

## Article

# Assessment of Fire Safety Management for Special Needs Schools in South Africa

Tlou D. Raphela \*  and Ndivhuwo Ndaba

Disaster Management Training and Education Centre for Africa, University of the Free State,  
Bloemfontein 9301, South Africa; 2019146626@ufs4life.ac.za

\* Correspondence: madeizen@gmail.com; Tel.: +27-72-1084-987

**Abstract:** The safety and well-being of learners with special educational needs in South Africa remain a paramount concern, significantly impacting their constitutional rights and dignity. Despite legislative commitments aimed at fostering inclusive education, a pervasive absence of adequate fire safety measures in special needs schools (SNSs) in South Africa has persisted, leading to the vulnerability of these learners. Tragic incidents, such as fatal fires in these schools, as reported in the literature, underscore the urgent need for immediate intervention to ensure the safety and security of these learners, especially with regards to fire hazards. This study, conducted within the Northwest Province of South Africa, assessed the state of fire safety management in SNSs by applying a series of chi-squared ( $\chi^2$ ) tests of independence for categorical variables, descriptive statistics, and regression analysis using the Statistical Package for Social Scientists (SPSS), Version 20 and found that limited access to power is the potential root cause of fires in these schools; also, the limited amount of fire safety initiatives was a problem. In addition, the ordinal regression showed a statistically significant relationship when the question of to what extent the learners in the sampled schools are involved in fire safety programs was regressed with the questions of whether management and stakeholders were involved in fire safety programs and also on taking part in the physical fire safety programs ( $\chi^2 = 47.412$ ;  $df = 2$ ;  $p < 0.001$ ;  $R^2 = 70.5\%$ ). Furthermore, fire safety management was not sufficiently implemented in the sampled schools and the safety legislations of the country were not implemented accordingly when it came to fire safety. This study identified root causes of fire risks, gauged stakeholders' awareness and involvement in fire safety management, and advocated for more stringent safety policies and practices within the SNS based on the above findings.

**Keywords:** root causes; fire safety; fire management; programs; special needs schools



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## 1. Introduction

Globally, fire-related burns account for over 300,000 deaths per year, with more deaths from scalds, electricity, chemical burns, and other forms of burns [1–3]. Developed countries have achieved a lot in terms of reducing the burden of injury and mortality from burns through the implementation of proven interventions, including promoting the use of smoke detectors [3,4]. Indeed, Peck [4] also reported achievements through the regulation of water heater temperature and flame-retardant children's sleepwear. However, such strategies have yet to be widely applied in low- and middle-income countries, where mortality rates due to fires remain relatively high, especially among the poorer members of societies in developing countries [5]. Fires remain a global challenge that is largely neglected, while their occurrence has the potential to affect communities by causing deaths, serious injuries, and damage to properties, as well as long-term livelihood impacts [6].

In developing countries, the consequences of fires are even more severe when compared to developed countries, as highlighted by Buchanan and Abu [7]. Severely disfigured survivors in these regions have been reported to face unemployment, extreme poverty, social isolation, and, in some cases, abandonment from victim's own families [8]. Moreover,

fire survivors in most developing countries often experience overwhelming emotional trauma, leading to withdrawal from society [9]. This isolation can exacerbate the challenges of healing and recovery, as survivors grapple with post-traumatic stress, anxiety, depression, and loss of motivation, as noted by Torpy et al. [10]. Thus, the burden of burn injuries disproportionately affects the world's impoverished populations [11].

The World Health Organisation (WHO) [12] reported that over 95% of fire-related burns occur in low- and middle-income countries. Within this group of nations, burn-related deaths and injuries are more common among individuals with lower socioeconomic status. Even though fires have been reported to cause disruptions and loss of lives in most parts of the world [13,14], children with special educational needs are at a higher risk of the devastating effects caused by a burn injury [15]. However, little is known about their burn prevention needs and fire safety management in their schools [15]. For example, a study conducted in Baltimore City Hospital reported that 25% of the children treated have special educational needs or have previously been diagnosed with chronic physical, mental, or emotional needs [16]. In an urban Kentucky elementary school, case reports were used to describe the devastating effects of scald injuries in seven children with special educational needs [16]. There is a lack of research on fire safety management for special needs school communities and this is an area that needs further research. Previous studies simply describe some of the burn injury epidemiology in these communities. Jenkins et al. [17] have demonstrated that fire safety management knowledge is imperative.

