) has become an essential part of FM due to the large body of legislation developed for the workplace, (Atkin and Brooks, 2015). Similarly, Hauptfleisch (2018) stated that safety, health and environment are now regarded as crucial knowledge areas in FM. In fact, “human factors” (i.e. health, security and environmental safety) is one of the core competencies of FM. Consequently, facility



managers need to ensure that facilities are managed to promote the safety of all facility users. The need for an effective FM system is crucial in all institutions, including universities. This is because facilities form a substantial part of a university's resources. Moreover, facilities create a suitable environment that promotes the teaching and learning required in an academic environment (Abdullahi and Yusoff, 2018). As a result, facilities greatly influence the students and staff in an academic environment (Price *et al.*, 2003). In the university set-up, several facilities, including student housing, play an essential support role in the provision of quality education (Simeph and Shakantu, 2019).

The importance of student housing cannot be overemphasised. Student housing promotes unity and helps students to develop and maintain a vibrant student culture (Addai, 2013). The set-up of student housing enhances the integration of students, makes students see studying as their main occupation and provides a community setting for the students (Department of Higher Education and Training, 2011). It is for this reason that health, safety, security and environment-related issues need to be accorded a high priority in the management of student housing. In fact, studies reveal that students place high importance on the safety and security of their student housing (Nimako and Bondinuba, 2013; Simeph and Shakantu, 2019; Simeph and Shakantu, 2020).

Notwithstanding, the study of Simeph and Akinlolu (2020) revealed that research on student housing safety and security is not giving the needed attention across the world. The situation in South Africa is even worse. The report of the Department of Higher Education and Training (2011) on the provision of student housing at South African universities reveals that safety and security are issues across South African universities. Besides, the study of Gopal and Niekerk (2018) indicates that the measures put in place to promote the safety of students residing in student housing are inadequate. Additionally, Lungani reported that South Africa tertiary institutions are becoming more dangerous due to safety and security gaps in student housing (Lungani, 2018). Therefore, a study that focusses on the provision of student housing safety and security measures is essential. Some authors have advocated for more studies on school/university infrastructure safety/security (Xaba, 2006; Rodriguez *et al.*, 2013; Gopal and Niekerk, 2018). It is on this premise that this paper investigates and compares the safety and security measures that are provided in the student housing of two universities in South Africa to identify lapses and offer recommendations that can help facilities and safety departments to improve on the safety of student housing.

Literature review

Student housing safety and security measures

Several measures are required to promote the safety of student housing. These would range from fire safety to security measures. Student housing is full of combustible materials such as books, furniture and clothing. Therefore, student housing is generally vulnerable to fire incidence (Hassanain, 2008a). Consequently, it becomes imperative to put measures in place to mitigate the risk and negative effect of fire outbreaks. Essential fire safety measures required to minimise/safeguard student housing from the risk of fire outbreak are fire extinguisher, fire hydrant, hose reel, sprinkler systems, foam inlet, fire stopping, rising main, reflux valve, escape door, escape route, heat/heat detectors, fire drills, fire assemble points and posters (Hassanain, 2008a; S.A. Government Notice, 2008; Atkin and Brooks, 2015). Apart from the fire safety measures, the condition of facilities contributes significantly to the safety of occupants. The building safety measures required in student housing include handrails on stairs, burglar bars on the windows and doors, adequate ventilation, tiles well placed on the floor (not lifting), walls well plastered (no cracks), lift for the disabled, toilet facility for the disabled, covered outdoor water mains, covered indoor

water mains and adequate lighting (Hassanain, 2008b; Rodriguez *et al.*, 2013; Atkin and Brooks, 2015). The lack of maintenance could affect the functionality of these measures and expose end users (i.e. students) to several risks. Consequently, it becomes paramount to ensure that these safety measures are always effectively maintained.

The surrounding environment also influences the safety of student housing. Nasar (2003) revealed that unsafe actions such as lack of safety road signs, motorists not yielding to pedestrians crossing the road, illegal parking, lack of drop-off/pick-up zone could result in accident on campuses. Therefore, it becomes imperative to ensure that measures necessary to safeguard students from traffic accidents are adequately provided on student housing roads. Measures such as adequate parking space, speed bumps, parking area for the disabled, pedestrian crossing, tags for vehicles, guards for vehicles, vehicle access control and traffic signs around student housing can help to promote traffic safety on/around student housing (Nasar, 2003; Xaba, 2006; Rodriguez *et al.*, 2013).

Environmental issues such as waste and noise could have an undesirable effect on student housing. For example, Whitehair *et al.* (2013) expressed that insufficient waste storage facilities could contribute to waste management problems, which could further have a negative effect on the health of students. Moreover, health issues and illness may demand first aid treatment before a referral is made. It is for this reason that Kincaid *et al.* (2005) advocate for a well-equipped first aid box and well-trained health and safety personnel on-site. Atkin and Brooks (2015) indicated that provision needs to be made for first aid box and an accident report book in each building. Other important health and environmental measures include on-campus clinic, medical personnel, waste disposal area, waste bin, lawn maintenance, barricades for any ongoing construction, keeping hostel free of stagnant water and prevention of noise pollution (Aibor and Olorunda, 2006; Atkin and Brooks, 2015; Dhai and Mahomed, 2018).

