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Exposure to Occupational Risks in a Portuguese Care-home for Elderly People: A Case Study

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Abstract: Residential Structures for the Elderly People (care homes) play an essential role in the social response to support aging populations, reflecting the growing rate of aging in Portugal. These services are carried out by people in different, specific professional categories exposed to labour risks that affect the workers' physical, mental, and social health. Analysing and assessing the risks inherent in the various jobs is key to controlling them and preventing accidents and occupational illnesses. This study involves analysing the risks to which workers in a care home are exposed and, consequently, the preventive measures best suited to eliminating and controlling risks. The methodology involves the application of a questionnaire drawn up based on bibliographical research duly adjusted for the different professional categories. Subsequently, through non-participant observation, the existing risks were surveyed and evaluated, with the other sources of information being duly considered. The results show the need for specific training for the organization's employees and the implementation of lesser-used preventive measures, which require more significant investment and support for their application in similar care-home institutions.

Keywords: Safety, risks, care homes, prevention, preventive measures.

Exposição a Riscos Ocupacionais numa Estrutura Residencial Portuguesa para Pessoas Idosas: Um Estudo de Caso

Resumo: As Estruturas Residenciais para Pessoas Idosas (ERPI) têm um papel importante na resposta social de apoio às populações mais envelhecidas, reflexo do crescente índice de envelhecimento em Portugal. Esses serviços são realizados por pessoas distribuídas por diferentes categorias profissionais mais específicas, expostas a riscos laborais que afetam a saúde física, mental e social dos diferentes trabalhadores. O levantamento dos riscos inerentes nos diversos postos de trabalhos, através da análise e avaliação de riscos, tem um papel preponderante no controlo dos mesmos e na prevenção de acidentes de trabalho e de doenças profissionais.
Este estudo envolve o levantamento de riscos a que os trabalhadores de uma ERPI estão expostos e às medidas preventivas mais ajustadas à eliminação e controlo de riscos. A metodologia envolve a aplicação de um questionário elaborado a partir de pesquisa bibliográfica, devidamente ajustado para as diferentes categorias profissionais. Posteriormente, através de observação não participante procedeu-se ao levantamento dos riscos existentes e à sua avaliação, sendo as diferentes fontes de informação devidamente ponderadas. Os resultados permitem aferir a necessidade de formação específica dirigida aos trabalhadores da organização e a necessidade de implementação de medidas preventivas menos utilizadas, que exigem maior investimento, mas que em conjunto servem de exemplo para aplicação noutras instituições similares.

Palavras-chave: Segurança, riscos, ERPI, prevenção, medidas preventivas.

1. Introduction

The aging population in Portugal has been increasing considerably, reflecting the improvement in the population's living and health conditions and the consecutive decrease in the birth rate. The increase in older people with reduced dependence, together with changes in the family structure of these people, translates into the indispensable use of specialized care and services for a long time. Families are looking for appropriate care solutions, provided by social responses, with the most frequent situation being the Residential Structures for the Elderly People (care homes), requiring professionals in different professional categories and offering various complementary services. However, workers in these places are exposed to a range of occupational risks, which translates into consequences that affect them personally, the health and lives of their family members, and their safety in the exercise of their profession. These risks encompass physical, biological, chemical, psychosocial, organizational, and ergonomic conditions, which, if lacking, can affect their health through occupational diseases, injuries, and even work-related accidents (Law No. 98/2009). According to Olson et al. (2014), in a study developed within the scope of the validity of the STAT (Safety Task Assessment Tool), it was found that exposure to similar tasks in the care home was related to daily fatigue and/or pain. In turn, the daily stress of workers fostered the excessive consumption of high-calorie snacks, so exposure to risks in this sector can trigger other undesirable health consequences.

This paper aims to highlight the present risks arising from the work developed by several professionals in a care home and the perception of risk by the workers of the different professional categories, including a later assessment of the present hazards. The identification of dangerous situations at work was detected, so continuous and systematic training and frequent inspection have to be considered as the primary prevention measures, as well as the need for more investment in equipment for moving bedridden people or people with reduced mobility. In addition, other resources are missing but extremely necessary, proposing in the study a set of possible solutions and reflections for the thematic context from the perspective of the safety and defence of workers who work in these organizations. The paper is structured into five sections: Introduction; Theoretical context of the theme; Research methodology; Results and recommendations; and Main conclusions.

2. Theoretical context of thematic framework

2.1. Ageing and social response

Aging brings physical, psychological, and social changes that affect older people's quality of life (Oliveira et al., 2021). It is linked to retirement, family changes, chronic diseases, and loss of independence in daily activities (Oliveira, 2021; Rocha, 2018).

Various social responses, publicly or privately funded, support older adults considering their capacities and limitations. The Social Charter of Services and Equipment Network - Report 2021 highlights services addressing Basic and Instrumental Activities of Daily Living and promoting participation (Ministry of Labour, Solidarity and Social Security, 2023).

Care homes provide collective housing with services like nursing, physiotherapy, and social education, complementing family support (Gökler et al., 2022). Housing is often inadequate for the elderly (Blackler, 2023), which drives demand for these facilities. Day Centers and Home Support Services maintain people at home, preventing isolation and

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encouraging autonomy, either by transporting them to service locations or providing care at home (World Health Organization, 2021).

These institutions offer food, hygiene, cleaning, socio-cultural activities, nursing, medicine administration, and psychosocial support. Workers providing these services face risks affecting quality of life and well-being (Baron & Habes, 2004). Legislation now focuses on workers' health and psychosocial wellbeing (Law No. 102/2009; Teixeira et al., 2019). Psychosocial risks, especially for healthcare professionals, include exposures related to emotional stress, time pressure and burnout (Martínez-López et al., 2021).