Children with special educational needs are at greater risk of burn injuries [18]. These children have been reported by the literature to be at greater risk of death and injury from scalds or contact burns [19,20]. Again, these children who are burned and survive may experience a loss of function, deformity, pain, and psychological trauma [21,22]. Whether a disparity exists for children with special educational needs concerning fire-safety priorities is unknown but is an area of research that warrants further investigation. In addition, little is known as to how fires are affecting special needs schools, especially in developing countries with generally limited resources, where learners have a spectrum of distinct cognitive and social needs [23]. Here, we assessed fire safety management in these schools in the Northwest Province of South Africa. The literature on fire safety management in these schools is scant, especially in South Africa; however, Kempen and Steyn [24] reported that teachers in the Gauteng Province have complained about an initiated fire safety management program, citing it as an additional burden added to their already heavy workload.

## 2. Research Methodology

This study adopted a pragmatist research approach, which emphasises the use of both quantitative and qualitative methods to address research questions comprehensively and gain a well-rounded understanding of the research topic. Pragmatism is a philosophy that promotes practicality and flexibility, allowing researchers to choose the most suitable methods to answer their research questions effectively [24]. In line with the pragmatic philosophical worldview, the study adopted a mixed-method approach using a semi-structured questionnaire to gather and analyse data. This study's research design is a narrative one, whereby narrative research depicts the exact features of a scenario with the primary goal of characterising the phenomena.

The study was purposive in nature as data were collected from a selected known target population of nine special needs schools within the Northwest Province, where 83 participants from the nine schools were interviewed using a semi-structured questionnaire. The schools targeted were primary and middle schools and the average age range of the pupil was 7–13 years.

### *Data Analysis and Ethical Consideration*

To assess fire root causes and existing fire safety management strategies in the sampled schools, descriptive and chi-squared ( $\chi^2$ ) tests of independence were applied to the data.

The chi-squared test is a statistical test that is used to compare observed and expected results for two categorical variables. Statistically significant results are the claim that a result from data generated by testing or experimentation is likely to be attributable to a specific cause. Data for this study were not normally distributed. Therefore, the study assessed responses from the data that were not normally distributed and also applied ordinal regression to analyse the three Likert scale questions, setting the question of “to what extent are learners in your school involved in fire safety programs” as the dependent variable; questions of whether management and stakeholders were involved in fire safety programs and also on taking part in the physical fire safety programs were covariates. Indeed, learners with special educational needs also need to be involved in programs happening around them that will not expose them to any harm; hence, this question was set as the outcome variable.

Secondly, to assess fire safety management in the sampled schools, the study ran a series of chi-squared tests of independence by correlating other critical demographic variables with some pertinent questions relating to fire safety management.

Lastly, to explore the sampled schools’ safety legislations and policies to manage fire risks, the study also ran a series of  $\chi^2$  tests of independence.

The Statistical Package for Social Scientists (SPSS) was used to analyse the data for this study, the probability value was set at  $p \leq 0.05$ , and the data were visualised using graphs and tables produced from the SPSS software, Version 20. The study acquired ethical clearance from the University of the Free State, General Human Ethics Committee (GHEC) before data were collected (protocol number UFS-HSD2023/0741).

### 3. Study Objectives

1. To assess the root causes of fire risks in special needs schools in Northwest Province.
2. To assess whether special needs schools’ management and stakeholders are aware of existing fire safety management in the schools.
3. To explore existing school safety legislations and policies to manage fire safety risks in special needs schools in the Northwest Province.

### 4. Results

This study assessed the fire root causes, existing fire safety management, and school fire safety legislations, including policies within the sampled special needs schools. A total of 83 semi-structured questionnaires (Supplementary Materials) were administered to nine special needs schools within the Northwest Province of South Africa and feedback was received for all 83 questionnaires (Supplementary Materials). The majority of the respondents were female, and most respondents were single and employed full time.

#### 4.1. Fire Root Causes and Safety Programs

The study analysed the fire root causes and existing fire safety management by looking at the main causes and ideologies as per the Pressure and Release (PAR) model descriptively. The study asked the respondents (school officials including principals, educators, and members of the School Governing Body) if their schools have limited access to power, structure, resources, political, economic, and social systems as these limits are generic root causes of most disasters, as per Wisner et al.’s [25] PAR model. All nine special needs schools sampled are government-owned and 100% government-controlled. Therefore, the power to make structural, economic, and social changes lies in the availability of funds from the government. Issues of politics also play a role as appointments of the staff and resource acquisitions are organized in the political sphere of the Provincial Government. The predetermined responses were set on a Lickert scale of four levels (yes, no, not sure, and prefer not to say).

All respondents ( $n = 83$ ) reported that their schools have limited access to resources and political, economic, and social systems. When it comes to limited access to power, the majority of the respondents ( $n = 54$ ) reported that their schools have limited access to

power. Interestingly, all respondents ( $n = 83$ ) reported that they do not have limited access to structure (Table 1).