Apart from the safety of the building, several measures are required to promote the security of student housing. Necessary measures to boost the security of student housing include security alarms, access control, fencing, adequate lighting at night, security patrols, closed-circuit television (CCTV), weapon detectors, security guards on the post, emergency helpline, notice board, written policy prohibiting vandalism, emergency protocol poster, security signs and security checkpoints at student housing entrances (Hassanain, 2008b; Rodriguez *et al.*, 2013; Atkin and Brooks, 2015).

All these measures are essential and therefore need to be provided and managed to guarantee the safety and security of student housing. Notwithstanding, studies reveal lapses in the provision of safety measures in South African university student housing.

Infrastructure and student housing safety and security lapses

There are pieces of evidence of infrastructure security and safety lapses in South Africa in general and student housing specifically. For example, a survey carried out by Ngulube and Magazi (2013) on public libraries in KwaZulu-Natal province revealed that library buildings were not adequately equipped with safety measures and equipment to protect documents against disasters and theft. Ngulube and Magazi (2013) further revealed that most of the public libraries in the province did not have the right strategies to deal with theft. With regards to university infrastructure, Rodriguez *et al.* (2013) did a study entitled “risk and protective factors to mainstream safety and peace at the University of South Africa”. The study revealed few “traffic safety” lapses such as inconveniently located or insufficient pedestrian crossings and obscured and damaged parking bays. Security risk factors identified were lack of fencing enclosing open fields, absences of security guards in some areas, lack of smart access card and lack of visible security access doors. Rodriguez *et al.* (2013) further

identified risks including broken windows and missing ceiling panels, dimly lit or no lighting in parking areas and some stairwells, overgrown gardens, exposed light fixtures, some damaged fire alarms and smoke detectors, lack of clearly marked fire exit door signs and obstructed fire exit doors.

With specific reference to student housing, the studies of [Department of Higher Education and Training \(2011\)](#), [Gopal and Niekerk \(2018\)](#), [Adisa *et al.* \(2019\)](#) reveal lapses in the provision of the measures required to promote the safety of students residing in student housing. In 2011, the Department of Higher Education and Training conducted a review of the provision of student housing in South African universities; the report of the evaluation revealed that security and safety are major issues across South African university student accommodation ([Department of Higher Education and Training, 2011](#)). The report revealed that many residences had poor access control, and some residences did not even have a security guard at the entrance. The report further revealed there were several student housing-related protest actions; the protest action in 7 out of 15 universities was due to poor maintenance/facilities. [Adisa *et al.* \(2019\)](#) found that water sprinkler system, CCTV, weapon detector and smoke extractor were not provided, whereas measures including fire extinguisher, fire assembly point, access control and fire alarm were poorly provided in the student housing of a university in the Western Cape province. Poor access control, poor security systems, inadequate CCTV and lack of visible security guards at residences were the significant lapses identified by [Gopal and Niekerk \(2018\)](#). These lapses, if not rectified, could lead to severe consequences ranging from physical abuse and assault to death.

Research methodology

The study investigated and compared the safety measures that are provided in the student housing of two universities in South Africa. For reasons of confidentiality, the names of the institutions involved are not revealed. The study adopted a mixed method approach; questionnaire was used to collect quantitative data from students, whereas qualitative data was collected from the safety, health and environment (SHE) officers/fire coordinator by means of interviews.

Sampling helps to extract acceptable respondents to represent the larger population of whom data is collected ([Welman *et al.*, 2005](#)). Two different sampling techniques – quota and convenient – were adopted. All the on-campus student housing owned by both universities were included in this study. At the time of the study, university A had nine on-campus student housing facilities, whereas University B had eight on-campus student housing facilities. The combined capacity of all the student housing in each university was approximately 2,000. [Singh and Masuku \(2014\)](#) suggest that for a total population of about 2000, at 95% confidence level with a 7% confidence interval (margin error), there should be 185 respondents. Twelve per cent was set as the quota for each student housing. The quota sampling allowed for equity of sample representation from all the student housing on the premises of the university and by so doing averted selection bias. After the quota was determined, the questionnaires were distributed to students using convenient sampling technique. A total of 450 questionnaires (i.e. 230 for university A and 220 for university B) was administered to students; however, 338 questionnaires (169 from each university) were appropriately completed and thus used for the analysis.

The questions for the questionnaire survey were captured on a five-point Likert scale where 1 = not provided 2 = poorly provided, 3 = somewhat provided, 4 = provided and 5 = well provided. An “unsure” option was also provided. A mean score (MS) value range was determined to promote a consistent classification and interpretations; 1 was subtracted from 5, which equals 4; after that, the four was divided by 5, equalling 0.8, which becomes

the MS range. Consequently, the MS range for “not provided” becomes $> 1.00 \leq 1.80$; “poorly provided” becomes $> 1.80 \leq 2.60$; “somewhat provided” becomes $> 2.60 \leq 3.40$; “provided” becomes $> 3.40 \leq 4.20$; and “well provided” becomes $> 4.20 \leq 5.00$. With regards to the interview, the SHE officer of university A was interviewed, whereas in the case of university B, both the SHE Officer and the Fire Coordinator were interviewed.