Quality of life at work promotes motivation and better service (Freitas, 2022). Workers deal with communicable diseases, dementia, and grief (Latham et al., 2024). Freire (2013) argues this theme restores humanistic values eroded by industrialization. Poor quality of life can cause accidents, reduce motivation, and harm productivity (Leite, 2022), requiring preventive measures (João, 2023).

Despite many studies (Andrei et al., 2024; Polacsek & Woolford, 2022), literature on occupational risk analysis in these organizations remains scarce, justifying this research. Risk perception and exposure are multidimensional and should be studied (Slovic, 2010), particularly in Day Centres and Care Home Support Services, where human interactions are intense.

2.2. Claims in the sector

According to Vieira (2019), accident rates are a practice for managing accidents that have arisen. Knowledge of the national accident rates must be compared with the specific organization's rates. Thus, social action falls under Section Q in the Sector of Human Health and Social Support Activities for the economic activity under study. Table 1, based on data from the Strategy and Planning Office, shows occupational accidents in human health and social activities by sex, which took place in 2021 (GEP, 2023).

Table 1: Occupational accidents in human health and social action activities by sex (2021).

Accidents at work	Total	Men		Women	
	N	N	(%)	N	(%)
Total	166 028	116 447	70%	49 581	30%
Sector Q	15 245	2 407	16%	12 838	84%
Weight of Sector Q	9%	2%		26%	

Source: Own elaboration based on GEP (2023).

Comparing the data from Sector Q, accidents at work in women (84%) are more expressive than in the case of men (16%), with women in Sector Q accounting for about 26% of the total, while men in this sector are only 2%. However, analysing data from 2010 (GEP, 2012), there were 11,493 occupational accidents in Sector Q out of a total of 215,632 accidents, with about 9,599 in women inside Sector Q, which corresponds to 55% of the total number of accidents with women, but in the same percentage of 84% in the comparison of accidents with women in Sector Q compared to the total. In other words, although the number of occupational accidents has reduced by 23% in general between 2010 and 2021, in sector Q, there was an increase of 3,752 accidents (25%), following this growth in accidents with women. Something is wrong, and this economic activity is more vulnerable and prone to workplace failures and accidents.

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The highest percentage of accidents due to physical activity in 2021 was 33% for movements, 20% for manual transport, and 15% for work with hand tools, when in 2010, they had percentages of 29%, 28%, and 19% for the same typology, which is reflected as inherent. However, 15% of accidents in 2021 were framed with "no information," while in 2010, there were 4%, demonstrating events with causes different from the current one. From the perspective of contact, in 2021, about 27% of accidents were due to "physical embarrassment of the body, psychic embarrassment," 18% "crushing in vertical/horizontal movement on/against an immovable object," 18% "contact with a sharp, sharp and rough material agent," and 22% "no information," representing for the year 2010 the percentages for the exact causes, namely 33%, 27%, 17%, and 6%, respectively.

According to the nature of the injury, "superficial wounds and injuries" represented 52% in 2021 and 49% in 2010, with "dislocations, sprains and strains" representing 38% in 2021 and 27% in 2010, and "fractures" 4% in both years. Analysing the body parts affected, the "upper extremities" and "lower extremities" are the most affected, with 42% and 24% in 2021, while in 2010, they represented 38% and 24%. The "back, including spines and vertebrae," and the "head" had 13% and 7% in 2021 and 19% and 9% in 2010, so the injuries are significant regarding causes and body parts affected. The increase in accidents may reflect deteriorating safety conditions or an expansion in sector services due to Portugal's aging population.

2.3. Occupational risks in organizations

Work organization aspects like precarious contracts, work regimes, control, rotation, remuneration, and hierarchical relations can cause dissatisfaction, accidents and occupational diseases (Silva, 2020; Freire, 2019). Institutions must adapt preventative measures to eliminate and control these occurrences (Figueiredo, 2014), adhering to the General Principles of Prevention (Law 102/2009).

Effective risk management requires training, changing mindsets, behavioural adjustments, and controlling unsafe acts (Silva, 2018). Understanding an organization's specific occupational risk factors (biological, chemical, physical, etc.) is crucial for tailored prevention, especially in the social sector where worker well-being directly impacts service quality (Pires, 2019). Residential Structures for the Elderly People can contemplate different type of risk factors, as demonstrate Table 2.

Table 2: Types of risks, possible causes, and probable consequences.

Risks	Possible causes	Probable consequences
Physical - Noise	Doorbells, telephones, cries of disturbed users, operating machines, and others.	Stress, loss of concentration, tiredness, high blood pressure and sleep disorders, headaches, and others.
Physical - Lighting	Inadequate or scarce lighting. There is a lack of lighting in specific tasks.	Eye strain, headaches, and eye diseases.
Physical - Thermal Environment	Exposure to hot and cold environments. Marked temperature differences between locations.	Heat (Heat strokes, heat exhaustion, convulsions, rashes, dehydration, hypothermia). Cold (reduced dexterity, breathing problems, musculoskeletal problems in the neck, shoulders, and back).
Physical - Radiation	It focuses on electromagnetic radiation (microwave, infrared, ultraviolet, laser, and others).	Disorders of the central nervous system, immune deficiencies, harmful consequences for the visual organs, and harmful effects on the skin.
Physical - Vibrations	The machine supports the use of various machines in the vicinity.	Muscle disorders due to prolonged exposure (hands and arms, lower back pain, and back, shoulder, or neck disorders.