**Table 1.** Respondents’ responses on fire root causes. Source: Study data.

Schools Have Limited Access to the Below?	Yes	No	Not Sure	Prefer Not to Say
power	54 (65%)	29 (35%)	0	0
structure	0	83 (100%)	0	0
resources	83 (100%)	0	0	0
political systems	83 (100%)	0	0	0
economic systems	83 (100%)	0	0	0
social systems	83 (100%)	0	0	0

The study sought to understand the existence of special needs school safety management programs and involvement in fire safety management by first asking the respondents about the fire safety training programs their schools are involved in and the involvement of school management, stakeholders, and learners in these programs. The majority of the respondents, 59%, indicated that fire safety management programs are “Not Applicable” in their schools, while a smaller number of respondents ( $n = 9$ ) equally reported fire drills, fire incident planning, and fire protection as the training programs their schools are involved in (Table 2). The least number of respondents ( $n = 7$ ) reported firefighting as another program concerning fire safety training programs (Table 2).

**Table 2.** Fire safety training programs. Source: Study data.

Fire Safety Training Programs	Number of Respondents			
	Frequency	Percent	Valid Percent	Cumulative Percent
Fire drills	9	10.8	10.8	10.8
Fire fighting	7	8.4	8.4	19.3
Fire incident planning	9	10.8	10.8	30.1
Fire protection	9	10.8	10.8	41.0
N/A	49	59%	59%	
Total	83	100	100	

To assess the extent the school management, stakeholders, and learners of the sampled schools are involved in matters related to fire safety, the study asked three questions: (1) To what extent are your school management and stakeholders involved in fire safety programs? (2) To what extent are your school management and stakeholders involved in taking part in the physical fire safety programs? (3) To what extent are learners in your school involved in fire safety programs? The questions were posed in a Likert scale format with five responses ranging from 1 to 5, in a sequence of “Not involved at all” “sometimes involved”; “somewhat involved”; “moderately involved”, and “Extremely involved”.

The results of the ordinal regression showed a statistically significant relationship when the question of to what extent the learners in the sampled schools are involved in fire safety programs was regressed with the other two questions ( $\chi^2 = 47.412$ ;  $df = 2$ ;  $p < 0.001$ ;  $R^2 = 70.5\%$ ). Furthermore, significant differences were found for the dependent variable only (Table 3).

**Table 3.** Output of regression analysis for Likert scale questions on the involvement in fire safety programs. Significant values are highlighted in bold. Source: Study data.

Parameters	Estimates	Std Errors	Wald	<i>p</i> -Values
<b>To What Extent Are Your School...</b>				
management and stakeholders involved in fire safety programs?	20.944	4.639	0.000	0.996
management and stakeholders involved in taking part in the physical fire safety programs?	0.507	0.272	3.474	0.062
learners involved in fire safety programs?	<b>0.693</b>	<b>0.297</b>	<b>5.445</b>	<b>0.020</b>

The majority of the respondents, 92.7%, reported their school management and stakeholders not being involved in physical fire safety programs (Table 4).

**Table 4.** Output of regression analysis for case summaries. Study data.

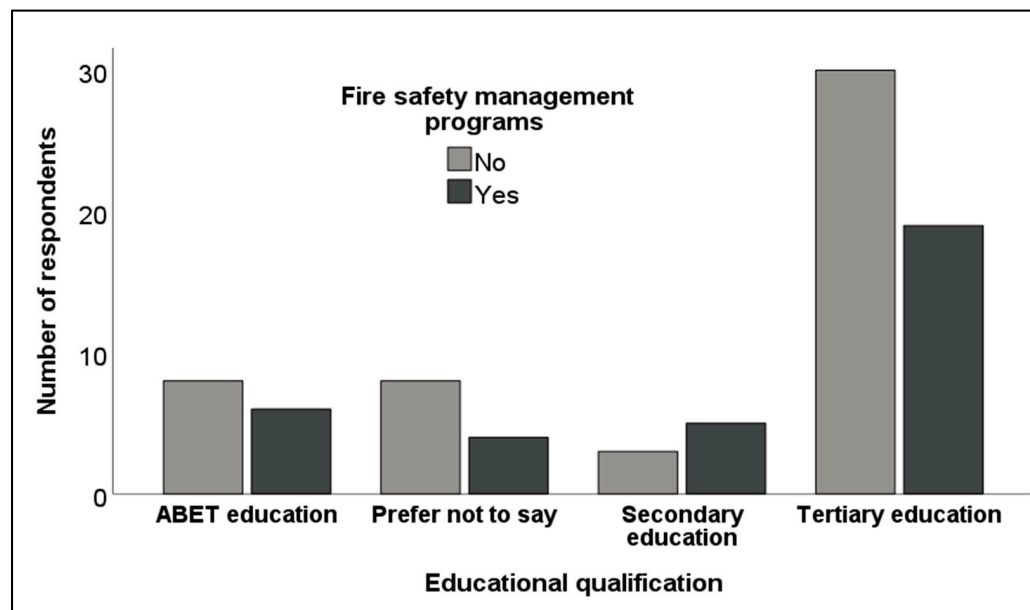
		Lickert Scale Response	
Parameters		Number	
To What Extent Are Your School. . .			
learners involved in fire safety programmes	sometimes involved	34	
	not involved at all	49	
management and stakeholders involved in fire safety programmes	sometimes involved	32	
	not involved at all	51	
management and stakeholders involved in physical fire safety programmes	sometimes involved	6	
	not involved at all	77	
Valid		83	
Missing cases		0	
Total		83	

