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Article

Volunteer Motivation in Firefighting Organisations: A Case of the Slovenian Firefighters Association

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Abstract: The aim of the study is to examine the motivations for joining the volunteer fire service and the role of fire brigade support and leadership in the decision of volunteer firefighters. Furthermore, the study aims to develop a framework that identifies the factors that lead them to consider leaving the association. A survey was conducted among volunteer firefighters from a selected association in Slovenia and the questionnaire was developed based on the existing literature. The study used descriptive statistics, t-tests, Spearman's rank correlation and binary logistic regression to test the hypotheses. The study shows that people who are attracted to high-risk and stressful environments are more likely to volunteer for the fire service. The enjoyment of adrenaline-driven activities decreases with age, indicating a shift in motivation. Support from the fire brigade and positive interpersonal relationships are important motivators for volunteering. The logistic regression model highlights the reasons for leaving the volunteer fire service and provides insights into the changing motivations and concerns of firefighters in different age groups. This study expands our understanding of volunteer motivation in the fire service and provides practical implications for improving recruitment and retention strategies. The framework developed in this study is a valuable tool for identifying at-risk volunteers and addressing the factors that may lead to their departure from the fire brigade.

Keywords: firefighter; fire service; leadership; motive; logistic regression model; volunteering

1. Introduction

Volunteers perform unpaid, non-compulsory work for the benefit of others. Volunteering, i.e. donating time without payment, benefits both the individual and society [1] and is defined as unpaid, non-profit work in the service of the common good [2]. A key characteristic of volunteering is its voluntary nature, which distinguishes it from other forms of work. Voluntary work not only helps others, but also complements the national system of paid work. According to [3], volunteering can be divided into serious volunteering (e.g. NGOs, associations) and occasional volunteering (e.g. helping a neighbour after a storm).

[4] cite several motivations for volunteering, including altruism, self-development, social connections or self-interest. The type and frequency of volunteering varies and is influenced by organisational culture, structure and support as well as personal skills and interests. Collective volunteering, they explain, emphasises community goals, a shared identity and a sense of duty, which often requires a long-term commitment. Personal motivations can change due to factors such as career changes, family demands or personal crises, and these changes influence whether someone pursues a community-orientated or individualistic role. Societal changes also have an impact on volunteering as they influence how people adapt to current circumstances.

Non-profit organisations and public institutions face the constant challenge of recruiting and retaining volunteers, especially in an environment where the number of volunteers is declining [5]. For example, volunteer firefighters play a crucial role, particularly in rural areas where professional fire service resources are limited [6]. However, many countries report a decline in the number of

volunteer firefighters, likely due to an ageing population, the migration of young people from rural areas and increasing work demands. Understanding the initial and ongoing motivation of volunteers is essential for effective recruitment and retention strategies [7]. Although there are few studies that systematically compare motivations for joining and retention in service, there is little research on how these factors vary by demographic or regional criteria [8]. Volunteer firefighting is an important part of hazard defence, especially in areas where there are few professional fire brigades. This task is particularly demanding due to the high risks and the often stressful environment and requires a high level of personal commitment and resilience from the volunteers.

In Slovenia, the Volunteering Act defines volunteering as an unpaid, socially useful activity that improves the quality of life of individuals and social groups and promotes a humane, just society. Slovenian volunteer firefighters, who are organised in associations, form the public fire brigade alongside a limited number of professional firefighters [9]. Given the demands of volunteer firefighting and social trends that could discourage participation, the question arises as to what motivates individuals to volunteer in this challenging context.

This article examines whether people who are attracted to a stressful and high-risk environment are more likely to volunteer for the fire service. It also examines whether the role, leadership and management practises of the fire service influence volunteers to consider leaving.

Using binary logistic regression, this study examines the key determinants of volunteer firefighters' consideration of leaving the association, filling a gap in our understanding of the specific factors that influence volunteer decision making in high-stress service roles. This study builds on the existing literature by examining volunteer motivation in high-risk environments and exploring the role of fire service-specific leadership and management practises. These findings contribute to targeted human resource strategies for volunteer firefighters and have implications for volunteer recruitment in similarly challenging contexts.

The next section provides a literature review, followed by the research methods and measures, research findings, discussion and conclusions.

2. A Literature Review and the Formulation of Hypotheses

Volunteer firefighting requires a high level of expertise, training and time commitment, which is often a challenge in recruiting and retaining members, especially in Slovenia, where many volunteers combine this task with other jobs. To effectively recruit new members, leaders need to understand the nuanced motivations that drive people to volunteer. These motivations are influenced by a complex interplay of personal, social and contextual factors.

Theories about volunteer motivation often fall into two main categories. The first focuses on personal motivations and emphasises the individual characteristics and subjective reasons for volunteering [1]. The second takes a rational perspective and analyses the cost-benefit calculation behind the decision to volunteer. Building on these foundations, [10] identified six main motivations in their functional theory: protection, altruistic values, helping others, career prospects, social connections and personal growth. Volunteers often balance these factors by combining their personal development with their desire to contribute.

Socioemotional Selectivity Theory [11] adds an age-related dimension, showing that older people favour emotional connections and well-being, leading to motivations such as protection and enhancement. Similarly, [12] proposed a three-stage model that includes the pre-volunteering period (influenced by values and social networks), active participation (driven by personal growth) and individual change (focusing on skill development and mutual benefit). These theories are consistent with findings on volunteer firefighters, whose motivations include altruism, self-esteem, tradition, and risk tolerance [13,14].