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Risks	Possible causes	Probable consequences
Chemical	Use flammable, explosive, toxic, corrosive, irritating, mutagenic, carcinogenic, and sensitizing products.	Skin irritation, eye injuries, respiratory diseases, and cardiovascular diseases affect vital organs, allergic reactions, burns, and asphyxiation.
Biological	Exposure to viruses, bacteria, parasites, or fungi by various forms of contamination.	Allergies, poisoning, viruses, intestinal infections, flu, herpes, hepatitis, meningitis
Lack of Ergonomic Conditions	Workloads (on efforts, movements, and standing position), organizational, psychosocial, and individual factors.	WMSD, RSI, Musculoskeletal Disorders, tendonitis, bursitis, musculoskeletal injuries, and others.
Psychosocial	Levels of pressure and overwork, overtime, lack of staff, injustices, user aggression, night work, monotony, and repetition of tasks, among others.	Stress, anxiety, moral and sexual harassment, burnout syndrome, depression, various feelings, impotence, and suicide.

Source: Own elaboration.

The lack of ergonomic conditions and psychosocial risks are also significant (Law 102/2009). The ergonomics problems in workplaces, linked to physiological factors, often lead to occupational injuries. Psychosocial risks, stemming from management, organization, and social environment (Araújo & Penaforte, 2016), are complex to correct, making prevention paramount.

2.4. Risk analysis and risk assessment

Risk perception is worker-dependent, influenced by age, gender, experience, and knowledge (Conceição, 2021). Organizations play a critical role in behavioural change (Madaleno, 2020), as low-risk perception increases accident probability. Risk knowledge involves anticipating potential causes (Costa, 2020), as risks don't exist without determinants. Risk analysis, crucial for characterization and worker exposure (Tendick et al., 2014), comprises identification of risks and exposed persons, and risk estimation (Águas, 2018). Techniques include Workplace Risk Analysis and accident history, though this depends on the knowledge and experience of those involved.

Subsequently, risk magnitude must be quantified based on its probability and severity (ISO, 2018). Early risk knowledge and intervention (Gökler et al., 2022) are vital for prevention. Probability depends on exposure frequency and involved individuals (Machado, 2020), while severity relates to potential damage. Risk quantification, termed risk assessment, combines probability and severity, utilizing qualitative, semi-quantitative, or quantitative methods. This continuous process involves hazard/risk identification, assessing those affected, quantifying magnitude, implementing preventive measures, recording results, and reviewing the assessment (Costa, 2020).

3. Research methodology

3.1. General and Specific Objectives

The study's general objective is to understand the risks to which workers in a care home are exposed and to define the most appropriate preventive measures for risk control.

Following the general objective, specific objectives were established:

- Analyse workers' perception of risk and the appropriate form of control through preventive measures.
- Carry out risk analysis and risk assessment of work, quantifying the effectiveness of the protection of the solutions used in prevention.

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- Design a set of solutions to be proposed and recommended to reduce the likelihood of accidents and occupational diseases and increase the control of the risk exposure.

3.2. Characterization of the case study: Building and professional categories

The study involves a care home similar to hundreds of institutions in the national territory. The problems are repeated continuously, the risks are common, the preventive measures used are transversal, and the workers follow the same pattern, so the results of this study are transversally applicable in other institutions of this nature and without significant divergence of criteria. The differences are essential in the minimum number of workers defined for the operating framework, which is a requirement of the legislation, depending on the number of institutionalized users (Ordinance No. 349/2023). Institutions with greater capacity to receive users (clients) have more workers required by ratios published in the regulation. They may have other services, such as psychology, physiotherapy, hydrotherapy, nutrition, transport, religious or spiritual assistance.

Before data collection began, formal authorization was obtained from the institution's board of directors. Next, all participating workers received detailed information about the study's objectives and procedures and signed the respective informed consent form, ensuring voluntary participation and respect for the ethical principles of research.

This paper does not reveal the institution's identification and participants under study for confidentiality purposes. It is governed by ethical values such as responsibility, fidelity, secrecy, and truthfulness. As a mission, the institution under study aims to support the older population through different social, cultural, and sports activities, promoting the well-being of its users and workers. This care home, like others, provides its services 24 hours a day, every day of the year, so the interaction of some of its workers is permanent, as is the case with direct-action assistants, who work in shifts integrated into several teams.

Building characterization

The building is located in the north of Portugal, in an area with public road spaces (main entrance, car entrance, and garage), with a surrounding area for activities and leisure for users. The building has 3 floors, with access to the outside guaranteed by the 3 different floors, which facilitates, in case of need, access between floors is made using an internal staircase and elevator. This care home is equipped with 30 rooms, namely 6 triple rooms, 14 double rooms, and 10 single rooms, with the possibility of the latter of 4 rooms being double.

Characterization of Professional Categories

The professional categories are defined in law by Decree-law No. 349/2023, and their minimum number depends on the number of institutionalized users. The workers of the different professional categories are responsible for the operationalization of the services provided, which, in the case of this care home, covers the following professional categories and their quantity, namely: 5 cooks and kitchen assistants, 2 sociocultural animators, 2 nurses, 3 general service assistants, 11 direct action assistants, and 4 administrative staff. The different professional categories allowed the development of the study, considering the specificity of the risk and exposure of the worker in each category.

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3.3. Research Methodology

The study involves a mixed typology approach of a descriptive nature, with the environment being the primary source of information to analyse the problem under study (Silva & Menezes, 2005). The present case study focuses on the study and intensive analysis of the object of study, whose main objective is to obtain specific and organized information on a theme or subject (Patton, 2015). Figure 1 schematically represents the methodology followed in the paper and the different phases of the study.