#### 4.2. Demographics and Fire Safety Management

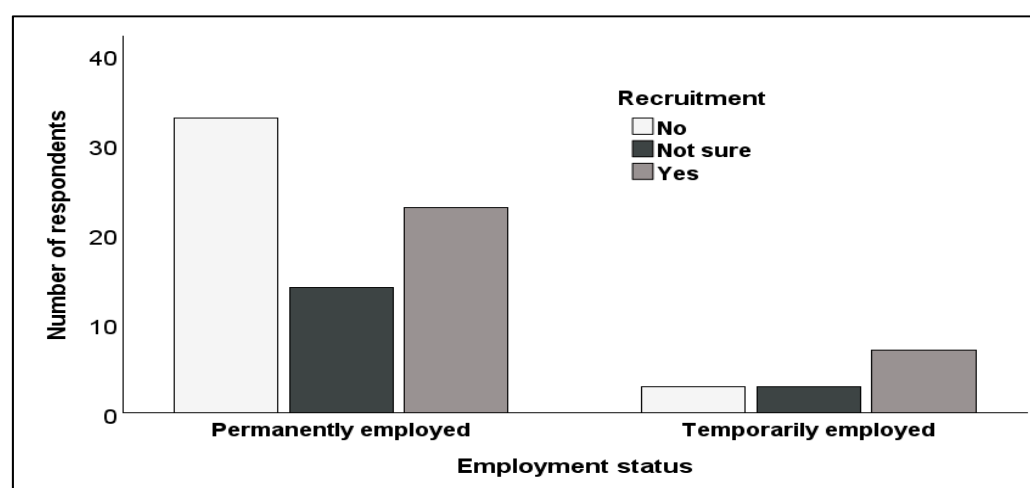
The study sought to find the relationship between several demographic questions and the knowledge and awareness of other pertinent questions that can impact fire safety in the sampled schools.

When the level of education of the respondents was correlated with the presence of fire safety management programs in special needs schools, there was no statistically significant difference between the two variables ( $\chi^2 = 1.941$ ;  $df = 3$ ;  $p = 0.585$ ). The majority of respondents with tertiary qualifications reported that there are no fire safety management programs in their schools. Again, the majority of the respondents across the level of education except for secondary education also reported “No” when asked about the presence of fire safety management in their schools (Figure 1).

When age was correlated with the awareness of the existence of safety policies in the special needs schools, there was no statistically significant relationship ( $\chi^2 = 6.669$ ;  $df = 8$ ;  $p = 0.573$ ). Most of the respondents aged between 36 and 45 displayed a higher level of awareness regarding the existence of safety policies within their schools as compared to any other age group sampled. The chi-squared test results ( $\chi^2 = 7.600$ ;  $df = 4$ ;  $p = 0.107$ ) indicated an insignificant relationship between employment status and the awareness of the recruitment of fire safety officers or a school safety committee in their schools. Interestingly, a noticeably higher number of permanent staff replied “No” when asked if they were aware of the recruitment of safety officers or safety committees (Figure 2).



**Figure 1.** The link between educational qualification and fire safety management programs in special needs schools. Source: Study data. ABET = Adult basic education and training; Secondary education = Grade 8–12 in South African school calendar; Tertiary education = All formal post-secondary education.

