

The Improvement of Fire Safety Awareness Management in Xinyue community, Shandong, China

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Abstract

The purpose of this study is to (1) analyze the current level of fire safety awareness among the management staff of the Xinyue community, (2) examine the factors influencing fire safety awareness in the community management, and (3) propose strategies to improve fire safety awareness and management levels among the community management staff. This research is a descriptive survey study. A questionnaire was used as the data collection tool. The target population consisted of 200 community management staff and residents of the Xinyue community in Shandong, China. Descriptive statistics, including percentages and means, were used for data analysis.

The findings of the study revealed that (1) the level of fire safety awareness among the management staff of the Xinyue community was found to be inadequate, with many respondents expressing dissatisfaction with the frequency of training and the maintenance of fire safety equipment, (2) the key factors affecting fire safety awareness include insufficient training, weak management systems, and a lack of effective fire prevention education, and (3) proposed improvements include strengthening fire safety education for residents, increasing regular publicity activities, and improving service quality and equipment inspections. The study suggests that continuous fire safety education and training should be implemented for both management staff and residents to enhance their fire prevention capabilities and reduce the risk of fire-related incidents in the future.

Keywords: Fire Safety; Management Awareness; Crescent Community

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Introduction

Fire safety is a fundamental aspect of urban management, particularly in high-density residential areas where fire risks are amplified due to population concentration, building structures, and human activities (Sun et al., 2020). Despite the existence of fire prevention regulations and emergency response measures, fire-related incidents remain a persistent threat to life and property. Many communities struggle with inadequate fire safety awareness, insufficient training, and ineffective management practices, all of which contribute to increased vulnerability in the event of a fire emergency (Zhang & Wang, 2019). Xinyue Community in Shandong serves as a representative case of these challenges. As an urban residential area, it faces significant fire risks due to rapid urbanization, complex residential structures, and diverse population demographics. Preliminary assessments indicate that many residents lack essential fire safety knowledge, have limited self-rescue skills, and rarely participate in fire drills. Additionally, there is a general dissatisfaction with the community's fire safety infrastructure, including the maintenance of fire equipment and the enforcement of fire safety policies. These gaps highlight the urgent need for a comprehensive study that addresses fire safety awareness and management deficiencies in Xinyue Community.

Guided by fire safety theory, new public service theory, and new public management theory (Denhardt & Denhardt, 2015), this study employs a systematic approach to assess fire safety awareness and management effectiveness. The research utilizes quantitative methodologies, including surveys and data analysis, to examine the key factors influencing fire preparedness, resident participation in fire safety initiatives, and the effectiveness of current fire management practices. Understanding these factors is crucial in developing targeted strategies that enhance fire safety awareness, strengthen community cooperation, and improve overall emergency preparedness. (Canton, 2019)

The findings reveal multiple shortcomings in Xinyue Community's fire safety management system. Firstly, a significant portion of residents demonstrates low awareness of fire hazards and emergency response procedures. This lack of awareness translates into minimal participation in fire drills and an underestimation of fire-related risks. Secondly, there are gaps in the implementation of fire safety policies and accountability measures among community managers, leading to

inconsistent enforcement of fire prevention protocols. Furthermore, inadequate inspection and maintenance of fire safety equipment create additional vulnerabilities, as malfunctioning or outdated fire extinguishers, smoke detectors, and emergency exits compromise the community's ability to respond effectively in case of fire incidents.

To address these issues, this research proposes several actionable recommendations. Optimizing fire safety training programs is a key strategy, ensuring that educational initiatives are practical, accessible, and engaging for all residents. Strengthening community collaboration by involving local government agencies, fire departments, and resident committees can facilitate better communication and coordination in fire safety management. Additionally, increasing transparency in fire safety policies and establishing a clear accountability framework will help foster a culture of responsibility among both residents and community administrators.

By implementing these strategies, Xinyue Community can significantly reduce fire-related risks, improve the safety and well-being of its residents, and serve as a model for other urban residential communities facing similar challenges. The broader implications of this study extend beyond Xinyue Community, offering valuable insights into best practices for fire safety management in high-density residential areas across China. With urbanization continuing at a rapid pace, proactive fire safety measures are essential to safeguarding communities and ensuring sustainable urban development.

Research Objectives

1. To analyze the fire awareness of Xinyue community management staff now.
2. To study the factors that affect the fire safety awareness of Xinyue community management.
3. To improve the Xinyue community improve the fire safety awareness and fire safety level of managers.

Research Methodology

1. Population and Sample Selection

This study employs a quantitative research approach to investigate fire safety awareness among residents of Xinyue Community, Shandong, China. The target population consists of permanent residents living in the community. A random sampling method was used to select a representative sample of 230 respondents, ensuring diversity in age, gender, and socio-economic background to capture a comprehensive understanding of fire safety awareness levels.