To determine the normality of the data gathered, the Kolmogorov–Smirnov Z and Shapiro–Wilk test were adopted. The Shapiro–Wilk and Kolmogorov–Smirnov tests make comparisons between the scores obtained from a sample to normally distributed score sets with the same mean and standard deviation. The tests assess the normality of the distribution of scores. A non-significant test result (i.e., a score greater than 0.05) indicates a normal distribution (Hair *et al.*, 2010). The Kolmogorov–Smirnov Z and Shapiro–Wilk tests revealed a non-normal distribution at $p = 0.000$ for all the variables.

To ensure the reliability of the study, Cronbach’s coefficient alpha was conducted to test the internal consistency reliability and assess the consistency of the indicators that formulate the measurement scale (Hair *et al.*, 2010; Zhao, 2017). Ursachi *et al.* (2015) clarified that although a value 0.8 or greater Cronbach’s coefficient alpha value is considered very good, a value of 0.6–0.7 indicates an acceptable level of reliability. The Cronbach’s alpha coefficient values ranged from 0.769 to 0.905, indicating an acceptable level of internal consistency and scale reliability of the constructs. To determine the structural validity of the measurement scales, Bartlett’s Test of Sphericity and the Kaiser–Meyer–Olkin (KMO) measure of sampling adequacy test was done (Pallant, 2011). Scale validity is achieved, when the value of the KMO measure of sampling adequacy is higher than the acceptable minimum limit of 0.6, and a limit of 1, and the p -value of Bartlett’s test of sphericity is less than 0.05 (Pallant, 2011; Tabachnick and Fidell, 2013). Results of the KMO were 0.844 for the security measures, 0.881 for the fire safety measures, 0.760 for the traffic safety measures, 0.725 for the building safety measures and 0.803 for the health and environment safety measures. The Bartlett test for security measures produced an approximate chi-square of 1,532.964 at a degree of freedom (df) of 78 and a significant p -value of 0.000. For the fire safety measure, approximate chi-square was 1,753.284, $df = 79$ and $p = 0.000$. Traffic safety measures and building safety measures had approximate chi-square values of 705.359 and 1,435.235; $df = 55$ and 91 and $p = 0.000$, respectively. For health and environment safety measures, approximate chi-square was 785.039, $df = 55$ and $p = 0.000$. The results imply that the scales meet the criteria for structural validity, indicating that the scale adequately measures what it is intended to measure.

Both descriptive (MS and standard deviation) and inferential (Mann–Whitney U test) statistics were used to analyse the quantitative data, whereas content analysis was used to analyse the qualitative data. The MS and the standard deviation were used to rank the identified safety measures. Following the result of the normality test, which revealed a non-normal distribution of data, the Mann–Whitney U test, which is a non-parametric test, was deemed suitable to test for significant differences in responses of the participants (Figure 1).

Analysis and discussion

Profile of respondent

The profile of the respondents is presented in Table 1. It is evident that both genders were fairly represented in both universities. Undergraduate students made up more than 87% of the respondents in both universities. Similarly, most of the respondents were between 20 and 25 years of age. Moreover, a total of 98.8% of the respondents had been living in residence for at least two years. This indicates that the respondents had stayed in the

Figure 1.
Research
methodology
flowchart

Table 2 indicate that none of the security measures was rated as “well provided”; only security guard on post and lighting at night were rated as “provided”, whereas as many as five measures (i.e. weapon detector, access control, security alarm, electronically coded locks on the doors and CCTV) were rated as “not provided”. Moreover, four other measures (security signs, written policy prohibiting vandalism, notice board displaying security policies and security patrol around the hostel) were rated as “poorly provided”. The MSs obtained for the fire safety measures indicate that fire alarm, water sprinkler system, emergency protocol posters on the wall, evacuation fire drills and smoke detectors were all rated as “not provided”. Only fire extinguisher was rated as “provided”. Three measures were rated as “somewhat provided”, whereas the remaining four were rated as “poorly provided”. None of the fire safety measures was rated as “well provided”.

	University A		University B		Total		Student housing safety measures
	Respondents	(%)	Respondents	(%)	Respondents	(%)	
<i>Gender</i>							
Male	69	40.8	77	45.6	146	43.2	
Female	100	59.2	92	54.4	192	56.8	
<i>Total</i>	<i>169</i>	<i>100</i>	<i>169</i>	<i>100</i>	<i>338</i>	<i>100</i>	
<i>Level of study</i>							
Undergraduate	150	88.8	148	87.6	298	88.2	
Postgraduate	19	11.2	21	12.4	40	11.8	
<i>Total</i>	<i>169</i>	<i>100</i>	<i>169</i>	<i>100</i>	<i>338</i>	<i>100</i>	
<i>Years of living in the hostel</i>							
Three years and above	89	52.6	81	47.9	170	50.3	
Two years	76	45.0	88	52.1	164	48.5	
One year	4	2.4	0	0	4	1.2	
<i>Total</i>	<i>169</i>	<i>100</i>	<i>169</i>	<i>100</i>	<i>338</i>	<i>100</i>	
<i>Age group</i>							
Under 20 years	3	1.8	6	3.6	9	2.7	
20–25 years	113	66.8	145	85.8	258	76.3	
26–30 years	37	21.9	11	6.5	48	14.2	
31–35 years	14	8.3	1	0.6	15	4.4	
Over 36 years	2	1.2	6	3.6	8	2.4	
<i>Total</i>	<i>169</i>	<i>100</i>	<i>169</i>	<i>100</i>	<i>338</i>	<i>100</i>	