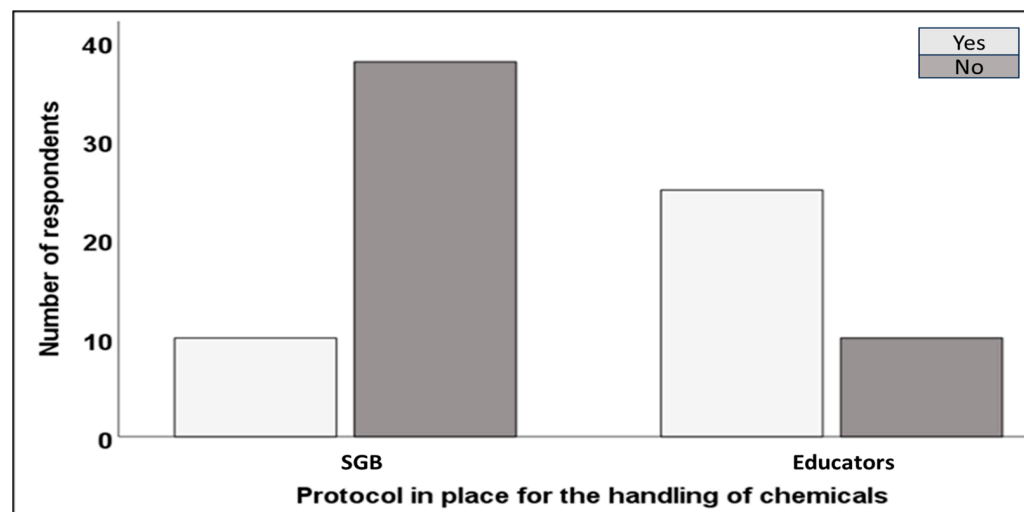


**Figure 2.** The link between employment status and awareness of recruitment of safety officers or committees in special needs schools. Source: Study data.

#### 4.3. Fire Safety Legislation and Policies

When participants were asked about the utilisation of chemicals within special needs schools, a significant number ( $n = 48$ ) indicated that no chemicals were being used. This response suggests a prevailing perception among these respondents that chemical, mostly gas (to use with gas stoves during power cuts) and diesel to operate generators for school continuity during power cuts, reported by some schools in a broad sense, are not part of the regular operations or activities within the sampled schools' environments. The majority of respondents ( $n = 38$ ) acknowledged the use of flammables in their schools, particularly for cleaning and garden maintenance purposes. However, when asked about the presence of protocols for handling these flammables, the majority of the educators responded that such protocols were in place, while the majority of School Governing Body (SGB) members reported that such protocols do not exist (Figure 3).





**Figure 3.** Protocol in place for the handling of chemicals. Source: Study data.

Respondents were asked if the flammables are stored in purpose-made storage and if hazardous substance stores are registered with local fire services. A chi-squared test was conducted, and the results indicated significantly different results ( $\chi^2 = 45.229$ ;  $df = 2$ ;  $p = 0.001$ ). A worrisome majority ( $n = 28$ ) reported flammables that are not stored in purpose-made storage and that hazardous substance stores are not registered with local fire services. Another chi-squared test was applied to assess the relationship between responses when asked if there is any gas used on their school premises and if there is a certificate of conformity for the gas installation or appliances; the results were significant ( $\chi^2 = 79.059$ ;  $df = 1$ ;  $p = 0.001$ ). Most respondents ( $n = 45$ ) reported that in case of load shedding, they use gas on their school premises, while some respondents ( $n = 38$ ) reported the unavailability of a certificate of conformity for the gas installation and usage.

Finally, the study assessed whether the special needs schools sampled have their gas registered with the local fire services and if electrical compliance certificates are available. A chi-squared test was conducted for the two variables and the results were significant ( $\chi^2 = 83.318$ ;  $df = 4$ ;  $p = 0.001$ ). This result shows that there is some sort of fire compliance and willingness to address fire safety in the schools. However, since the schools are 100% government owned, implementations of other things that are beyond the school management's control as far as fire safety management is concerned will be lacking, as shown by the results of the PAR model.

The predominant responses from participants suggested that the question of whether the gas was registered with the local fire services did not apply to their school since they did not have gas cylinders (Figure 4). However, the majority of the educators, as compared to the members of the School Governing Body (SGB), reported that their gas was registered with the local fire services (Figure 4).

Lastly, to gauge the fire safety management measure of the schools sampled, the study correlated the locking of classroom doors when vacant and access gates secured after hours in special needs schools. A chi-squared test was conducted, and the results were insignificantly different ( $\chi^2 = 6.286$ ;  $df = 7$ ;  $p = 0.731$ ). The majority of respondents reported their schools have access control in terms of secured gates and that classrooms are locked after hours when vacant (Figure 5).