The decision to become a volunteer firefighter is influenced by a combination of personal, social and contextual factors. Altruism, self-esteem and a strong desire to help others are important motivators, as are social elements such as family traditions [13]. The unique challenges and risks associated with firefighting – from physical danger to the emotional strain of life-and-death situations

– emphasise the importance of understanding the motivations behind this demanding task. For many, saving lives and protecting property is a compelling sense of purpose and fulfilment [14].

The differences between generations illustrate how motivations change over time. While both younger and older volunteers share a strong commitment to their community, younger individuals often prioritise their professional development and personal success, balancing these goals with their overall pursuit of growth and balance [15]. A high tolerance for risk and the ability to find fulfilment in dealing with stress characterise those who excel in this area, fostering both competence and commitment [4].

In addition to individual motivations, the social environment is also a decisive factor for commitment. Family influence, camaraderie and direct invitations from peers have been identified as important drivers of participation, reflecting the importance of relational ties in recruitment and retention [16]. For women, encouragement from family is particularly important, emphasising the need for tailored, informal recruitment strategies. Volunteers from rural areas, on the other hand, often emphasise the needs of their communities, which shows how the local context influences individual motivations. Across all demographic groups, skill development and a sense of belonging emerge as universal motivators, while a willingness to take risks and contribute to the community reinforces commitment in such a demanding role [17].

Given that the personal challenges and risks associated with firefighting are emphasised as key motivators for high-risk volunteering, we hypothesise that risk tolerance is the most important motivator for volunteering *H1: People who volunteer with the fire service tend to enjoy working in an environment associated with stress and controlled risk.*

The decision to become a volunteer firefighter is significantly influenced by the social environment, with the opinion and support of partners, family and friends playing a central role. Research emphasises the importance of these relationships, as family-related challenges can lead to volunteer attrition [18], while strong bonds encourage sustained commitment to the task [19]. Relatives and close social ties not only shape initial decisions, but also support commitment over time. For many, volunteering is an opportunity to express personal values and acquire new skills, with both family influence and friendships within the fire brigade serving as important motivators [20].

Gender differences make this dynamic even more complex. Women often cite altruism and relational factors such as family encouragement and community connections as crucial factors. Men, on the other hand, are more motivated by skill acquisition and the adventure associated with rescue work. These differences illustrate how personal needs intersect with social contexts to create different motivational pathways [4]. While women often prioritise community-oriented goals, men tend to focus on career development and the challenges of risk-taking [17]. [21] found that women specifically spoke of the fire service as a channel through which they can exercise compassion. [20] found that female volunteers are more likely to value social connections, while men are slightly more likely to value opportunities that express important values (value functions). The interplay of functional motives and social networks is not only important for attracting volunteers, but also for retaining them. Strong interpersonal bonds within the fire brigade, a sense of belonging and a supportive community environment enable volunteers to cope with the inherent risks and stresses of firefighting [10]. This combination of self-interest, altruism and social bonds forms the basis for sustained commitment to such demanding tasks.

Based on these findings, the following hypothesis was developed *H2: There is a difference in the motivational factors that drive male and female volunteer firefighters, with women being more motivated by altruism and social relationships and men by adventure and career development.*

Volunteer retention in the fire service is closely linked to the interplay of initial motivations, community ties and shared social expectations. [5] emphasise that these factors not only determine commitment, but also require tailored strategies to meet the different needs of volunteers. Similarly, [16] identify social bonding and shared values as central elements in sustaining volunteer commitment and emphasise their role in coping with the risky and demanding nature of firefighting.

The sense of connectedness within the fire brigade becomes a cornerstone for sustained engagement as it provides the emotional and social support necessary to overcome the challenges associated with the role.

Based on these findings, the following hypothesis 3 was developed H₃: Support from the fire brigade and current members is a stronger motivator for joining the fire brigade than other motivating factors.

Understanding the factors that influence volunteer firefighter satisfaction is critical to building strong teams and reducing turnover. Key predictors of retention include emotional exhaustion, which decreases retention, while organisational commitment and role identity increase retention [22], as well as age-related factors such as physical limitations, which can also lead to lower retention [23,24]. Retention strategies for senior volunteers include support and scholarships [25]. Leaders should recognise individual motivations and values as transformational leadership has a major impact on engagement [19,26]. Effective recruitment, training and motivational strategies are critical to prevent complacency [27].

Research also highlights the importance of strong relationships, effective leadership and a positive organisational climate. According to [15], supportive peer networks create a sense of belonging that is particularly valued by younger volunteers. Leaders who provide guidance and recognition promote higher levels of satisfaction, while an environment centred on teamwork strengthens overall commitment. Studies by [5] emphasise the role of camaraderie, social bonds and leadership support in increasing volunteer engagement. These factors, alongside training and recognition, contribute to a positive organisational climate that promotes motivation and reduces turnover. [16] add that camaraderie and belonging are crucial for building trust and confidence, which are essential for managing the risks associated with firefighting.

Based on these findings, the following hypothesis was developed H₄: *Volunteer firefighters who perceive stronger interpersonal relationships, appropriate leadership, and positive organizational climate report higher levels of motivation.*

Studies on the motivation of volunteer firefighters point to remarkable age-related differences. [28] found that younger volunteers are often driven by self-related benefits, although the shared commitment to safety and service to the community transcends age. Similarly, studies by [19,29] have identified community, commitment and altruism as universal motivators. Despite these commonalities, social ties play a particularly important role in retention, while the reasons for leaving service vary by age group. Younger volunteers often leave service due to career changes or waning enthusiasm, while older volunteers are more likely to leave due to physical limitations or family commitments [28,30,31].