Table 1.
Demographic details

Regarding building safety measures, the MSs reveal that handrails on the door, burglar bars on the window and covered indoor drains were rated as “provided”, whereas disabled toilet facility, lift for disabled students and burglar bars on doors were rated as “not provided”. Moreover, showers and indoor ventilation were rated as “poorly provided”, whereas the remaining measures were rated as “somewhat provided”. For the traffic safety measures, parking space for students and visitors was rated as “well provided”, whereas guard for vehicle monitoring and traffic light were rated as “not provided”. Moreover, pedestrian crossing and tags for vehicles were rated as “poorly provided”. Regarding the health and environment measures, only on-campus clinic was rated as “well provided”, whereas first aid box and emergency medical trained personnel on post were rated as “not provided”. The remaining measures were either rated as “provided” or “somewhat provided”. Seventeen out of the 60 measures were rated as “not provided”, whereas 13 were rated as “poorly provided”. Only two measures were perceived as “well provided”, whereas 13 were rated as “provided”.

The interview supports the student ratings. The SHE officer pointed out that although several security and safety measures were provided, there were some lapses in the safety and security measures provided in the student housing. She revealed that the control room was vandalised by students during the #FeesMustFall protest, which has rendered most of the security measures on campus non-functional. It also came to light that CCTV was not provided in some of the student housing; smoke detectors and water sprinkler systems were provided on academic buildings but not in the residences; electronic coded doors were only found in the postgraduate residence; access control was poor; some of the fire alarms were not functioning; and burglar bars were not provided on the residence doors. Moreover, the interviewee revealed that there were no lifts for the disabled; disabled toilet facilities were ill-equipped; and weapon detectors were not provided at security checkpoints.

Table 2.
Provision of safety
and security
measures

Measures	Mean score	SD	Ranking
<i>Security</i>			
Lighting at night in/around the hostel	4.02	1.112	1
Security guard on post	3.61	1.023	2
Fencing around the hostel	3.06	1.548	3
Security checkpoints at the entrance of the hostel	3.00	1.259	4
Security signs for warning	2.55	1.465	5
Written policy prohibiting vandalism	2.46	1.424	6
Notice board displaying security policies	2.04	1.290	7
Security patrol around the hostel	1.80	0.972	8
Access control with functional smart card	1.70	1.060	9
Security alarm	1.58	1.072	10
Electronic coded locks on the doors at the hostel	1.54	1.131	11
Weapon detector at security checkpoint	1.25	0.654	12
CCTV	1.24	0.611	13
<i>Fire safety</i>			
Fire extinguishers	3.53	1.123	1
Fire hose reels	3.34	1.331	2
Fire hydrants	3.33	1.109	3
Electrical outlet and switches	3.31	1.300	4
Fire assembly point	2.56	0.935	5
Fire safety signs	2.51	1.526	6
Emergency exit	2.48	1.196	7
Emergency helplines	1.87	0.946	8
Fire alarm	1.74	1.027	9
Water sprinkler system	1.65	1.006	10
Emergency protocol posters on the wall	1.65	1.038	11
Evacuation fire drills	1.58	0.926	12
Smoke detectors	1.41	0.712	13
<i>Building safety</i>			
Handrails on the stairs	3.82	1.170	1
Burglar bars on the windows	3.81	1.295	2
Covered indoor water main	3.46	1.213	3
Covered outdoor water mains	3.27	1.229	4
Walls painted	3.23	1.105	5
Stairs ways illuminated	3.19	1.294	6
Tiles on the floor (not lifting and no cracks)	3.08	1.141	7
Electric wire protected	3.01	1.344	8
Walls plastered (no cracks)	2.99	1.049	9
Showers (without leakage)	2.54	1.037	10
Indoor ventilation	2.08	1.091	11
Disable toilet facilities	1.28	0.771	12
Burglar bars on the doors	1.22	0.540	13
Lift for disable students	1.15	0.514	14
<i>Traffic safety</i>			
Parking space for students and visitors	4.25	0.787	1
Unobstructed parking area	4.05	0.985	2
Hostel road safe for vehicle use	4.05	1.004	3
Speed bumps	3.92	1.175	4
Traffic sign	3.33	1.397	5
Parking for disable	3.33	1.491	6
Pedestrian crossing	3.28	1.471	7

(continued)

Measures	Mean score	SD	Ranking	Student housing safety measures
Tags for vehicles	2.17	1.36	8	<div>385</div>
Vehicle access control	2.04	1.107	9	
Guard for vehicle monitoring	1.58	0.956	10	
Traffic light/robots	1.19	0.684	11	
<i>Health and environment safety</i>				
On-campus health clinic	4.37	0.779	1	
Grass (lawn) maintenance	4.00	0.934	2	
Waste bin facilities	3.85	1.001	3	
Waste disposal area	3.55	1.152	4	
Cleaning around the hostel	3.42	1.075	5	
Barricades for ongoing construction	3.38	1.235	6	
Accident book	1.80	0.976	7	
First aid box	1.77	0.861	8	
Emergency medical trained personnel on post	1.52	0.794	9	
Table 2.				