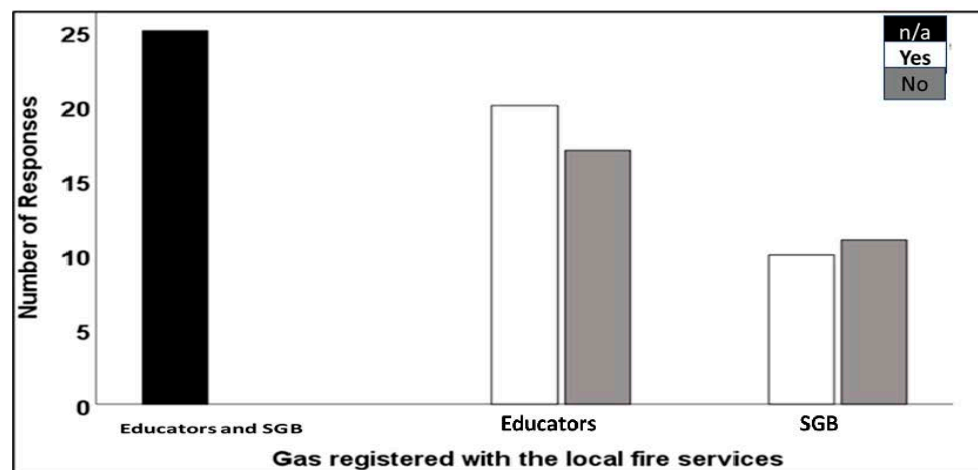


Figure 4. Gas registered with the local fire services. Source: Study data.

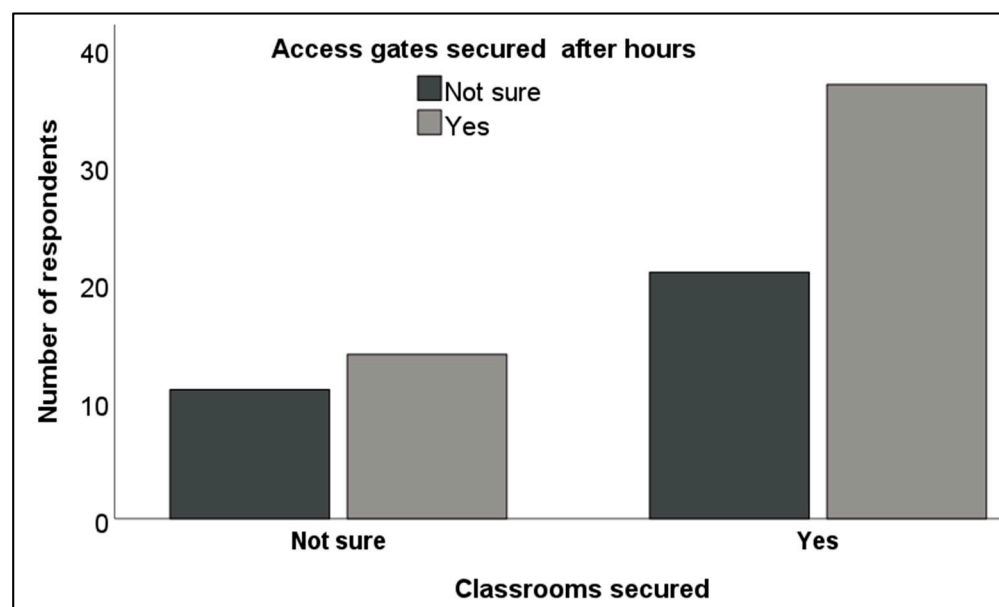


Figure 5. Special needs schools' access control. Source: Study data.

## 5. Discussion

The study assessed the fire safety management of special needs schools in the North-west Province of South Africa and started by correlating several demographic characteristics of the respondents with some pertinent questions relating to fire safety. The age group between 36 and 45 represents a crucial phase in one's life marked by established careers, family obligations, and a relatively stable social and economic status. The question of age was closed on the questionnaire with age group ranges of 18–25 (to include all adults who might form part of the School Governing Body) 26–35; 36–45; 46–55; and 56–65. According to a study conducted by Lehna et al. (2014) [15], individuals in this age group have acquired some professional maturity and accumulated expertise and financial security, potentially contributing to their predominant presence in specific environments. Moreover, findings from studies conducted by Zhang et al. [26] indicate that individuals aged 36–45 are typically engaged in decision-making processes, both in their professional and personal realms, as they are in most cases at the peak of their career. Their well-developed cognitive abilities, refined through years of experience, grant them a balanced perspective, making them influential contributors across various pursuits. Additionally, a study by Golden et al. [27] points out that this age group often displays heightened involvement and dedication to the community or organisational engagements. Their established networks and a strong



sense of responsibility often position them as leaders or significant influencers within their respective domains, making the results about the awareness of safety policies by this age group as compared to other age groups not surprising.

This study finding that permanent employees display a higher level of awareness concerning the recruitment of safety officers, with the highest number of permanent employees reporting no when asked if their schools have safety officers or safety committees, could imply the continuous presence of these employees at the schools, which enables them to acquire more knowledge about the safety personnel within the school premises, making them more aware of safety issues surrounding their permanent employment.