The generational perspective also illustrates these differences. [15] found that New Generation volunteers are attracted by the excitement and opportunities for personal development, while Traditional Generation volunteers prioritise community service and social relationships. This evolution of motivation over time, from initial enjoyment to deeper organisational and social engagement, was echoed by [5]. [4,17] support these findings, emphasising the enthusiasm of younger volunteers and the stability of older volunteers. These shifts emphasise the importance of recruitment and retention strategies tailored to generational needs, such as mentoring roles for older members. Across all age groups, social connections and shared values serve as important motivators, with younger members valuing social connections particularly highly. This emphasises the need for a fire brigade environment that fosters a strong sense of community and belonging and is tailored to the specific preferences of different age groups.

Based on this understanding, the following hypothesis was formulated H₅: *The reasons for participating in a volunteer fire brigade are related to age: Younger members of a volunteer fire brigade are more motivated by adrenaline-driven activities, working with equipment, and active firefighting tasks, whereas older members are more influenced by social factors and decision-making processes.*

In addition to previous research, the present study focused on the factors that influence whether an individual volunteer firefighter considers leaving the association. A binary logistic regression

model was created for this purpose. Therefore, hypothesis 6 was analysed *H₆: Volunteer firefighters' intention to leave the fire service is influenced by leadership style and motivational factors: Volunteer firefighters are more likely to leave the fire service when their leader solves problems independently and when they are motivated by higher social status. Conversely, they are less likely to leave when they cooperate with the leader on decisions and find motivation in training exercises.*

In order to understand the specifics of Slovenian fire brigades, the following section describes the role of volunteer fire brigades in Slovenia.

3. The role of Volunteer Fire Brigades in Slovenia

Volunteering plays a crucial role in promoting solidarity, integration and active participation in Slovenia [32]. In 2018, the Slovenian government adopted a strategy for the development of non-governmental organisations and volunteering, which emphasises the role of organised volunteering in addressing community needs, promoting social cohesion and increasing well-being. According to the strategy: "Volunteering promotes skills development, strengthens community networks, supports youth development and adapts to social change" [33].

The Slovenian civil defence system, which is regulated by both the state and the municipalities, is governed by the Act on Protection against Natural and Other Disasters. This act aims to prevent and mitigate the effects of disasters on people, animals, property and the environment. The system includes voluntary, professional and civil defence units that provide first aid, firefighting and emergency assistance. In addition, civil defence, fire brigades, the police, the Slovenian Armed Forces and social services contribute through specialised units [9]. In Slovenia, firefighting is the core service within the framework of protection, rescue and civil protection, which is organised as a public service in all municipalities with the support of the state and the local level [34]. Firefighters, both volunteer and professional, respond to emergencies, including fires, accidents and natural disasters. Volunteer fire brigades focus on protection, prevention and cooperation within the framework of the Slovenian Fire Brigade Association [35]. These fire brigades are financed from the state budget, insurance premiums, donations and membership fees and receive additional support from the Fire Brigade Fund for equipment and vehicles. Fire brigades in Slovenia operate on the basis of laws that regulate their organisation, tasks and responsibilities, such as the Fire Brigades Act and the Fire Protection Act.

To join a volunteer fire brigade, applicants must submit an application to the board, agree to abide by the statutes and pay membership fees. Membership is possible from the age of 7, although parental consent is required for those under the age of 15. However, convictions for offences against life, physical integrity or property exclude applicants. Membership can be terminated by resignation, expulsion or dissolution of the brigade. Members have certain rights, including the right to vote from the age of 15, the right to take on leadership roles from the age of 18, to take part in events, to wear uniforms and to receive honours. Their duties include abiding by brigade rules, paying dues, passing required tests, mentoring younger members, and upholding the brigade's reputation [36].

[36] define the role, position and tasks of young members in firefighting organisations and are in line with the Statute of the Firefighters' Association of Slovenia. These rules emphasise the importance of youth in volunteer fire brigades in order to ensure their development and the continuation of their voluntary and humanitarian mission. Youth is represented in the Firefighters Association of Slovenia by elected delegates from each firefighting region. A youth representative also sits on the board of the Slovenian Firefighters' Association, which is responsible for overseeing youth activities.

As part of activities to integrate young people into the fire service at an early age, firefighters' associations work with primary schools to encourage the establishment and operation of "Young Firefighter Association" clubs (they can start in Year 1 – at the age of 6), namely to familiarise children with the work of the firefighting organisation and encourage them to become members of the volunteer fire service. The young volunteers are guided by qualified mentors. They are obliged to take part in annual exercises or competitions in accordance with the work programme and

regulations. The youth commissions also organise social and educational events such as quiz games, orientation competitions and Young Firefighter Society meetings.

The research measures and methods as well as the results are presented in the following two sections.

4. Research Measures and Methods

4.1. Participants

A total of 244 volunteer firefighters aged 18 years or older (out of 355 who started the survey) answered all questions, so 244 respondents were included in the analysis. Of the respondents, 21.4% were female and 78.6% were male. In terms of age, 9.9% were under 20 years old, 14.5% were between 21 and 30 years old, 26.0% were between 31 and 40 years old, 27.5% were between 41 and 50 years old, 13.0% were between 51 and 60 years old and the fewest participants were over 60 years old (9.1%).

4.2. Measures (Survey Items)

The questionnaire was developed based on validated measures from previous research, including [5,10,13,14,19,26]. It consisted of three sections: demographic information, general motivations for volunteering, and motivations and experiences specific to the volunteer fire service.