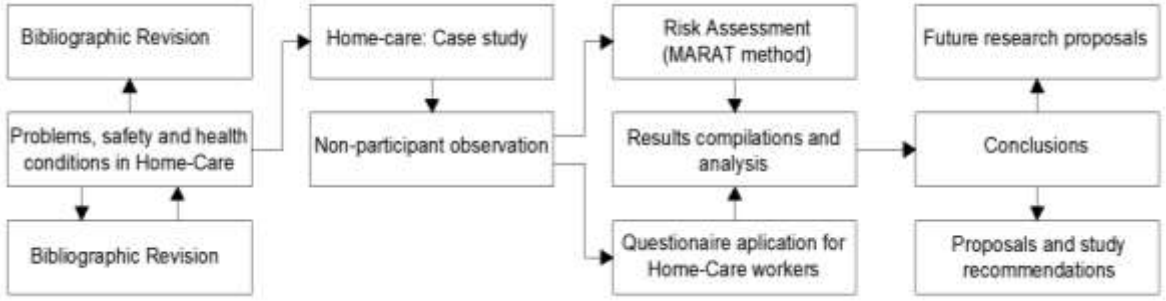

Figure 1: Schematic drawing of the phases followed in the research methodology.
Source: Own elaboration.

The present study addresses the safety and health conditions of workers in care homes (ERPIs). After defining objectives and securing legal authorizations, non-participant observation was conducted to analyse and record worker behaviour across different roles. This allowed assessment of PPE use, teamwork, safety compliance, and potential risk aggravation. Worker opinions were deemed essential to identify unevidenced risks and suggest improved prevention measures. Consequently, a tailored questionnaire was developed for various professional categories, considering specific job-related risks (e.g., burns for cooks, and lacking ergonomic conditions for administrative staff). Some data information from observation was compiled, risks analysed, and workplace-based risk assessments applied (Santos, 2021).

Risk assessment utilized the semi-quantitative Method for Risk and Accident at Work Assessment (MARAT) (Santos et al., 2018). This validated method quantifies risk magnitude and prioritizes interventions for prevention or elimination, aiming for safer work environments. MARAT involves defining a workplace, gathering relevant data, and calculating the Probability Level (NP) from Exposure Level (NE) and Deficiency Level (ND). This NP, combined with Severity Level (NS), determines the Risk Level (NR), which is then framed within a Control Level (NC) (Santos, 2020).

Finally, results from questionnaires and risk assessments inform conclusions, proposals, recommendations, and suggest future research.

4. Results and recommendations

4.1. Application of the questionnaires

The sample application of the questionnaires involves 24 participants in a universe of 36 workers in the care home object of study. For space-related reasons, the description is made considering the results obtained from the various questions in the questionnaires. Some different groups organize the questionnaires according to the following paragraphs.

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a) Demographic characteristics of respondents

Among the respondents, about 22 people working at the study care home are female (92%), and 2 people are male (8%). Of the sample, 50% (12 people) are between 41 and 50 years old, and 25% (6 people) are over 51 years old, so there is an unattractive sector of activity for young people. On the other hand, exposure to various risks by professionals at an older age. About 63% of respondents are married, and 17% are single. In terms of schooling, low levels of schooling predominate, with 50% of the respondents (12 workers) in the 3rd Cycle of Basic Education, 13% (3 workers) in the 2nd Cycle of Basic Education, 17% (4 workers) with Secondary Education, 17% (4 workers) with a Bachelor's degree, and 4% (1 worker) with a master's degree.

b) Professional Characterization

Table 3 summarizes the answers to a set of cross-cutting questions carried out for all professional categories.

Table 3: Answers to several questions by respondents from different professional categories.

Situation/question	Response Possibilities	No. Workers	%
Performance of the profession	Workers in the profession for over 12 years	9	38
	Workers in the profession between 5 and 12 years	11	46
	Workers in the profession for less than 4 years	4	16
Host	Workers were welcomed at the institution	12	50
	Workers were not welcome at the institution	7	29
	Workers did well, but not by co-workers	5	21
In the course of professional activity (0-100% each possibility)	Workers are exposed to physical exertion and standing time	21	87
	Workers go up and down the stairs very often	12	50
	Workers adopt painful postures	19	79
	Workers respond to excessive demands	13	54
Wear and tear of the profession	Workers consider the profession to be very exhausting	23	96
	Workers do not consider the profession to be very exhausting	1	4
Recognition by superiors	The hierarchical superior does not recognize the work.	9	38
	The hierarchical superior recognizes work	7	30
	Workers did not answer	8	32
Negative points or difficulties	The relationship between colleagues	13	54
	Condition of facilities and equipment	5	21
	Lack of workers and working hours	2	8
	Workers did not answer	4	17
Aggression and discrimination	Verbal, physical, sexual or moral aggression	14	58
	Discrimination on the grounds of nationality, race, or age	2	8
	Workers did not answer	8	34
Other questions (0-100% each possibility)	Job changes due to professional demotivation	13	55
	Poor relationship with other colleagues	9	36
	Low salary	8	33
	Psychological fatigue	5	22
	Lack of professional fulfilment	6	25

Source: Own elaboration.

Table 4 aggregates a set of questions from the group under analysis, but applied to workers from different professional categories.

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Table 4: Set of questions applied in the questionnaires of specific professional categories.

Situation/question	Professional Category	Workers	Response Possibilities	n	%
Movement of users	General service assistants, direct action assistants, and nurses	15	With help from colleagues	7	47
			No help from colleagues	8	53
Feeling of discrimination	Cooks, kitchen assistants, general service assistants, and direct-action assistants	18	The workers do not feel discriminated against	14	78
			The workers feel discriminated against	4	22
Occupational disorders (0-100% each possibility)	Nurses	2	Lack of rest	2	100
			Hyper request	2	100
			Frequent interruptions	1	50
			Unpredictable work	1	50

Source: Own elaboration.

c) Professional Risks

Table 5 indicates the results obtained in this group based on the workers' opinion, the perception of risk, and their exposure to it in the performance of tasks.