The results that the majority of respondents with tertiary qualifications reported the absence of fire safety management programs in their special needs schools might stem from various factors. Personal experiences and perceptions can significantly influence responses [28]. Respondents with tertiary education might have perceived fire safety management differently or have specific criteria in mind when identifying such programs. For instance, respondents with tertiary qualifications presume formal, structured fire safety courses or comprehensive emergency drills due to the level of their knowledge and information due to the high level of education they obtained or even from the institutions of higher learning they have attended.

A study by Smith et al. [29] suggests that individuals with tertiary education often have higher expectations regarding safety protocols and might be more critical in assessing the adequacy of safety programs. This could lead to a higher likelihood of reporting the absence of programs if their expectations are not met. Moreover, organisational culture and communication channels within schools might also play a role. Indeed, Garcia et al. [30] highlight that occasionally, despite the existence of safety measures, communication gaps or a lack of awareness about these programs among staff members, especially those with higher qualifications, can lead to perceptions of their absence.

The matter of limited access to resources reported by all respondents in the study, particularly in special needs schools concerning fire safety management programs, holds significant implications that demand critical analysis. Limited access to power resources, funding, and specialised training within these schools can profoundly impact the implementation and effectiveness of fire safety measures. A study by Min et al. [31] emphasises that special needs schools often encounter resource constraints, including insufficient funding and limited access to specialised training for staff. These limitations can hinder the development and execution of comprehensive safety programs, including those related to fire safety.

Political systems, which encompass not just financial backing but also the authority and capability to enforce safety measures, are crucial. However, a study by Tompa et al. [32] notes that many special needs schools struggle with political influences at best, lacking the necessary influence to prioritise safety initiatives, and that this could be detrimental to special needs schools. This lack of authority can impede their ability to allocate resources effectively toward fire safety management. Moreover, the literature also highlights the vulnerability of individuals with special educational needs in emergencies. A study by Harry and Klingner [33] underscores that due to the unique requirements and potential mobility limitations of some students with special educational needs, tailored and robust fire safety programs are essential and need political backing and support. In conclusion, limited access to resources, political, social, and economic systems, and resources could exacerbate the vulnerabilities of pupils with special educational needs, placing them and the staff at increased risk during fire incidents.

Among the respondents who did specify various aspects of fire safety training, approximately 10.8%, which is the majority of respondents, highlighted the incorporation of fire drills, emphasising the practical aspect of emergency preparedness. Fire drills are pivotal in familiarising individuals with evacuation procedures and enhancing their responsiveness during fire emergencies [28]. Additionally, a similar proportion, also 10.8%, indicated fire incident planning and fire protection as part of their training programs. This underscores a

focus on strategizing for potential fire incidents and the implementation of preventive measures to mitigate risks within their environments. The smaller percentage of respondents, approximately 8.4%, mentioning firefighting training within their fire safety programs is a concern and this study concludes that even though this analysis highlights the presence of specific aspects within fire safety training, there is a notable proportion of respondents who indicated a lack of defined programs, signifying potential areas for improvement. Clarification within fire safety education initiatives is imperative and training should be a priority in these sampled schools.

The significant regression results show how learners' involvement can have an influence on other safety issues in the schools irrespective of their special educational needs.

The study responses also shed light on the involvement levels of the school community in fire safety programs within educational settings. The study findings revealed limited engagement across this community. In terms of school management and stakeholders' involvement in fire safety programs, especially physical programs, as per Table 3, this substantial majority suggests a significant gap in the active participation of school management and stakeholders in initiatives related to fire safety, which is a necessity for any organisation, especially where there are pupils with special educational needs. Indeed, South African legislation has made fire drills a compulsory activity across institutions to save lives and infrastructures. A substantial lack of engagement and direct involvement from organisations highlights a potential oversight or neglect in prioritising fire safety initiatives within the sampled special needs schools. Similarly, the involvement of learners in fire safety programs presents a notable gap. This implies a substantial portion of learners lacking exposure to fire safety education or active participation in related programs. The results emphasise the need for a more comprehensive integration of fire safety education into the learners' curriculum or activities.

The absence of evacuation plans and the failure to maintain records of fire inspections highlight areas that require immediate attention to enhance safety and emergency preparedness in these educational institutions [34]. Complying with safety regulations is of paramount importance to ensure the well-being of learners and staff [35]. Therefore, these results highlight the awareness of the majority of the respondents regarding keeping evacuation plans and records for their schools.