In the first section, *demographic* data was collected, including age, gender, years of service and function in the fire service.

Motivation for volunteering was assessed using a 5-point Likert scale from 1 ("not at all important") to 5 ("very important"). Participants rated the importance of various factors that influence their decision to volunteer, such as family, friends, connections to the fire brigade, personal growth, and service to the community. These items were adapted from [5,10], who studied functional motivations for volunteering.

To explore the structure of volunteer firefighter motivation, Cronbach's alpha was calculated for selected factors (adopted from [5,10]) for internal consistency. According to the literature review, we grouped 11 motivational factors into three dimensions:

- **Thrill and operational engagement** – items included *adrenaline*, *interventions*, and *working with equipment (tools, vehicles, etc.)*. A Cronbach's alpha of 0.744 indicates acceptable reliability.
- **Community and social ties** – Items included *service to the local community*, *grateful people*, *friendship/fellowship*, and *higher status in society*. This dimension had a Cronbach's alpha of 0.516, indicating poor internal consistency.
- **Personal development and responsibilities** – items included *staying in shape*, *exercises*, *this is the only thing I am good at*, and *administrative tasks*. The Cronbach's alpha of 0.723 indicates acceptable reliability.

While these reliability estimates provided an insight into the internal consistency of the dimensions, the individual items were analysed separately in further analyses. Given the multidimensional nature of volunteer motivation and the conceptual specificity of specific motivational factors, analysing individual items allowed for a more nuanced examination of their individual impact. This approach ensured that important aspects of volunteer motivation were not obscured by aggregated composite scores.

To measure *thrill and stress-related enjoyment* (whether volunteer firefighters were motivated by *working in a high stress, controlled-risk environment*), respondents rated their agreement with statements such as *"I enjoy adrenaline-driven activities that involve risk," "I enjoy adrenaline-driven activities that involve danger,"* and *"I prefer to function under pressure and perform well in stressful situations."* Responses were recorded on a 5-point Likert scale from 1 ("strongly disagree") to 5 ("strongly agree").

A reliability analysis of this measurement resulted in a Cronbach's alpha of 0.859, which indicates high internal consistency. Despite this high reliability, the individual items were analysed separately in further analyses to capture the unique contribution of each aspect of thrill-seeking and stress-related enjoyment. These items were adopted from previous research on risk-taking behaviour and motivation of volunteers [13,26].

To examine *organisational and social Influences* (the role of interpersonal relationships, leadership qualities and organisational climate on motivation), participants rated their agreement with statements about *service to the community, camaraderie, physical fitness, social status, and administrative tasks*. Ratings were made on a 5-point Likert scale (1 = "strongly disagree," 5 = "strongly agree"). These items were based on previous studies [14] to explore volunteers' attention to leave the association and group cohesion. In order to capture the specific influences of the individual factors, further analyses were conducted at the item level rather than using composite scores.

The *leadership-related items* were not categorised into dimensions. Instead, their internal consistency was assessed separately. The Cronbach's alpha for all five leadership items was 0.823, which indicates a high level of reliability. However, as with the motivational factors, the individual leadership items were analysed separately to enable a more detailed examination of their specific effects.

Participants also identified *potential reasons for leaving the fire service*, selecting from options such as *time commitments, conflicts between members, health concerns, limited training opportunities, and inadequate protective equipment*. These variables were treated as binary (1 = reason selected, 0 = reason not selected), meaning no internal consistency analysis (e.g., Cronbach's alpha) was conducted for this measure.

Analyses of *internal reliability and validity* was carried out for each scale. Despite the calculation of Cronbach's alpha, the individual items were analysed separately in the main analyses. This decision was made to preserve the specificity of each motivation and leadership factor and to ensure their different contributions to the motivation and experiences of firefighters were not lost through aggregation.

4.3. Procedure

Before the survey began, the management of the selected fire brigade association from a Slovenian region was asked to agree to the survey being carried out in all 22 volunteer fire brigades. The association was selected based on the number of volunteer firefighters over the age of 18 (1,768), the structure of the volunteer firefighters, as it should also include volunteer firefighters from semi-rural, rural regions, and the willingness of the associations to participate in the survey. The fire service management reviewed the questionnaire and agreed to conduct the survey.

The survey was conducted in January 2024. An e-mail with the link to the questionnaire was sent to the heads of all 22 volunteer fire services, asking them to forward the link to volunteer firefighters over the age of 18. One limitation of the study was the online survey, which could affect the response rate among older volunteer firefighters. The researchers also did not know if the recipients had actually forwarded the link to all volunteer firefighters, and due to the anonymity of the survey, it was not possible to determine an exact response rate. Based on the number of firefighters in the selected association, the estimated response rate was around 14%. The sample was representative in terms of gender and age. SPSS 25.0, sklearn [37,38] were used for data analysis and statistical processing. In addition, not all volunteer firefighters completed the survey.

5. Results

5.1. Testing the Hypothesis H₁

Hypothesis H₁: People who volunteer with the fire service tend to enjoy working in an environment associated with stress and controlled risk was tested using a binomial test with a test value of 0.5 (50.0%). The results indicate that 45% of respondents agreed (value 4), and 15.6% strongly agreed (value 5) that they enjoy working in high-stress and controlled risk environments. In contrast, 14.7% disagreed (value 2), and 0.9% strongly disagreed (value 1), while 23.9% were neutral (value 3) regarding this aspect of their work. These results show that more than 50% of participants agreed with the statement that they enjoy adrenaline-driven activities that involve risk (64.1%; $p=0.002$) and prefer to work under pressure and perform well in stressful situations (63.4%; $p=0.003$). However, less than 50% of participants agreed with the statement that they like adrenaline-driven activities that involve danger (48.1%; $p=0.727$).