Table 5: Answers to several questions by respondents from different professional categories.

Situation/question	Response Possibilities	No. Workers	%
Risk perception	Workers with perceived exposure to risk	20	87
	Workers with no perception of risk exposure	4	13
Distribution of occupational risks to which respondents consider themselves to be exposed (0-100% each possibility)	Physical Cliffs	18	75
	Chemical Hazards	6	25
	Biohazards	12	50
	Psychosocial Risks	11	46
	Organizational Risks	10	42
Assertion of exposure to the following risks (0-100% each possibility)	Chemicals	4	17
	Physical Cliffs	7	29
	Temperature Variations	9	38
	Biological agents	11	46
	Inadequate lighting	13	54
Information about the risks to which they are exposed	Workers were not informed	21	88
	Workers were informed	3	12
Control of risks to which they are exposed (0-100% each possibility)	Risks are not controlled	15	63
	The protection measures implemented are not adequate and make no difference	14	58

Source: Own elaboration.

Table 6 aggregates a set of questions that are extra from the group under analysis but applied to workers in the professional categories of administrative (2 workers) and cooks and kitchen assistants (5 workers).

Table 6: The answers to extra questions were applied in the questionnaires for administrative professionals, cooks, and kitchen assistants.

Situation/question	Professional Category	Workers	Response Possibilities	No.	%
Ergonomics and emotional wear and tear (0-100% each possibility)	Administrative	2	Workplace is ergonomic	2	100
			Contact with users, their families, and colleagues causes stress, emotional overload,	1	50
Characteristics and working conditions in the kitchen (0-100% each possibility)	Cooks and Kitchen Assistants	5	Inadequate temperature	5	100
			Inadequate and slippery pavement	3	60
			Inadequate ventilation system	3	60
			Painful and incorrect postures	4	80

Source: Own elaboration.

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d) Organizational and Relational Constraints

Table 7 involves questions about organizational and relational constraints.

Table 7: Answers to questions related to organizational and relational constraints.

Situation/question	Response Possibilities	No.	%
Carrying out tasks	Workers cannot do them and work at a higher pace	13	54
	The carry out of tasks depends on the work team	4	17
Risk perception (0-100% each possibility)	With higher work rates, the greater the risk	21	88
	More workers in the team need to respond	20	83
Work-life balance (0-50% - 12 workers working beyond working hours	Work on a day off	5	23
	Leaving after the hour	3	14
	Condition and instability of users	2	9
	Log in early	1	5
	Work to replace colleagues	1	5

Source: Own elaboration.

In the professional category, cooks, kitchen assistants, and direct-action assistants work shifts (15 workers). About 20% of the group of cooks and 29% of the direct-action assistants say that the morning shifts require much more effort. On the other hand, 71% of the respondents (5 workers) in this category say that the most demanding shift in terms of effort is the night shift. However, 11 of these workers consider that there are no negative aspects of shift work, 2 workers (13%) point out that staying 4 months in the same shift is negative, which they consider inhumane, and when at night, it affects sleep quality in addition to affecting personal life. Another 13% say there is a lack of teamwork.

Often, 79% (19 workers) reported feeling some pain or discomfort at the end of the work shift, with the following causes: tiredness 61% (11 workers), back pain 44% (8 workers), leg pain 44% (8 workers), and varicose veins 11% (2 workers). Analysing the break periods, there is divergence in the answers, as 50% (12 workers) reported that there is a lack of break periods, with the answer being given mainly by the professional category of direct-action assistants (70%, corresponding to 7 workers) and nurses (100%, corresponding to 2 workers).

To understand the work environment and relationships among the respondents, about 75% (18 workers) consider that there is a lack of collaboration, teamwork, and difficulty in communication between colleagues, a sign of psychosocial risks.

Regarding relationships between colleagues, 29% (7 workers) say it is terrible, and 33% (8 workers) say it is reasonable, with more than half of the workers involved. Their relationship with users is characterized by being 58% perfect, with a minimum of 8% for the reasonable option, with a better environment with the user than with co-workers. Specifically, 62% of direct-action helpers (8 workers) say that accompanying users to hospitals/emergency services causes them inconveniences related to: leaving after hours 38% (5 workers), spending many hours in the hospital 31% (4 workers), spending a long time without eating 31% (4 workers), and reconciling the task with personal life 15% (2 workers). It is also important to mention that 61% of these professionals (11 workers) say that it is painful and costly to deal with the mourning due to the death of users, and the rest say they consider it a natural process.

e) Health, Hygiene, and Safety at Work

In this questionnaire group, 79% of respondents (19 workers) say that the activity affects their health, and 58% of all respondents (14 workers) say that hierarchical

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superiors do not care about workers' safety, health, and well-being. About 42% (10 workers) reported an accident, illness, or occupational injury. Of the total of these 10 workers, the highest incidence was tendinitis at 50% (5 workers), varicose veins at 40% (4 workers), and with several responses of 10% (1 worker), namely: road accident, accident when lifting an elderly person/spinal blockage, spinal and bone injury, covid-19, low back pain, viruses.

Analysing sick leave, about 46% of respondents (11 workers) said they had been on sick leave for reasons related to COVID-19, maternity leave, high-risk pregnancy, broken finger, operations, and crises due to the physical effort of work, anemia, tendonitis, psychological fatigue, and family support. Table 8 involves the use of specific PPE in the various professional categories.

Table 8: PPE used by workers in different professional categories.