Table 2.

With regards to traffic safety, she admitted that there were limited number of guards available to monitor vehicles and further indicated that although traffic lights were not provided, they are not needed as the campus is not too busy. She stated, “A well-equipped on-campus health clinic is provided for the students, though the clinic only attends to students during office hours. The on-campus clinic does not offer 24 hours’ service”. The challenge of maintenance came to the fore. The interviewee pointed out that students complained of leaking showers and broken tiles on the floor in the residence, which she reported to maintenance who were in the process of repairing them. It is evident from the preceding that the general provision of the safety and security measures are unsatisfactory.

Provision of safety and security measures (university B)

It can be inferred from [Table 3](#) that security guard on post, security checkpoint, lighting at night and fencing were all rated as “well provided”. In contrast, weapon detector was rated as “not provided”. Moreover, CCTV was rated as “poorly provided”, whereas the remaining measures were rated as “provided”. Although it appears most security measures are provided, it is evident that CCTV and weapon detector are poorly/not provided. Regarding the fire safety measures, the MSs obtained indicate that all the measures were rated as either “provided” or “well provided” except for water sprinkler, which was rated as “not provided”.

For the building safety measures, lift for disabled students and burglar bars on doors were rated as “not provided”, whereas disable toilet facility was rated as “poorly provided”. Furthermore, the MSs reveals that the remaining measures were perceived as either “provided” or “well provided”. Regarding the traffic safety measures, three measures (i.e. parking space for students and visitors, road safe for vehicle use and pedestrian crossing) were perceived as “well provided”. Parking for the disabled was perceived as “somewhat provided” and tags for vehicles as “poorly provided”. Again, only the disabled measure did not receive a good rating. All the health and environment measures were rated as “well provided”, except medical trained personnel, accident logbook and first aid box (rated as “poorly provided”). A total of 46 out of the 60 measures was rated as either “provided” or “well provided”. Five measures were rated as “not provided”, whereas six were rated as “poorly provided”.

The interview conducted in university B also confirms the student ranking. For example, the fire coordinator indicated that as part of compliance, there was provision for firefighting

Table 3.
Provision of safety
measures
(university B)

Measures	Mean score	SD	Ranking
<i>Security</i>			
Security guard on post	4.63	0.660	1
Lighting at night in/around the hostel	4.46	0.731	2
Security checkpoints at the entrance of the hostel	4.28	0.887	3
Fencing around the hostel	4.20	1.090	4
Access control with functional smart card	4.15	0.946	5
Security patrol around the hostel	4.12	0.907	6
Security alarm	3.98	1.186	7
Security signs for warning	3.81	1.170	8
Electronic coded locks on the doors at the hostel	3.63	1.723	9
Written policy prohibiting vandalism	3.60	1.099	10
Notice board displaying security policies	3.36	1.116	11
CCTV	2.12	1.129	12
Weapon detector at security checkpoint	1.22	0.700	13
<i>Fire safety</i>			
Fire extinguishers	4.35	0.685	1
Emergency helplines	4.21	0.978	2
Fire alarm	4.13	0.918	3
Fire hose reels	4.08	0.751	4
Electrical outlet and switches	4.08	0.816	5
Fire hydrants	4.00	0.702	6
Fire safety signs	4.00	0.897	7
Smoke detectors	4.00	1.000	8
Emergency protocol posters on the wall	3.84	1.115	9
Fire assembly point	3.75	1.139	10
Evacuation fire drills	3.64	1.210	11
Emergency exit	3.55	0.967	12
Water sprinkler system	1.63	1.197	13
<i>Building safety</i>			
Covered outdoor water mains	4.39	0.851	1
Burglar bars on the windows	4.38	1.037	2
Covered indoor water mains	4.36	0.852	3
Tiles on the floor (not lifting and no cracks)	4.24	0.986	4
Walls painted	4.14	0.828	5
Electric wire protected	4.02	1.077	6
Handrails on the stairs	3.97	1.091	7
Stairs ways illuminated	3.79	1.233	8
Walls plastered (no cracks)	3.71	1.132	9
Indoor ventilation	3.63	0.845	10
Showers (without leakage)	3.55	0.968	11
Disable toilet facilities	1.83	1.240	12
Lift for disable students	1.35	0.951	13
Burglar bars on the doors	1.33	0.979	14
<i>Traffic safety</i>			
Parking space for students and visitors	4.35	0.854	1
Hostel road safe for vehicle use	4.30	0.919	2
Pedestrian crossing	4.30	0.992	3
Traffic sign	3.93	1.064	4
Speed bumps	3.86	1.112	5
Vehicle access control	3.72	1.170	6
Guard for vehicle monitoring	3.60	1.178	7