5.2. Testing the Hypothesis H₂

Hypothesis H₂: There is a difference in the motivational factors that drive male and female volunteer firefighters, with women being more motivated by altruism and social relationships and men by adventure and career development, was further analysed. The differences in motivational factors between male and female volunteer firefighters were analysed using the Mann-Whitney U-test due to the non-normal distribution of the data (motivational factors).

Although the Mann-Whitney U-test works with ranks and not with raw data, mean values were given for both groups for descriptive purposes. Mean scores provide a more intuitive and interpretable measure of central tendency and allow for easier comparison of motivational levels between men and women. This approach helps to visualise the extent of the differences and complements the statistical significance resulting from the Mann-Whitney U-test.

Table 1. Differences in motivational factors between men and women in different dimensions.

	SLC	IN	F/F	E	TP	AD	SIS	HSS	GA	AT	WWE
Mean for men	4.07	4.33	4.56	4.15	4.45	3.96	3.93	2.96	2.42	2.67	4.30
Mean for women	4.00	3.87	4.61	3.78	4.39	3.39	3.74	2.65	2.39	2.59	3.35
Mann-Whitney U	911	667.5	941.5	723.5	887	662	893	801.5	975.5	893.5	494
Asym. Sig. (2-tailed)	0.58	0.01	0.75	0.03	0.45	0.01	0.49	0.20	0.99	0.74	<0.001

Legends: SLC = Serving the local community; IN = Interventions; F/C = Friendship/fellowship; E = Exercises; TP = Thankful people; AD = Adrenaline; SIS = Stay in shape; HSS = Higher status in society; GA = This is the only thing I am good at; AT = Administrative tasks; WWE = Working with equipment (tools, vehicles, etc.). Source: Own.

The results show gender-specific differences in the motivational factors of volunteer firefighters. On average, men showed a significantly higher interest in interventions (4.33 vs. 3.87, $p = 0.01$), physical activity (4.15 vs. 3.78, $p = 0.028$), adrenaline-driven activities (3.96 vs. 3.39, $p = 0.013$) and working with equipment (4.30 vs. 3.35, $p < 0.001$). These findings are consistent with established research suggesting that male volunteers are often attracted to firefighting by the excitement, challenge, and skill development opportunities associated with emergency services.

Conversely, although the differences were not statistically significant, women showed slightly higher motivation in areas related to social bonding and friendship (4.61 vs. 4.56, $p = 0.753$). This suggests that while women participate in firefighting for altruistic reasons and a desire to form relationships, their motivation is not focussed on high adrenaline or high physical exertion activities to the same extent as men. These findings emphasise the need for recruitment and retention strategies that address gender-specific motivational factors and improve inclusivity and engagement in the volunteer fire service.

5.3. Testing the Hypothesis H₃

Hypothesis H₃: Support from the fire brigade and current members is a stronger motivator for joining the fire brigade than other motivating factors. This was tested using Repeated ANOVA and post-hoc test.

Table 2. ANOVA test.

	F Value	Num DF	Den DF	p-value
Condition	39.2621	5000	645.000	<0.001

Source: Own.

The results of the ANOVA test show that there are statistically significant differences between the motivating factors, with a p-value of less than 0.001.

After the significant overall effect observed in the ANOVA, a post hoc analysis was performed using Tukey's HSD test to determine which specific differences in motivating factors were significant. Missing values were replaced by the median. The table contains only the significant pairwise comparisons between the groups with p-values of less than 0.05.

Table 3. Post-hoc test.

Factor 1	Factor 2	Mean Difference	Adjusted p-value
Parents	Brigade	-0.592	<0.001
Partner	Brigade	-1.008	<0.001
Children	Brigade	-0.946	<0.001
Brigade	Current members	1.100	<0.001
Friends	Brigade	-0.554	<0.001
Friends	Current members	0.546	<0.001
Parents	Current members	0.508	<0.001
Partner	Friends	-0.454	0.0032
Parents	Partner	0.416	0.0098
Children	Friends	-0.392	0.0183
Parents	Children	0.354	0.0469

Source: Own.

The comparison groups highlight factors that influence the decision to volunteer for the fire service, focussing on social influences such as family, friends and the fire brigade. The table shows how different social groups (parents, partner, children, fire brigade, friends and current members) influence this decision. The "mean difference" indicates how much more or less influential one factor is compared to another, while the "adjusted p-value" indicates the statistical significance.

The fire brigade consistently exerts a strong influence on the decision to volunteer, which outweighs the other factors. For example, parents have a significantly lower influence than the fire brigade (mean difference = -0.5923, $p < 0.001$), as do the partner (mean difference = -1.0077, $p < 0.001$) and friends (mean difference = -0.5538, $p = 0.001$). This indicates that the role of the fire brigade is decisive for the decision to volunteer.

Interestingly, the current members of the fire brigade have an even stronger influence within the fire brigade than the fire brigade itself (mean difference = 1.1, $p < 0.001$). The influence of children does not differ significantly from that of current members (mean difference = 0.1538, $p = 0.8107$).

5.4. Testing the Hypothesis H_4

In order to test hypothesis H_4 which states that *Volunteer firefighters who perceive stronger interpersonal relationships, appropriate leadership, and positive organizational climate report higher levels of motivation*. Hypothesis H_4 was tested using a t-test on a sample with a test value of 3.5. The t-test was appropriate because the survey question directly asked respondents to assess how each of these factors increased their perceived motivation.