2. Research Instruments

To assess fire safety awareness and management effectiveness, a structured questionnaire was developed. The questionnaire consists of both closed-ended and Likert-scale questions, allowing for precise measurement and analysis. The Likert scale used in this study ranges from 1 to 5, representing different levels of fire safety awareness:

- 5 - Very Understanding
- 4 – Understanding
- 3 – Neutral
- 2 - Not Very Understanding
- 1 - Not at All Understanding

The questionnaire was pre-tested with a small sample (n=20) to ensure clarity, validity, and reliability before full-scale data collection.

3. Data Collection Process

Data were collected through face-to-face surveys conducted by trained investigators who guided participants in completing the questionnaire to minimize misunderstandings. To enhance data accuracy, external interference factors were strictly controlled, including providing a standardized explanation of terms and ensuring a quiet, non-disruptive environment for survey completion. Additionally, to increase response rates, participants were assured of confidentiality and anonymity, and their participation was entirely voluntary.

4. Data Analysis

After data collection, SPSS software was used for statistical analysis. The analysis process included:

1) Descriptive Statistics: Used to summarize the demographic characteristics of respondents and the overall level of fire safety awareness.

2) Frequency Distributions: To determine the proportion of residents at different levels of fire safety understanding.

3) Mean and Standard Deviation Analysis: To assess variations in awareness across different groups.

4) Correlation and Regression Analysis: To examine relationships between fire safety training participation, fire safety knowledge, and other influencing factors.

By applying these methods, this study aims to provide data-driven insights into the current state of fire safety awareness and propose practical recommendations to enhance fire safety management within the community.

Results

The researcher conducted a study on The Improvement of Fire Safety Awareness Management in Xinyue Community, Shandong, China and has summarized the findings in accordance with the research objectives as follows:

Objective 1: To analyze the current level of fire awareness among the management staff of the Xinyue community. This can be summarized in the following overview table:

Questionnaire content	Very satisfied	satisfied	Neither agree nor disagree	discontent	Very dissatisfied
1. Do you think the community management personnel regularly participate in the fire extinguisher extinguishing training?	6.96%	14.78%	44.35%	28.70%	5.22%
2. Do you think the residents of the community have the opportunity to participate in how to use fire extinguishers?	4.35%	14.78%	24.78%	47.83%	8.26%
3. What do you think of the sense of responsibility for fire safety issues?	11.30%	14.78%	18.70%	39.57%	15.65%

Questionnaire content	Very satisfied	satisfied	Neither agree nor disagree	discontent	Very dissatisfied
4. Do you think the management personnel take the initiative to check and maintain the fire extinguishers and fire hydrants?	8.26%	15.65%	33.04%	32.17%	10.87%
5. Do you think the fire access in the community is unimpeded?	12 (5.22%)	46 (20.00%)	63 (27.39%)	86 (37.39%)	23 (10.00%)
6. Do you think the fire fighting equipment in the community is regularly checked and maintained?	34 (14.78%)	52 (22.61%)	83 (36.09%)	56 (24.35%)	5 (2.17%)
7. Do you think there are regular fire drills in the community?	13.04%	17.83%	41.74%	23.91%	3.48%
8. Do you think that the fire safety training can effectively improve the fire prevention ability of the residents?	22.61%	41.30%	28.26%	6.09%	1.74%
9. Do you think education can improve residents' awareness of fire safety?	20.87%	26.96%	37.39%	9.13%	5.65%
10. Can regular fire safety publicity activities help to enhance residents' safety awareness?	28.26%	33.04%	30.87%	4.78%	3.04%

Table 1 Fire safety theory

Objective 2: To study the factors that influence the fire safety awareness of Xinyue community management. This can be summarized in the following overview table:

Questionnaire content	Very satisfied	satisfied	Neither agree nor disagree	discontent	Very dissatisfied
1. Do you think the residents of the community have the opportunity to participate in how to use fire extinguishers?	4.35%	14.78%	24.78%	47.83%	8.26%
2. Do you think there are any special fire safety management personnel in the community responsible for the daily management?	10.43%	34.35%	41.30%	11.30%	2.61%
3. Do you think the publicity can enhance the residents' awareness of fire safety?	15.65%	23.04%	26.96%	17.39%	16.96%
4. Do you think that strengthening the fire safety knowledge education for new residents can effectively improve their fire prevention ability?	33.48%	30.43%	28.26%	6.09%	1.74%