Workers	Workers	Apron	Key money	Mask	Safety Footwear	Uniform, Gown, Protective Clothing	Goggles, visor
Cooks and kitchen assistants	5	80%	20%		60%		
General service assistants	3		67%	33%	33%	67%	33%
Direct-action assistants	10	20%	100%	40%	10%	90%	
Nurses	2	100%	100%	100%	100%	100%	
Socio-cultural animators	2					100%	

Source: Own elaboration.

The analysis of Table 8 allows us to conclude that the professional category of nurses uses all PPE, representing 100%. However, in the other professional categories, this does not happen and even denotes the lack of use of specific PPE in the performance and tasks of some of these categories. The administrative staff (2 workers) use only office supplies, wrist rests, chairs, and ergonomic keyboards.

Regarding the disposal of gloves, it involved a response by workers in direct-action assistants and nurses, where 75% (9 workers) said they do it at the end of each procedure/user. However, some respondents said they only do it after 3 to 4 procedures/user. Observing this procedure allows us to affirm that the people who answered did not answer the question truthfully.

The surveys asked about geriatric equipment, excluding the professional categories of cooks, kitchen assistants, and sociocultural animators, involving 17 workers. All workers say this equipment facilitates and relieves workload, and 71% (12 workers) use it daily. However, regarding the equipment that the institution does not have and that is needed, the following are listed: cranes 33% (3 workers), quality wheelchairs 33% (3 workers), equipment to help move users to vehicles 22% (2 workers), quality shower chairs 11% (1 worker), and equipment to move bedridden users 11% (1 worker). However, about 63% of the respondents (15 workers) declared that the existing equipment was sufficient to carry out the tasks.

f) Training

In the training group questionnaire, about 88% of the respondents did not receive any training in the phase of starting work in the institution, and 74% did not have training in aging or geriatrics. This question is intended for all professional categories except Cooks and Kitchen Assistants. 75% (8 workers) said no regarding training adjusted to their tasks.

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Table 9 contemplates the different professional categories, the areas of training received, and the areas they consider lacking.

Table 9: Training received and training missing by the different professional categories.

Professional Category	Areas of training received	Missing areas of training
Administrative (2 workers)	1 worker: geriatrics, dementia, stress and emotional load, management. All workers are first-aid workers.	No training is required 50%, and humanization is required 50%.
Kitchen and kitchen assistants (5 workers)	Fire Prevention and Fighting 100%, First-Aid 100%, Food Preservation and Quality 40% (2 workers), and Accident Prevention in the Kitchen Context 20% (1 worker).	No training required 40% (2 workers). Training in the kitchen area 60% (3 workers).
General service assistants (3 workers)	First aid 100%, positioning and lifting of the elderly 50% (2 workers).	No training required 67% (2 workers).
Direct action helpers (6 workers)	First aid 100%, positioning and lifting of the elderly 100%, dementia 50% (3 workers), manual handling of loads, geriatrics, and stress and emotional load 33% (2 workers), Humanization 17% (1 worker).	No training is required 70%, chronic diseases 10%, geriatrics 10%, and a practical perspective 10%.
Nurses (2 workers)	First aid is 100%, and manual handling of loads is 50% (1 worker).	Geriatrics, dementias, stress, and emotional load 50% (1 worker).
Socio-cultural animators (2 workers)	First aid 100%.	Specific training in the socio-cultural area, sports, and socio-cultural animation 100% (2 workers).

Source: Own elaboration.

g) General considerations about questionnaires

The analysis of results in the survey component involves the first specific objective. It focuses on the perception of risk by workers in a care home. This situation is generally seen as present, with workers aware of the risk and the necessary preventive measures. However, sometimes they do not use them. There is a notion regarding the lack of training that they consider essential for better performance of functions, which will help correct work practices (ergonomics) and use PPE and CPE. However, there is a lack of specific fields in the latter field. Some workers assume the wear and tear is caused by professional performance during the activity. Furthermore, they cannot foresee possible consequences, such as poor ergonomic conditions and psychosocial risks, and, specifically, they perceive that the environment between colleagues is not desirable, admitting that it is better with users.

4.2. Risk assessment

Risk assessment involves the application of the MARAT method through the observation of risk exposure by workers in the different professional categories of the study care home. The magnitude of the risk is accounted for by adjusting the different variables to the meaning expressed in each table. Thus, the MARAT method involves the following formulas based on the application of the values obtained in the support tables that are part of the method:

$$\text{Risk Factor (RF)} = \text{Probability Factor (PF)} \times \text{Severity Factor (SF)} \quad (1)$$

$$\text{Probability Factor (PF)} = \text{Exposure Factor (EF)} \times \text{Deficiency Factor (DF)} \quad (2)$$

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However, the Risk Factor (RF) is framed in intervals, which depend on the value used to determine the Control Score (CS), according to Table 10.

Table 10: Determination of the Control Score (CS).

CS	Interval	Risk situation meaning
I	3600-10850	Critical. Urgent intervention. Isolate the hazard until permanent control measures are adopted.
II	1240-3100	Rectifying the situation and taking control measures until the situation is reduced or eliminated.
III	310-1200	Situation to improve. Develop intervention plans.
IV	90-300	Improve if possible. It is appropriate to justify the intervention.
V	10-80	Do not intervene unless justified by a more precise analysis.

Source: Elaboration based in Ferreira (2017).

Table 11 includes the most expressive and magnitude-major risks (NR) for the professional categories: Cooks and kitchen assistants, Sociocultural animators, Direct action assistants, and General service assistants. Table 12 includes the risk assessment in the professional categories: Administrative and Nursing.

Table 11: Risk Assessment (MARAT method) with the most significant risks of the professional categories Cooks and kitchen assistants, and Sociocultural animators.