(continued)

Measures	Mean score	SD	Ranking	Student housing safety measures
Unobstructed parking area	3.37	0.875	8	<div>387</div> <div>Table 3.</div>
Parking for disable	3.32	1.429	9	
Tags for vehicles	2.34	0.981	10	
Traffic light/robots	1.25	0.682	11	
<i>Health and Environment safety</i>				
Waste bin facilities	4.59	0.736	1	
Waste disposal area	4.57	0.722	2	
Cleaning around the hostel	4.55	0.671	3	
Barricades for ongoing construction	4.55	0.692	4	
On-campus health clinic	4.53	0.781	5	
Grass (lawn) maintenance	4.48	0.765	6	
Accident book	2.25	0.953	7	
Emergency medical trained personnel on post	2.03	1.102	8	
First aid box	2.02	1.108	9	

equipment and fire alarms that are linked to the fire detection system; however, he mentioned that water sprinkler system was not provided. Moreover, he stated:

[...] since we came back from #FeesMustFall, to get all fire safety measures in place has been really difficult because we as the university are still recovering from the damages [...] which has brought huge safety gap in the student housing facilities and entire campus environment.

With regards to traffic safety, the safety officer indicated that required measures such as parking space, speed bumps and various traffic signs were provided. However, he had this to say about traffic lights on campus, “Yes, it would be awesome to have it especially at our T-junctions, but at the moment we don’t have it”.

The SHE officer also confirmed that lift and toilet for the disabled were lacking, and further clarified that the clinic operated only during the day. The interviewees also indicated that weapon detectors were not provided. It also became evident from the interview that CCTV was not well provided, and burglar bars were not provided on the student housing doors.

Comparative analysis of university A and B

Table 4 presents the MSs of the assessed safety measures, their rank orders, the gaps between the MSs of the two campuses and results of the Mann–Whitney U test.

Hypothesis testing

The study hypothesised that there are no significant differences in the perceptions of the respondents in the two campuses, regarding the provision of safety measures in the university student housing (*H0*). The alternate hypothesis was that there are significant differences in the perceptions of the respondents in the two campuses, regarding the provision of safety measures in the university student housing (*H1*). To test the set hypothesis, the Mann–Whitney U test was conducted. Mann–Whitney U test is the non-parametric version of the parametric *t*-test used to assess independent samples by comparing the median of the two different groups on a continuous measure and converting the scores obtained to ranks. It then determines whether significant differences exist between the two groups (Pallant, 2011; Field, 2013). The values to consider after the Mann–Whitney-U test are the Z value and the significance value, which are represented as the Asymp. Sig (two-tailed). A Sig. value of 0.05 or smaller ($p \leq 0.05$) indicates a significant difference between groups.