Table 2 New Public Service theory

Objective 3: To enhance the fire safety awareness and fire safety levels among the managers of the Xinyue community. This can be summarized in the following overview table:

Questionnaire content	Very satisfied	satisfied	Neither agree nor disagree	discontent	Very dissatisfied
1. Do you think the current community fire safety training content is detailed and practical enough?	14.78%	16.52%	24.78%	31.30%	12.61%
2. What do you think of the sense of responsibility for fire safety issues?	11.30%	14.78%	18.70%	39.57%	15.65%

Questionnaire content	Very satisfied	satisfied	Neither agree nor disagree	discontent	Very dissatisfied
3. Do you think the management personnel take the initiative to check and maintain the fire extinguishers and fire hydrants?	8.26%	15.65%	33.04%	32.17%	10.87%
4. Do you think the fire fighting equipment in the community is regularly checked and maintained?	14.78%	22.61%	36.09%	24.35%	2.17%
5. Do you think the fire management system can deal with the fire safety problems in time?	15.22%	17.39%	26.09%	39.13%	2.17%
6. Do you think the establishment of a sound management system can promote the improvement of fire safety management?	22.61%	31.30%	31.30%	10.00%	4.78%
7. Do you think strengthening the training and assessment of managers will help to improve the quality of management?	28.26%	30.43%	24.35%	11.30%	5.65%

Table 3 The New Public Administration Theory

According to the chart, the current situation of fire safety in Xinyue community is not good. Most of the people expressed dissatisfaction, 56.09% said that there was no opportunity to participate in the training, 55.22% said that managers have a low sense of responsibility for fire safety, 47.39% of the people have great concerns about the smooth situation of fire channels, 47.39% of the people said that the community has a big problem in the popularization of fire prevention knowledge of residents. People don't know how to prevent home fires.

The main factor affecting the fire safety awareness of Xinyue community is training, 63.91% of people think so, 61.30% of respondents think it is management system, 47.83% of respondents think it is education.

As for the best way to improve the fire safety awareness of the Crescent community, 63.91% of the respondents believe that the fire knowledge education of the residents should be strengthened, 61.30% of the respondents suggest strengthening "regular publicity", 56.96% of the respondents mentioned that "fire safety service quality" needs to be improved, and the frequency of fire protection facilities inspection and maintenance should be further improved. To ensure the integrity and effectiveness of the equipment, to ensure that the quality of service is fully guaranteed.

Discussion

The findings from this research on the Improvement of Fire Safety Awareness Management in Xinyue Community, Shandong, China reveal critical insights into the current state of fire safety management and the various factors influencing fire safety awareness within the community. The data obtained from the analysis of the management staff's awareness, factors affecting fire safety awareness, and potential strategies for improvement were consistent with previous studies and theories in fire safety management and public administration.

1. Analysis of Fire Awareness Among Management Staff

The first research objective aimed to analyze the current fire safety awareness among the management staff of Xinyue community. The survey revealed significant concerns about fire safety awareness. A large proportion of respondents indicated that the community management personnel did not regularly participate in fire extinguisher training, with 44.35% of respondents neither agreeing nor disagreeing with the notion that such training occurred regularly. Furthermore, 47.83% of respondents expressed dissatisfaction with the lack of opportunities for residents to engage in fire safety training. This result aligns with findings from earlier studies on fire safety training in urban communities, where a lack of structured training and public engagement was often linked to low levels of safety awareness (Kraus et al., 2017). The absence of consistent and accessible training programs for both management and residents significantly impairs the community's preparedness to handle fire emergencies effectively.

2. Factors Influencing Fire Safety Awareness

The second objective focused on identifying the factors that affect fire safety awareness in the community. The results suggest that training, management systems, and education are the key factors influencing fire safety awareness. Over 63% of respondents identified training as a crucial element, while 61.30% emphasized the importance of a well-structured management system, and 47.83% pointed to the role of education. This finding supports the conclusions of several studies in public administration and safety management, which argue that comprehensive training programs and a strong, coordinated management system are essential for enhancing safety awareness (Wang, 2018; Lee, 2020). These systems ensure that both the management staff and residents understand fire safety protocols, which can significantly reduce the risks associated with fire hazards. Furthermore, public education campaigns on fire prevention have been shown to effectively improve safety behavior and increase preparedness (Zhang et al., 2019).