Professional category	Hazards	Risks	RF	CS
Cooks and kitchen assistants	Cleaning the slippery floor/floor	Drop in level	4500	I
	Interpersonal conflicts	Psychosocial	3000	II
	Standing work (long period), inadequate postures	Musculoskeletal disorders	3000	II
	Contact with hot surfaces	Burns	1800	II
	Manual handling of heavy loads	Musculoskeletal disorders	1800	II
	Disorganized bench	Cuts	1440	II
Socio-cultural animators	Moisture seepage in the activity room	Respiratory diseases	3780	I
	Moisture seepage in the activity room	Electrocution	2520	II
	Moisture seepage in the activity room	Drop in level	2420	II
	Adoption of inappropriate postures	Musculoskeletal disorders	3000	II
	Direct contact with users	Biological	1800	II
	Manual handling of heavy loads	Musculoskeletal disorders	1800	II

Source: Own elaboration.

Table 12: Risk Assessment (MARAT method) with the most expressive risks of the professional, Direct-action assistants, General service assistants, administrative, and nurse categories.

Professional category	Hazards	Risks	RF	CS
Direct action assistant	Movement of users - Forceful exertion	Musculoskeletal disorders	3000	II
	Movement of users - Repetitive strain injuries	Musculoskeletal disorders	3000	II
	Distress and accelerated work rhythms	Burnout - Psychosocial	3000	II
	Sleep disturbance	Psychosocial	3000	II
	Car driving	Collision, rollover	1620	II
	Extension of shifts	Psychosocial	1440	II
	Wet floors	Drop in level	1440	II
	Use of cleaning chemicals	Chemical burn and inhalation	1440	II

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Professional category	Hazards	Risks	RF	CS
General Service Assistants	Standing work (long period), poor postures	Musculoskeletal disorders	3000	II
	Efforts and awkward postures	Musculoskeletal disorders	1800	II
	Transport and movement of users - Forceful exertions	Musculoskeletal disorders	1800	II
	Car driving	Collision, rollover	1620	II
	Use of stairs in maintenance tasks	Fall from a height	1620	II
	Maintenance work	Cuts and perforations	1440	II
	Ironing users' clothes	Burns	1440	II
Administrative	Adoption of incorrect or prolonged postures in the seat position	Musculoskeletal disorders	3000	II
	Distress and accelerated work rhythms	Burnout - Psychosocial	750	III
	Direct contact with colleagues, users, and family members of users	Biological	750	III
	Prolonged exposure to the computer, poor light	Eye injuries	750	III
	Photocopy and scan documents	Radiation	480	III
	Users/clients with involuntary movements or psychopathologies and direct contact with family's users	Physical and psychological aggression	450	IV
Nurses	Distress and accelerated work rhythms	Burnout - Psychosocial	4200	I
	Incorrect or prolonged postures in the sitting position	Musculoskeletal disorders	3000	I
	Direct contact with users	Biological	1800	II
	Prolonged exposure to the computer, poor light	Eye injuries	600	III
	Users with involuntary movements or psychopathologies and direct contact with family's users	Physical and psychological aggression	150	IV
	Use of nursing utensils	Cuts, perforations	150	IV

Source: Own elaboration.

The risk assessment for the different occupational categories involves the application of the second specific objective, highlighting a repetition of risks between different occupational categories. However, the causes/tasks and possible hazards are manifestly different, with a special focus on the risks: lack of ergonomic conditions, psychosocial, and various injuries (repetitive strain injuries, musculoskeletal disorders). These mostly have results at the most expressive magnitude level, which are not to be neglected. Risks such as drops in level are frequent, but like other physical risks, they can be avoided more easily by correctly adjusting prevention measures. Some risks are related to complementary and non-direct tasks, such as those associated with road accidents, a situation framed in travel on behalf of the institution, and even guaranteed services outside the institution, such as home support.

4.3. Results Discussion

The results obtained in this study confirm the high exposure of workers in an ERPI to occupational risks of various kinds, corroborating the evidence presented in previous studies (Araújo & Penaforte, 2016; Pires, 2019; Silva, 2020). The prevalence of inadequate ergonomic conditions and psychosocial risks, identified in different professional categories, is particularly worrying, as these risks have a direct impact on the physical and mental health of workers, favouring the emergence of musculoskeletal injuries, fatigue, burnout, and absenteeism (Teixeira et al., 2019; Andrei et al., 2024). The analysis carried

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out using the MARAT method made it possible to quantify the magnitude of the risks, demonstrating that many are at levels that require urgent or corrective intervention (levels I and II), which reinforces the need for robust and immediate preventive measures.

From an organisational point of view, the lack of initial and ongoing training, reported by most workers, stands out, a situation that increases the likelihood of unsafe behaviour and non-compliance with biosafety standards, in line with the findings of João (2023) and Gökler et al. (2022). The absence of clear information about the risks to which they are exposed (88% of respondents) and the perception that protective measures are insufficient or ineffective (58%) indicate failures in internal communication and institutional safety culture. In addition, the results relating to physical and emotional exhaustion, namely pain at the end of the shift, perception of lack of breaks and difficulties in relationships between colleagues, point to the need for interventions that promote healthier work environments, including stress management strategies, conflict mediation and wellness promotion programmes, as recommended by the Directorate-General for Health (2021) and international literature (Polacsek & Woolford, 2022).

4.4. Preventive measures and recommendations

Prevention measures, based on a hierarchy including training, administrative control, and individual/collective protection, are crucial for effective risk management. Employers are legally obligated (Law 102/2009) to guarantee worker safety and health, especially the General Principles of Prevention. Transversal measures include health guidelines, using protective barriers, disinfecting equipment, and worker training.