The survey contained questions designed to assess how interpersonal relationships, organisational climate and appropriate leadership influence the motivation to volunteer. To determine whether the average level of agreement for each factor was significantly higher than the mean of 3.5 (indicating general agreement), a t-test was conducted on a sample with a test value of 3.5.

A test value of 3.5 was chosen for the one-sample t-test because it represents the midpoint between "neutral" (3) and "agree" (4) on the 1 to 5 scale used in the survey. The choice of 3.5 as the

test value was intended to determine whether respondents on average agree or disagree with the influence of interpersonal relationships, organisational climate and appropriate leadership on their motivation to volunteer. In this way, it was possible to determine whether the respondents were statistically significantly more likely to agree with the positive influence of these factors than to be neutral or negative.

Table 4. One sample t-test (test value 3.5).

	t	df	p-value (1-tailed)	Average difference
interpersonal relationships	18.681	244	<0.001	1.077
organisational climate	14.428	244	<0.001	0.946
appropriate leadership	17.196	244	<0.001	1.015

Source: Own.

The results of the one-sample t-test show that the mean values of the factors interpersonal relationships, organisational climate and appropriate leadership are statistically significantly higher than 3.5. It is therefore concluded that interpersonal relationships, appropriate leadership and a positive organisational climate are factors that influence the higher motivation of volunteer firefighters.

5.5. Testing the Hypothesis H_5

Further analyses were conducted to examine the differences between younger and older volunteer firefighters, particularly concerning hypothesis H_5 : *The reasons for participating in a volunteer fire brigade are related to age: Younger members of a volunteer fire brigade are more motivated by adrenaline-driven activities, working with equipment, and active firefighting tasks, whereas older members are more influenced by social factors and decision-making processes.* The hypothesis states that the desire for adrenaline-driven activities decreases over time, that the main motivators for continued involvement change and that the reasons for leaving the fire brigade also vary with age.

To test this hypothesis, content variables were selected from five categories: Motivational factors, tasks in the fire service, adrenaline and stressful situations, motivators for continued engagement and reasons for leaving. For each category, Spearman's rank correlation coefficient with age and the corresponding p-value were calculated. The results presented focus on the content variables that showed statistically significant correlations with age ($\alpha=0.05$).

The results table shows the correlations between various motivational factors, tasks and reasons for leaving the volunteer fire service in relation to age. Only significant correlations are included, whereby the variables are organised according to their p-value for the sake of clarity.

Table 5. Spearman's rank correlation.

Set	Variable	Spearman rho	p-value
Adrenalin and Stressful Situations	I like adrenaline-driven activities that involve risk	-0.437	<0.001
Motivating factors	Adrenalin	-0.432	<0.001
Adrenalin and Stressful Situations	I like adrenaline-driven activities that involve danger	-0.390	<0.001
Motivating factors	Working with equipment (tools, vehicles...)	-0.341	<0.001
Firefighting tasks	Fire brigade interventions	-0.295	0.002
Motivating factors	Exercises	-0.282	0.003
Motivating people	Friends	-0.255	0.008

Reasons for leaving	Incompetent leadership	-0.529	0.017
Selected statements	When I solve problems, I consult with other members	0.236	0.018
Motivating people	Partner	0.215	0.027
Selected statements	I trust the decisions of the leader	-0.201	0.045
Reasons for leaving	Lack of exercises	-0.449	0.047
Reasons for leaving	Too few trainings	-0.449	0.047

Source: Own.

The strongest negative correlations were observed between age and enjoyment of adrenaline activities correlated with risk and danger, suggesting that older members tend to have less interest in high-risk, adrenaline-driven activities. Other notable negative correlations include a lower correlation with incompetent leadership ($\rho = -0.529$, $p = 0.017$) and the importance of adrenaline and working with equipment ($\rho = -0.431$, $p < 0.001$), suggesting that older members may favour stability and safety over these aspects.

Positive correlations, although weaker, are found with the importance of consulting other members in solving problems ($\rho = 0.236$, $p = 0.018$) and the role of a partner as a motivator, suggesting the kind of social and relational factors that become more significant with age. Confidence in leadership decisions shows a moderate but significant negative correlation ($\rho = 0.201$, $p = 0.045$), as does lack of practise and training, suggesting that older members may be more critical of insufficient training opportunities.

5.6. Testing the Hypothesis H_6

Further analysis focussed on the factors that influence whether an individual volunteer firefighter would consider leaving the association. For this purpose, a binary logistic regression was used with a dependent variable asking about this intention. H_6 : *Volunteer firefighters' intention to leave the fire service is influenced by leadership style and motivational factors: Volunteer firefighters are more likely to leave the fire service when their leader solves problems independently and when they are motivated by higher social status. Conversely, they are less likely to leave when they cooperate with the leader on decisions and find motivation in training exercises, was analysed.*

The independent variables were selected from three groups, namely the group relating to the incident leader's problem-solving approach, the group relating to statements about the leader, and the motivational factors for volunteer firefighters. Age was included in the model as a control variable. To identify a locally optimal subset of independent variables, we tested all possible combinations of independent variables. Due to the large number of possible subsets, we limited each set to a maximum of four independent variables to manage computational complexity and avoid excessive model complexity.

In addition, at least one variable from each content set had to be included. Two models were identified in which a significant effect was observed for at least three variables. The two models are very similar, so that model with the slightly higher pseudo R^2 ($=0.18$) was selected for presentation.

