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Architectural accessibility and perception of falls of elderly people in the peridomicile: mixed method

Acessibilidade arquitetônica e percepção de quedas de idosos no peridomicílio: método misto

Accesibilidad arquitectónica y percepción de caídas del anciano en el peridomicilio: método mixto

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ABSTRACT

Objective: To describe contents, structure and origin of social representations about falls by elderly people, the peridomiciliary structural conditions that predispose to falls, and to relate the implications of these empirical evidence on the routine of the elderly in the architectural context.

Method: Convergent mixed method by triangulation. Qualitative approaches(structural, n=195 and procedural, n=40of the Theory of Social Representations) and quantitative (descriptive sectional, n=183) were used. Elderly people enrolled in primary care were interviewed at home in 2018. Analysis techniques: categorical-thematic, prototypical, statistical, and deductive according to Leininger.

Results: Categories of analysis: 1) Peridomicile: fall scenario and 2) Aging and vulnerability: risk of falls in peridomicile. The following environmental characteristics were precursors to falls: uneven floors, holes, unevenness and objects in the pathway. Feelings and behaviors allocated in the possible central core are associated, justifying falls, and determining their causes.

Conclusion: There was an association between the peridomiciliary architectural environment and the predictive characteristics of the risk of falls.

Keywords: Aged. Architectural accessibility. Nursing theory. Accidental falls. Nursing.

RESUMO

Objetivo: Descrever conteúdos, estrutura e origem das representações sociais sobre queda apresentadas por pessoas idosas e condições estruturais peridomiciliares que predispõem à queda e relacionar as implicações dessas evidências empíricas na rotina de idosos no contexto arquitetônico.

Método: Misto convergente por triangulação. Utilizaram-se as abordagens qualitativa (estrutural, n=195 e processual, n=40 da Teoria das Representações Sociais) e quantitativa (seccional descritiva, n=183). Foram entrevistados idosos no domicílio adscritos à atenção primária, em 2018. Técnicas de análise: categorial-temática, prototípica, estatística e dedutiva segundo Leininger.

Resultados: Categorias de análise: 1) Peridomicílio: cenário de queda e 2) Envelhecimento e vulnerabilidade: risco de queda no peridomicílio. Apresentaram-se como características ambientais precursoras de quedas: pisos irregulares, buracos, desníveis e objetos no percurso. Sentimento e comportamentos alocados no possível núcleo central se associam, justificando as quedas e objetivando suas causas.

Conclusão: Evidenciou-se a associação entre o ambiente arquitetônico peridomiciliar e as características preditoras do risco de quedas.

Palavras-chave: Idoso. Acessibilidade arquitetônica.Teoria de enfermagem. Acidentes por quedas. Enfermagem.

RESUMEN

Objetivo: Describir contenido, estructura y origen de las representaciones sociales sobre las caídas de los ancianos, las condiciones estructurales peridomiciliares que predisponen a las caídas; y relacionar las implicaciones de estas evidencias empíricas sobre el cotidiano de los ancianos en el contexto arquitectónico.

Método: Mixto convergente por triangulación. Enfoque cualitativo: estructural (n=195) y procedimental (n=40) de la Teoría de las Representaciones Sociales y cuantitativo: descriptivo seccional (n=183). Se entrevistó en domicilio a ancianos inscritos en atención primaria (2018). Técnicas de análisis: categórico-temático, prototípico, estadístico y deductivo según Leininger.

Resultados: Categorías de análisis: 1) Peridomicilio: escenario de caída y 2) Envejecimiento y vulnerabilidad: riesgo de caídas en peridomicilio. Las siguientes características ambientales fueron precursoras de caídas: pisos irregulares, agujeros, desniveles y objetos en el camino. Se asocian sentimientos y comportamientos alojados en el posible núcleo central, justificando las caídas y apuntando a sus causas.

Conclusión: Hubo asociación entre el ambiente arquitectónico peridoméstico y las características predictivas del riesgo de caídas.

Palabras clave: Anciano. Accesibilidad arquitectónica. Teoría de enfermería. Accidentes por caídas. Enfermería.

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INTRODUCTION

Urbanized countries with aging populations segments require public programs and policies that guide the planning of public spaces to be accessible to everyone, considering the conditions of the environment, housing, built environments, healthcare services and transportation[1–3]. The planning and execution of such programs and policies require problem-solving health care service models and professional actions based on integrated care and an expanded health conception[1–3].

Elderly people with compromised functional capacity are more vulnerable to health problems and environmental conditions. In view of this, unsafe environments are risk factors that expose them to events such as falls, intensifying morbidity and mortality and compromising the lifestyle of this population[4]. The physical environment free of locomotion barriers has been associated with the concept of architectural accessibility.

Despite regulations and norms about the conditions of architectural accessibility in public spaces, this requirement remains a challenge for the freedom of safe movement of elderly people in both urban and rural regions[5]. However, interventions on the environment should be carried out with systemic perspectives that do not make the environment an element dissociated from other factors that may justify risk events to the safety of the elderly people. Episodes of falls among elderly people occur in complex, systemic situations that are integrated with the conditions around their peridomicile, which requires transformations and structural adaptations in the urban and rural spaces around their homes[2,4,6].