Based on the results obtained with the application of the questionnaires and the risk assessment applied based on direct observation, table 13 is described, which includes the compilation of results from these sources of information for each professional category. The proposed solutions aim to reduce accidents and occupational diseases by increasing control over risk exposure. While these solutions involve costs, investing in safety and health is an investment in future benefits.

In some professional categories, although less expressive, some risks, such as psychosocial risks, do not cease to need control and prevention. Thus, transversal measures are defined for all workers, highlighting the following in a non-unequivocal way: development of sports activities (futsal, fitness, yoga, padel, water aerobics/swimming, among others); practices such as team building sessions, brainstorming, social dinners, implementation of award practices and incentives for workers (days off on birthday, election of the worker of the month, among others); Creation of a conflict moderator. In the prevention of psychosocial risks, in addition to the specific measures described, the seasonal presence of a professional who works as an occupational psychologist is pertinent, which is not a legal obligation but is perceived as fundamental and increasingly necessary. More significant interaction with occupational medicine physicians can also help in prevention, with a more regular frequency than the law requires.

In Sector Q, beyond general preventive measures, crucial training includes ergonomic techniques for proper user transfers and postures (Olson et al., 2014) and correct manual load handling (Decree-Law No. 330/93). Proper use of Personal Protective Equipment (PPE), such as gloves and masks (Hoedl et al., 2024). However, specifically for the categories of direct-action assistants and general service assistants, there is a need to use complementary means of geriatrics for collective Protective Equipment (CPE), such as

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transfer cranes, transfer chairs, transfer lifts for positioning in vehicles, articulated beds, recliners, and others, which is also fundamental.

Table 13: Preventive measures and recommendations for the different professional categories.

Preventive Measures and Recommendations	A	B	C	D	E	F
Level drop: Use wet road signs; use non-slip safety footwear; Replace kitchen flooring with non-slip coating.	x					
Psychosocial Risks: individual or group therapy on conflict mediation; strengthen the institution's structure; work breaks.	x		x		x	x
Ergonomic conditions: Avoid static posture while standing, alternating movements (when possible, sitting); implement work breaks; use ergonomic insoles and footwear.	x					x
Cuts: knives with non-slip handles; knives in a safe and organized place; organized benches; PPE suitable for kitchen work; Use of non-slippery boards.	x					
Burns: handles of the pots in the direction of the stove; PPE and other utensils for high temperatures; organized workbench; move away from hot utensils.	x					
Respiratory diseases: Training on firefighting means implementing inspection and maintenance routines in the building, using PPE, and unsuitable signal sockets.		x				
Drop-in level: Use wet floor signage and clean water infiltrations.		x	x			
Biological: Up-to-date vaccination plan; masks and gloves for users with communicable diseases; communication between the different professional categories on the health status of users; disinfect and sanitize hands, clothes, and other materials.		x	x		x	x
Ergonomic conditions: Stable desks and chairs without sharp angles; avoid maintaining the same position for long periods, alternating to a sitting position; training.		x			x	x
Ergonomic conditions: movement of users made by 2 workers and correction of postures; relaxation and muscle relaxation exercises; training			x	x		x
Collision and hit-and-run: Adopt defensive driving and training			x	x		
Organizational: adapt the work to the work schedule; Harmony of personal and professional life.			x			
Chemicals: Use PPE (mask, gloves, safety footwear)			x			
Fall from height: immobilization of mobile ladders (legislation); teamwork; PPE.				x		
Eye injuries: monitor at eye level and in front; alternate with other activities.					x	
Radiation: Always close the printer cover before starting to scan.						

Legend: A - Cooks and kitchen assistants; B - Socio-cultural animators; C – Direct action assistants; D - General service assistants; E – Administrative; F – Nurses.

Source: Own elaboration.

5. Main conclusions

The study involves a case study of the risks of different professionals in a care home, which, despite involving a specific location, the risks evidenced here are very similar to the risks present in institutions with the same social purpose. Occupational accidents have increased in this professional area and have become evident in the sector's statistics. Hence, clarifying the present risks and adjusting preventive measures for risk control is crucial for workers' health and quality of life.

The methodology involved the application of questionnaires addressed to professionals distributed by different professional categories, whose results generally show workers' perceptions of risk. Psychosocial, biological, ergonomic conditions, chemical, and physical risks, among others, are present and are evidenced. On the other hand, the non-participant observation of the tasks performed by workers of the different professional categories allowed a detailed and realistic risk assessment to be carried out, whose results at the level of quantification of the magnitude of risk, also highlight the psychosocial, ergonomic, physical, and organizational risks, which should not be discarded. Although those involved may not have been sincere in some of the answers in the questionnaire

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phase, the non-participant observation allowed us to demystify these acts and consequently consider realistic situations in the different workplaces.

Subsequently, compiling the information from the two sources allows a reflection on the preventive measures necessary to control the risk, thus avoiding accidents at work and the appearance of occupational diseases, which is fundamental in this sector. However, the preventive measures considered priorities relate to techniques for preventing psychosocial risks, including an occupational psychologist's presence, even if it is seasonal. There are other risks with specific control needs, such as using equipment that helps move users with more significant mobility difficulties, such as cranes and elevators. This type of equipment is known to the professionals involved, but it almost always does not exist in the institutions where they work.

In conclusion, the study clarifies the risks in this type of institution, as well as the preventive measures and more appropriate strategies proposed for risk control and prevention of the occurrence of risks, especially some more complex treatments, such as psychosocial and inadequate ergonomics conditions. More specific studies at this type of risk level in future research work are shown to be of increased priority. The scope, frequency, and lack of control measures, very typical of these risks, require investment, articulation, and acceptance of the organization to obtain satisfactory results in the medium and long term in the human resources of the institutions.

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