Table 6. Logistic Regression.

Variable	B	SE	Z	p-value
Intercept	4.013	2.500	1.605	0.108
Leader: Solves problems independently	1.328	0.663	2.004	0.045
Leader: Leave problem solving to other members	0.193	1.360	0.142	0.887
Leader: Also shares responsibility for completed tasks with subordinate members	0.261	0.379	0.689	0.491
Leader: I co-operate with the leader on decisions that affect my work	-1.129	0.506	-2.232	0.026

Motivation: Exercises	-0.953	0.418	-2.276	0.023
Motivation: Higher status in society	0.751	0.332	2.264	0.024
Motivation: This is the only thing I'm good at	-0.520	0.294	-1.769	0.077
Age	0.230	0.184	1.247	0.212

Source: Own.

Logistic regression analysis revealed that the perception that leaders solve problems independently rather than collaboratively is a strong predictor of firefighters considering leaving ($B=1.328$, $p=0.045$). A positive coefficient indicates that firefighters who observe or experience leaders solving problems alone without involving others are more likely to consider leaving the fire service. This could indicate that they prefer more inclusive or collaborative decision-making processes in the fire service, where input and co-operation are valued.

Conversely, co-operation with leaders in decision-making proved to be a protective factor against resignation ($B=-1.129$, $p=0.026$). Firefighters who felt they had a say in decisions affecting their work were significantly less likely to consider leaving the fire service. This emphasises the importance of participative leadership and the role of inclusivity in fostering a sense of commitment and engagement among volunteers. When firefighters feel that their contribution is valued and that they can participate in decisions that affect their work, they are more likely to remain engaged and committed to the fire service.

Motivational factors also played an important role in whether firefighters would consider leaving the fire service. Firefighters who were motivated by physical activity were less likely to consider leaving the fire service ($B=0.751$, $p=0.024$), suggesting that the physical aspect of the job contributes positively to their satisfaction and commitment. On the other hand, those who were motivated by a desire for higher social status were more likely to consider leaving the fire service, possibly indicating that they would look for other opportunities if the role did not fulfil their expectations of status ($B=-1.129$, $p=0.026$). These findings emphasise the importance of understanding and addressing the different motivations and preferences of volunteer firefighters in order to improve retention and engagement with the fire service.

The analysis showed that age was not a significant predictor of whether volunteer firefighters considered leaving ($B=0.230$, $p=0.212$). The coefficient for age was positive but not statistically significant, suggesting that there is no clear or consistent relationship between a firefighter's age and the likelihood that they would consider leaving the fire service. This suggests that factors other than age have a greater influence on whether a firefighter stays or leaves. In other words, younger and older firefighters are equally likely to stay or leave the fire service, and age alone is not a determining factor in the decision to stay or leave the fire service.

6. Discussion

This study deepens our understanding of the factors that influence the decision to join and stay in a volunteer fire service. The findings are consistent with the existing literature and provide important insights into the motivations and challenges of volunteer firefighters.

The results suggest that a significant number of participants are comfortable in high stress situations and enjoy the adrenaline-driven aspects of firefighting. This is consistent with the findings of [14,17] who observed that individuals who are attracted to adrenaline and challenge are often drawn to such environments. However, our study also shows that participants do not necessarily favour perceived danger, a finding that is consistent with Wilson's theory [1] on volunteering, which emphasises personality traits such as risk tolerance and stress management.

The study also examines how volunteer motivation evolves with age, particularly with regard to initial thrill-seeking, long-term engagement factors and reasons for leaving. The results suggest that members place more value on experience, relationships, and education as they age, which is

consistent with the observations of [28,30]. This shift supports [11] socio-emotional selectivity theory, which states that people prefer emotional fulfilment and close relationships as they age.

The study also analyses how the motivation of volunteers differs between the gender. Results show significant gender differences in the motivational factors that drive volunteer firefighters, which is consistent with the theoretical framework of [4,17]. Men are more likely to be motivated by adventure, personal development and commitment, while women are motivated by service to the community and social bonding. These findings emphasise the need for gender-specific recruitment and retention strategies in which fire services emphasise technical and adventurous aspects for men and teamwork and social engagement for women. Such customised approaches could foster an inclusive and supportive environment in the fire service.

Socioemotional Selectivity Theory [11] states that people prioritise emotional well-being and meaningful relationships as they age. This is consistent with the findings that older firefighters prioritise stability, safety and interpersonal relationships over adrenaline-driven activities. SST's focus on social factors is reflected in older firefighters' preference for collaborative decision making and inclusive leadership, which reduces the risk of resignation. Collaborative problem solving strengthens engagement, while lack of training or poor leadership fosters dissatisfaction. Although age is not a direct predictor of turnover, motivations associated with emotional and social goals better explain retention.

These findings highlight the influence of age and gender on volunteer motivation and emphasise the need for tailored leadership and engagement strategies that value inclusivity, collaboration and community relationships in the stressful context of firefighting. In addition, the correlation analysis shows that interest in high-risk, adrenaline-driven tasks decreases with age, while older members value social and relational factors such as teamwork and support from partners. This aligns with the findings of [20], who emphasise the role of social relationships in volunteer recruitment, and contrasts with [16], who highlight skills development and camaraderie as the main motive for joining.

The study highlights the influence of organisational climate and internal support on volunteer motivation, as well as the importance of leadership in creating a supportive environment. These findings align with research by [19,27] on the role of leadership in volunteer retention. [15] also found that strong interpersonal relationships and effective leadership increase satisfaction, with younger volunteers particularly valuing a sense of belonging and a teamwork-focused environment that encourages engagement.