	University A		University B		Overall			Mann-Whitney U	
	Mean	Rank	Mean	Rank	Gap	Mean	Rank	z-value	Sig.
<i>Security measures</i>									
Lighting at night in/around the hostel	4.02	1	4.46	2	0.44	4.24	1	-3.452	0.001
Security guard on post	3.61	2	4.63	1	1.02	4.12	2	-9.935	0.000
Fencing around the hostel	3.06	3	4.20	4	1.14	3.64	4	-7.062	0.000
Security check points (hostel)	3.00	4	4.28	3	1.28	3.65	3	-9.279	0.000
Security signs for warning	2.55	5	3.81	8	1.26	3.19	5	-7.569	0.000
Written policy prohibiting vandalism	2.46	6	3.60	10	1.14	3.06	6	-6.818	0.000
Notice board (security policies)	2.04	7	3.36	11	1.32	2.69	10	-8.333	0.000
Security patrol around the hostel	1.80	8	4.12	6	2.32	2.97	7	-13.919	0.000
Access control	1.70	9	4.15	5	2.45	2.93	8	-13.789	0.000
Security alarm	1.58	10	3.98	7	2.40	2.82	9	-12.748	0.000
Electronic coded locks on the doors	1.54	11	3.63	9	2.09	2.59	11	-10.494	0.000
Weapon detector	1.25	12	1.22	13	0.03	1.24	13	0.909	0.363
CCTV	1.24	13	2.12	12	0.88	1.67	12	-8.893	0.000
<i>Fire safety measures</i>									
Fire extinguishers	3.53	1	4.35	1	0.82	3.95	1	-7.401	0.000
Fire hose reels	3.34	2	4.08	4	0.74	3.71	3	-4.896	0.000
Fire hydrants	3.33	3	4.00	6	0.67	3.66	4	-5.846	0.000
Electrical outlet and switches	3.31	4	4.08	5	0.77	3.70	3	-5.615	0.000
Fire assembly point	2.56	5	3.75	10	1.19	3.15	6	-9.546	0.000
Fire safety signs	2.51	6	4.00	7	1.49	3.21	5	-7.959	0.000
Emergency exit (fire escape doors)	2.48	7	3.55	12	1.07	3.02	8	-8.176	0.000
Emergency helplines	1.87	8	4.21	2	2.34	3.06	7	-13.714	0.000
Fire alarm	1.74	9	4.13	3	2.39	2.99	9	-13.116	0.000
Water sprinkler system	1.65	10	1.63	13	0.02	1.64	13	1.130	0.259
Emergency protocol posters	1.65	11	3.84	9	2.19	2.76	10	-12.679	0.000
Evacuation fire drills	1.58	12	3.64	11	2.06	2.62	12	-11.616	0.000
Smoke detectors	1.41	13	4.00	8	2.59	2.67	11	-14.068	0.000
<i>Traffic safety measures</i>									
Parking space for students/visitors	4.25	1	4.35	1	0.19	4.30	1	-1.824	0.068
Unobstructed parking area	4.05	2	3.37	8	0.68	3.72	5	7.116	0.000
Hostel road safe for vehicle use	4.05	3	4.30	2	0.25	4.17	2	-2.580	0.010
Speed bumps	3.92	4	3.86	5	0.06	3.89	3	1.030	0.303
Traffic sign	3.33	5	3.93	4	0.60	3.63	6	-3.854	0.000
Parking for disable	3.33	6	3.32	9	0.01	3.33	7	0.291	0.771
Pedestrian crossing	3.28	7	4.30	3	1.02	3.78	4	-6.712	0.000
Tags for vehicles	2.17	8	2.34	10	0.17	2.26	10	-2.863	0.004
Vehicle access control	2.04	9	3.72	6	1.68	2.91	8	-10.221	0.000
Guard for vehicle monitoring	1.58	10	3.60	7	2.02	2.61	9	-11.973	0.000
Traffic light/robots	1.19	11	1.25	11	0.06	1.22	11	-1.478	0.139
<i>Building safety measures</i>									
Handrails on the stairs	3.82	1	3.97	7	0.15	3.89	3	-1.081	0.280
Burglar bars on the windows	3.81	2	4.38	2	0.51	4.09	1	-5.173	0.000
Covered indoor water mains	3.46	3	4.36	3	0.90	3.92	2	-6.881	0.000
Covered outdoor water mains	3.27	4	4.39	1	1.12	3.84	4	-8.555	0.000
Walls painted	3.23	5	4.14	5	0.91	3.69	5	-7.625	0.000
Stairs ways illuminated	3.19	6	3.79	8	0.60	3.50	8	-4.679	0.000
Tiles (not lifting and no cracks)	3.08	7	4.24	4	1.16	3.67	6	-8.952	0.000
Electric wire protected	3.01	8	4.02	6	1.01	3.53	7	-6.964	0.000
Walls plastered (no cracks)	2.99	9	3.71	9	0.72	3.36	9	-5.854	0.000
<i>(continued)</i>									

	University A		University B		Gap	Overall		Mann–Whitney U		Student housing safety measures
	Mean	Rank	Mean	Rank		Mean	Rank	z-value	Sig.	
Showers (without leakage)	2.54	10	3.55	11	1.01	3.05	10	−8.715	0.000	389
Indoor ventilation	2.08	11	3.63	10	1.55	2.85	11	−11.289	0.000	
Disable toilet facilities	1.28	12	1.83	12	0.55	1.55	12	−4.490	0.000	
Burglar bars on the doors	1.22	13	1.33	14	0.11	1.28	13	0.607	0.544	
Lift for disable students	1.15	14	1.35	13	0.20	1.25	14	−1.718	0.086	
<i>Health and environment measures</i>										
On-campus health clinic	4.37	1	4.53	5	0.16	4.45	1	−2.600	0.009	Table 4.
Grass (lawn) maintenance	4.00	2	4.48	6	0.48	4.25	3	−5.399	0.000	
Waste bin facilities	3.85	3	4.59	1	0.74	4.23	5	−8.173	0.000	
Waste disposal area	3.55	4	4.57	2	1.02	4.06	9	−8.908	0.000	
Cleaning around the hostel	3.42	5	4.55	3	1.13	3.99	11	−10.202	0.000	
Barricades for ongoing construction	3.38	6	4.55	4	1.17	4.02	10	−9.159	0.000	
Accident book	1.80	7	2.25	7	0.45	2.01	51	−4.670	0.000	
First-aid box	1.77	8	2.02	9	0.25	1.87	52	−1.355	0.176	
Medical trained personnel on post	1.52	9	2.03	8	0.51	1.71	53	−3.810	0.000	

Results from the Mann–Whitney U test in Table 4 reveals that majority of the safety measures had a significant *p*-value of less than 0.05, indicating a statistically significant difference in the perception of respondents regarding the provision of safety measures in the university student housing. In Table 5, the summary of the Mann–Whitney U test for all the safety measures shows a Z-value of −6.096 and significant *p*-value of 0.000, indicating a statistically significant difference in the perceptions of the respondents from both universities regarding the provision of safety measures in the student housing of the universities. Therefore, *H*₀ is rejected, and the alternate hypothesis is supported.