The study findings regarding the majority of respondents reporting their schools having access control in terms of secured gates after hours and locked classrooms when vacant indicate that the special needs schools sampled have taken proactive measures to ensure the safety and security of their premises. The practice of locking classroom doors when vacant not only helps protect the property within but also provides an additional layer of security to prevent unauthorised access and arson should it be prominent in the areas surrounding the sampled schools. The use of secure padlocks, chains, or electronic systems to secure access gates after hours further reinforces the security of these schools, making them less accessible to potential intruders and arsonists [36]. These study findings highlight a commitment to maintaining a safe and secure environment within special needs schools, even though there are still some major gaps that need to be addressed, such as the root causes; holistic implementation of fire safety programs as per Disaster Management and other relevant legislation mandates; and the involvement and participation of all stakeholders, including the learners, in fire safety programs. Security measures are essential for the protection of students, staff, and school property, contributing to the overall well-being of the school community and reducing the risk of unauthorised access [37].

When respondents were specifically asked about the existence of electronic laboratories or classrooms containing hazardous materials within special needs schools, a noteworthy discrepancy in responses was observed. These responses indicate a potential divergence in comprehension or definition of what qualifies as a "chemical." Respondents might not have recognised certain substances, typical in electronic laboratories like components in devices or experimental materials, as conventional "chemicals" within the broader school context [38]. The acknowledgment of hazardous materials within electronic laboratories

contrasts with the reported absence of chemical usage, signalling a potential disparity in how respondents perceive and classify substances. This incongruity underscores the necessity for lucid communication and standardised definitions concerning safety aspects and the nature of materials employed within educational settings, especially within special needs schools [39].

When some respondents acknowledged the use of flammables in their schools, but with conflicting results between the educators and SGB when asked about the availability of protocols for handling these chemicals, this raised a concern regarding safety measures in these schools harbouring vulnerable pupils. Despite the acknowledgment of their use, the conflicting result when it comes to safe handling might pose potential risks or hazards within the school environment. Ensuring the presence and adherence to stringent protocols for the safe usage, storage, and handling of flammable substances is crucial to mitigating potential fire hazards and ensuring the safety of the sampled school community. This also indicates that a notable subset of schools operate without these materials, potentially rendering specific safety protocols, like registering hazardous substance stores with local fire services, unnecessary [39]. This variance in safety necessities emphasises the diverse safety requirements among different educational institutions and among stakeholders, suggesting that safety measures might need tailoring to accommodate these variations.

The study assessed if the special needs schools sampled have gas registered with the local fire services. The predominant response from participants (educators and SGB members) suggested that the question did not apply to their schools. The second most common response, whereby the majority of the SGB members, as compared to educators, reported gas in the schools and that this was not registered with the local fire services, emphasises the inadequacy of electrical compliance certificates within their premises.

## 6. Conclusions and Recommendations

The study had a primary objective to assess the effectiveness of fire safety management practices in special needs schools in the Northwest Province of South Africa by exploring key sub-objectives. These sub-objectives encompassed identifying root causes of fire risks, assessing the awareness of school management and stakeholders regarding fire safety practices, and exploring existing school safety legislation and policies. The study findings provided insights into the distinctive encounters that special needs schools face in terms of fire safety management, as well as the fire safety awareness among those responsible for safety and the legal framework governing the safety practices. The study findings and insights that were presented indicate the practical and broader implications of the research study. The findings inform a set of recommendations aimed at enhancing fire safety in special needs schools. The study recommends the establishment of safer, more inclusive learning environments for all learners and staff in the special needs schools sampled herein.

A longitudinal study to evaluate the enduring impact of the recommended fire safety measures and policies is recommended. This extended research would provide valuable insights into whether safety improvements persist over time and continue to reduce fire incidents in special needs schools, offering a clearer understanding of the long-term effectiveness of these measures. Additionally, a comparative analysis study is recommended to assess fire safety practices and incidents in special needs schools across different South African provinces. This comparative approach can uncover provincial variations in safety standards and identify best practices that can be shared and implemented on a broader scale. By benchmarking practices against one another, a more comprehensive perspective of fire safety management can be achieved.

A comprehensive analysis of the existing legal and policy framework related to fire safety in South African special needs schools is recommended. This analysis would assess the adequacy of current regulations, identify gaps, and propose potential legal reforms to strengthen safety standards and compliance. This study could not conclude on the exploration of existing school legislative and safety policies because there were conflicting answers between the educators and the SGB when it came to adherence to safety issues,

highlighting some discrepancies in terms of legislation and policies. Therefore, a further study is recommended to ask about existing legislations and policies in these schools. Another vital area of study is the development and implementation of disability-specific safety measures. This research can delve into the unique needs and challenges of students with various disabilities and identify tailored safety solutions to address their specific requirements. In summary, these recommended studies aim to advance the knowledge and practices related to fire safety management in special needs schools. Each study will address specific aspects of safety management, from long-term impact assessments to technology integration and community engagement, ultimately contributing to the ongoing enhancement of safety measures and policies in these specialised educational institutions.

**Supplementary Materials:** The following supporting information can be downloaded at: <https://www.mdpi.com/article/10.3390/safety10020043/s1>.

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