The logistic regression analysis showed that leadership style was a significant predictor of resignation. Leaders who involve others in decision-making strengthen volunteer engagement, while an autocratic approach correlates with a higher likelihood of volunteers leaving the organisation. These findings are in line with [19,29], who emphasise the importance of community engagement. Research by [15,17] emphasise the role of thrill, community and social connectedness in maintaining engagement, while [4,5] support the notion that motivations change with age.

Recognising these changes can help in the development of recruitment and retention strategies, e.g. by involving older members in mentoring roles. [16] found gender differences in motivation, with female volunteers citing social factors and male volunteers emphasising values, suggesting the need for age- and gender-specific strategies to promote a socially connected, inclusive fire service.

The results emphasise that transformational leadership is critical for volunteer fire services to address the unique challenges in high-risk situations. Transformational leaders promote inclusivity and a positive organisational climate, which is critical for recruiting and retention of members. A lack of effective leadership can make it difficult to retain volunteer in the organisation. However, by showing appreciation and respect for volunteers, leaders can strengthen bonds, bridge gaps and improve engagement. Simple gestures, autonomy and shared decision-making increase volunteer motivation and feelings of value. Other positive leadership styles that were not examined in this study can also be effective in certain situations. For example: Transformational leadership (a leader motivates volunteers by emphasising their role in community safety and encouraging their professional development through training), Servant leadership (a leader ensures that volunteers

receive appropriate training, listens to feedback and implements necessary changes), Democratic (participative) leadership (a leader holds regular meetings to discuss strategies, gather input and implement suggestions), Authentic leadership (a leader openly discusses challenges, seeks honest feedback and makes ethical, team-oriented decisions).

As fire services adapt to modern, flexible approaches to volunteering, they must address changing societal expectations where free time is increasingly competitive. Leaders must maintain a supportive environment that encourages engagement and quality at all levels of the organisation, which requires sustained effort to maintain a positive climate.

This study makes several new contributions to the understanding of volunteer firefighters. A new questionnaire was developed based on findings from the scientific literature. The study uniquely combines research on personal motivations with the specific context of a high-stress environment such as the fire service. Using a binary logistic regression analysis, the study identifies the key determinants of volunteer firefighter retention, filling an important gap in the existing literature. These findings contribute to the theory of volunteer motivation and have significant implications for recruitment and retention strategies in fire service organisations. Furthermore, this study builds on the existing literature by examining volunteer motivation in high-risk environments and exploring the impact of fire service-specific leadership and management practises. From a scientific perspective, it advances the theoretical understanding of volunteering by integrating the theory of functional motivation and the socioemotional selectivity theory. The study provides empirical evidence that personal motivations are shaped by both individual characteristics and the organisational environment. This dual approach enriches the literature on volunteering and provides a basis for future research.

In practise, the results of this study have significant implications for fire service management and human resource strategies. By identifying key factors that influence volunteer motivation and resignation, fire service organisations can develop targeted volunteer recruitment and retention strategies that are aligned with their motivation. Improving leadership practises and fostering a supportive organisational climate can improve volunteer satisfaction and engagement, which ultimately leads to better service delivery in emergency situations.

Strong leadership and positive interpersonal relationships are essential to sustaining volunteer engagement, and a supportive organisational climate further strengthens this engagement. Understanding the different motivations and challenges faced by volunteers enables organisations to better tailor their approaches to the needs of members, leading to more effective and committed volunteering.

These findings support targeted recruitment strategies for volunteer firefighters and have wider implications for the recruitment of volunteers in similarly challenging contexts. Fire services should consider implementing training programmes or leadership development initiatives. This research also highlights the crucial but under-researched role of leadership and management practises in influencing volunteer satisfaction and retention.

Despite its contributions, this study has several limitations. One notable limitation is the reliance on an online survey. In addition, the anonymity of the survey limited the researchers' ability to accurately track the response rate, which may have skewed the data. Furthermore, the study was conducted in a specific geographical context (Slovenia), which could limit the generalisability of the results to other regions or countries with different cultural or organisational dynamics among volunteer fire services.

Future research could extend this study by exploring the motivations and retention factors of volunteer firefighters in different cultural contexts. Longitudinal studies could shed light on how motivations evolve over time and evaluate the effectiveness of specific interventions to improve retention in volunteer fire services. In addition, qualitative methods such as interviews or focus groups could provide deeper insights into the personal experiences of volunteer firefighters, particularly in relation to leadership and organisational climate.

7. Conclusions

The study provides valuable insights to improve the recruitment and retention of volunteer firefighters by enhancing our understanding of the factors that motivate individuals to join and remain in the volunteer fire service. In line with the existing literature, the study sheds light on the complex motivations and challenges that volunteer firefighters face.

The main findings suggest that individuals who favour controlled risk and stressful environment are more likely to volunteer with the fire service. In addition, support from the fire brigade and current members is an important motivating factor, while dissatisfaction with leadership is the main reason for leaving the service. These results underline the important role of a positive organisational climate and effective leadership in retaining volunteers.

The study also shows how motivations change with age. Older volunteers value safety, stability and social relationships, while younger members are driven by the thrill of high-risk tasks. Leadership style is an important predictor of resignation. This emphasises the importance of transformational leadership, inclusive decision-making and recognising the contributions of volunteers. To maintain volunteer engagement in the future, it is important to focus on strong leadership, a positive organisational climate and supportive interpersonal relationships.

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