Discussion

It is evident from Table 4 that the safety and security measures provided in university B student housing are better than the provisions made in university A. Whereas 19 measures were perceived as well provided in university B, only two measures were perceived as well provided in university A. Moreover, 13 measures were rated as provided in university A, whereas as many as 27 measures were rated as provided university B. Besides, whereas five measures were rated as not provided in university B, a total of 17 measures was rated as not provided in university A. Additionally, as many as 13 measures were perceived as poorly provided in university A. In contrast, only six were rated as poorly provided in university B. The Mann–Whitney U test reveals that the gaps between the two universities for most of the measures are statistically significant. Moreover, the Mann–Whitney U test for all the safety measures confirms that the difference in the perceptions of the respondents from both universities regarding the provision of safety measures in the student housing of the universities is statistically significant. Furthermore, the interview conducted revealed that

Mann–Whitney U	133.000	Table 5. Mann–Whitney U test summary for university A and B
Wilcoxon W	1,358.000	
Test statistic	133.000	
Z	−6.096	
Asymptotic sig. (two-sided test)	0.000	

university A had more lapses than university B. It must be specified that university A is more disadvantaged than university B. The report of the Department of Higher Education and Training similarly reveals that the previously disadvantaged universities have a lot more lapses in the security and safety measures provided in the student housings ([Department of Higher Education and Training, 2011](#)).

Although university B had a better provision than university A, there are few measures that were either poorly provided or not provided in the student housing of both universities. In fact, the Mann–Whitney U test reveals that the gaps between 11 measures were not statistically significant. Six (i.e. weapon detector, water sprinkler system, traffic light, burglar bars on the doors, lift for disable student and first aid box) out of the 11 measures were rated as not provided or poorly provided in both universities. Moreover, CCTV, tags for vehicles, disabled toilet facility, accident book and medical trained personnel were also rated as either poorly provided or not provided in both universities. The interview conducted also confirmed the lack in the provision or inadequate provision of these measures. Some of these lapses were also identified in other studies. For example, Gopal and Niekerk (2018) and [Adisa *et al.* \(2019\)](#) identified poor security systems, lack of weapon detector and inadequate CCTV amongst others as some of the lapses in university residences.

University A had a lot more lapses in the security and safety measures provided. Measures including access control, security alarm, electronic coded locks on the doors, security signs, written policy prohibiting vandalism, notice board displaying security policies and security patrol around the hostel; fire alarm, emergency protocol posters on the wall, evacuation fire drills, smoke detectors, fire assembly point, fire safety signs, emergency exit, emergency helplines; showers (without leaks) and indoor ventilation; guard for vehicle monitoring and pedestrian crossing; and first aid box were either poorly provided or not provided. The SHE officer from university A mentioned some of these lapses and indicated that students complained of leaking showers and broken floor tiles in their residences. These findings collaborate with the studies of [Department of Higher Education and Training \(2011\)](#), [Gopal and Niekerk \(2018\)](#), [Rodriguez *et al.* \(2013\)](#) and [Adisa *et al.* \(2019\)](#). [Rodriguez *et al.* \(2013\)](#) found several risk factors including insufficient pedestrian crossings, absences of security guards in some areas, lack of smart access card, broken windows and missing ceiling panels, some damaged fire alarms and smoke detectors, lack of clearly marked fire exit door signs and obstructed fire exit doors.

There were, however, measures that were either provided or well provided in both universities. A total of 14 measures were perceived as either provided or well provided in university A, whereas a total of 47 out of the 59 measures were rated as either “provided” or “well provided” in university B. [Rodriguez *et al.* \(2013\)](#) similarly found that the University of South Africa made adequate provision for some security/safety measures.

Conclusion

Security, safety, environment and health are essential consideration in the management of all forms of facilities, including student housing. Student housing is meant to promote the living and learning experience of students. This purpose cannot be achieved if there are lapses in the measures provided to maintain the security and safety of student housing. The study reported in this paper investigated and compared the safety measures provided in the student housing of two universities in South Africa. The findings reveal that university B had a better provision of safety measures in the student housing than university A. Whereas the differences between the provision of most measures were statistically significant, few measures recorded statistically insignificant differences. The study also found that both universities had some lapses in the safety and security measures provided in the student housing. Measures that were lacking or poorly provided in both universities were weapon detector, CCTV, water sprinkler

system, burglar bars on the doors, lift for disabled student, disabled toilet facility, traffic light, tags for vehicles, first aid box, accident book and medical trained personnel. Both universities had lapses in some of the measures provided; therefore, it is recommended that all the lapses that could expose students to high risk be attended to urgently. Besides, regular inspections and reporting on the security and safety requirements are required. Other universities are also encouraged to institute regular security and safety inspections to identify security and safety lapses timeously. Both university management and policymakers could benefit from the findings of this study. This study also contributes to the body of knowledge in the field of student housing security and safety studies. Data were collected from only two universities; therefore, a study that expands the number of participating universities is recommended.

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Corresponding author

Fredrick Simpheh can be contacted at: simfredy24@yahoo.com