3. Enhancing Fire Safety Awareness Among Managers

The third objective of the study examined strategies to enhance the fire safety awareness and management capabilities of the Xinyue community's leaders. The results indicated that strengthening fire safety knowledge education for residents was seen as the most effective measure, with 63.91% of respondents in favor of this approach. Additionally, respondents emphasized the need for more frequent fire safety publicity activities (61.30%) and improving the quality of fire safety services, including the regular inspection and maintenance of fire protection equipment. These findings correspond with the principles of the New Public Administration Theory, which emphasizes the importance of continuous public engagement and the quality of services provided by government agencies. This theory stresses the need for public institutions to be responsive and proactive in ensuring community safety, particularly in the context of fire hazards (Osborne, 2010). Ensuring that fire safety equipment is regularly inspected and that residents are educated about fire risks are both fundamental to creating a safer community environment. Moreover, the importance of proactive public safety management is further highlighted in studies by Jones (2015), who advocates for a systems

approach to fire safety, where regular training, management responsibility, and community participation are prioritized to ensure comprehensive risk mitigation.

The results of this study underscore the importance of a multi-faceted approach to improving fire safety awareness in Xinyue community. Strengthening fire safety training for both management staff and residents, improving the management system, and enhancing public education efforts on fire prevention were identified as key strategies for improvement. By integrating these strategies, the community can improve its readiness to prevent and respond to fire emergencies, ultimately reducing the risks associated with fire hazards. The study also reinforces the relevance of fire safety education and public administration theories in shaping effective community fire safety policies. Further research could explore the long-term effects of implementing these strategies and assess their impact on fire safety outcomes across similar communities.

New Knowledge

The research on improving the fire safety awareness of Xinyue community aims to enhance the residents' cognition and coping ability to the fire risk and build an efficient community fire management system. Through the improvement of facilities, training, publicity and practice, the overall safety level of the community has not only been improved, but also a replicable community fire management experience has been formed. The research results help to reduce the fire incidence, improve the quality of life of residents, and provide effective reference and solutions for other communities to enhance the awareness of fire safety.

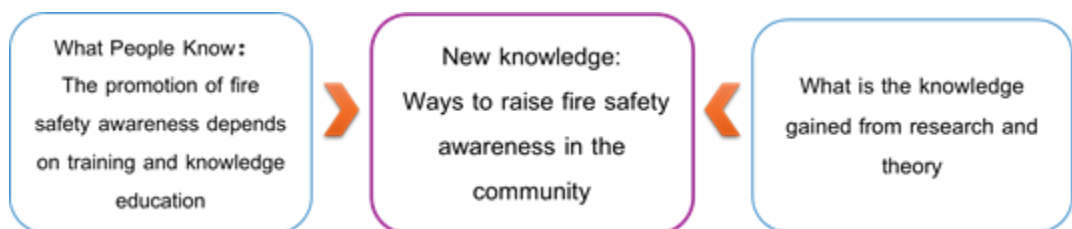


Figure 1 New Knowledge

Conclusion and Suggestion

The study on fire safety awareness in the Xinyue community, Shandong, China, revealed that both community management staff and residents have a limited level of awareness regarding fire safety. The findings highlighted several issues: a lack of sufficient fire safety training, inadequate maintenance of fire safety equipment, and insufficient educational efforts on fire prevention. Most respondents expressed dissatisfaction with the current state of fire safety measures and emphasized the need for better training, more regular fire safety drills, and stronger community involvement in fire safety education.

Therefore, the researcher provides recommendations derived from the study, including practical recommendations and suggestions for future research.

1. Policy Recommendations:

1.1 Establish a comprehensive fire safety policy that mandates regular training programs for both management staff and residents, ensuring that everyone in the community is equipped with the necessary skills and knowledge to prevent and respond to fire emergencies.

1.2 Implement a community-wide fire safety awareness campaign, with a focus on integrating fire prevention education into local governance and policy frameworks.

1.3 Allocate adequate resources for the maintenance and regular inspection of fire safety equipment, including fire extinguishers and hydrants, to ensure their effectiveness in case of emergencies.

2. Practical Recommendations:

2.1 Organize regular fire drills and fire safety workshops for both community management personnel and residents to improve practical knowledge and skills in fire prevention and response.

2.2 Establish a dedicated fire safety management team responsible for monitoring and maintaining fire safety equipment, conducting training sessions, and ensuring that fire safety protocols are consistently followed.

2.3 Strengthen the fire safety training content to ensure it is both practical and detailed, covering various scenarios and equipping participants with the skills necessary for real-life situations.

3. Suggestions for Future Research:

3.1 Future studies could explore the long-term effectiveness of fire safety training programs on reducing fire incidents in residential communities.

3.2 Research could investigate the role of technology in enhancing fire safety awareness and response, such as the use of mobile apps or online platforms for fire safety education and emergency alerts.

3.3 A comparative study between different communities with varying levels of fire safety awareness could offer valuable insights into the factors that contribute to the effectiveness of fire safety programs in different contexts.

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