The peridomicile represents the space in which the elderly person transits and/or can be found, performing daily or occasional actions with a compatible distance to be walked on foot, encompassing the places of instrumental activities of daily living, health care, access to commerce, leisure and religious practices[7].

Although it is relevant to understand the fall in the peridomicile in the broader perspective of environment, individual and community, this knowledge still has gaps[8–13]. The better understanding of falls in the peridomicile is related to an individual-centered perspective that includes the autonomy and functional capacity of elderly people.

A systematic review conducted in 2020 to verify the impact of person-centered care and patient safety assumed that this concept is of value to nursing practice and theories. In the review, the authors identified 16 studies in ten databases, and one of these addressed falls among elderly people, having been carried out in a hospital setting[14]. The authors recognized that although there is evidence on the benefits of person-centered health care, research is needed that includes interventions capable of promoting health to achieve results related to the safety of the aged person.

In the face of the broad concept of person-centered care, functionalist or disintegrating theories would be insufficient to achieve the descriptive and explanatory power. Therefore, the Theory of Social Representations (TSR) can be a viable alternative for understanding the insertion of elderly people in the peridomicile by observing the collective dimension and capturing the interrelationship between social and historical practices. The mental elaborations socially constructed by the dynamics between the subject's psychic activity and the object of knowledge favor the understanding of the subjects' behaviors, values and knowledge[15].

In the explanatory perspective of nursing theories, Leininger's proposal offers a conceptual structure to support the perception of social elements and cultural accommodation on how to deal with the health/disease process[16]. The characteristics of this nursing theory can help as a reference when delimited to the context of the locomotion places of elderly people and the risk of falls.

In view of the above, the objective was to describe the contents, structure, and origin ofsocial representations about falls presented by elderly people and the peridomiciliary structural conditions that predispose to falls and to relate the implications of this empirical evidence in the routine of the elderly person in the architectural context.

METHOD

Mixed method research convergent by triangulation[13], conducted from January to June 2018, whose qualitative stage comprises the procedural[15] and structural[17] approaches of the Theory of Social Representation, and the quantitative stage presents a descriptive sectional study[18]. The approaches had similar weights and the data analysis process took place in an integrated manner, with complementary convergence of results, using Leininger's theoretical and philosophical framework[16]. The description followed the investigation criteria of the Mixed Methods Appraisal Tool (MMAT), version 2018[19].

The research scenario consisted of the homes of elderly people in an area assigned to a Basic Health Unit (BHU) in a city in the Zona da Mata region of Minas Gerais. The unit was chosensince most of the authors of this study have a relationship with elderly people due to teaching, research and extension activities, a favorable condition for conducting an in-depth interview. It is a Uaps with a mixed model in

which the Family Health Strategy (FHS) and the Community Health Agent Program (CHAP) coexist, covering more than 50 thousand inhabitants, since the neighborhood has a percentage of elderly people higher than the national average. This fact justified focusing on elderly people, including those aged ≥65 years.

The sample was calculated in the G Power 3.1 software using the following criteria: the average effect size estimated for α of 0.05 and β of 0.80, with an estimated approach of 200 participants for the chi-square test[20]. The search for participants was guided by a list of elderly people constructed in a university extension project in the area assigned to Uaps, updated two years ago (234 members). Losses were replaced when they were ≥10% of the sample calculation in any of the research stages from the mentioned list.

The logistics of obtaining the sample to add new members after the list was exhausted was doing active search in households, which allowed expanding the area of approach within the territory of Uaps and overcoming the backlog in the last two years. The criteria for selecting participants for the procedural approach of the TSR were as follows: people who were able to express themselves verbally, had a private environment for the in-depth approach, as well as personal and family stories and accessed different architectural contexts.

The eligibility criteria were being aged ≥65 years; being lucid, with coherent speech, and able to walk. Exclusion criteria were not being found at home during the data collection period after three consecutive visits. There were ten losses due to: refusal, change of address, hospitalization, death, change in cognitive profile. Recruitment was conducted at home by individual invitation, during extension and research activities, using as reference the members of a list used in extension activities. The sample selected for the procedural stage of the TSR comprises a selection of participants who were in the stages of the sectional study and the structural approach, and the number of participants is justified by achieving theoretical saturation.

The process of data collection was operationalized through sequential and simultaneous procedures[13]in three visits to each participant, with time varying from 15 to 30 minutes. It was conducted by two properly trained researchers and, to reduce time and minimize typing bias, the Open Data Kit application was used on an Android® device. An in-depth interview was conducted with audio recording, with an average time of 20 minutes (varying from 15 to 30 minutes), influenced by the participant's profile and included the discursive contents and cursive records in a field diary on the social context and evidence of non-verbal communications.

In the qualitative approach (structural stage of TSR: n=40), it was used the technique of Free Association of Words Unleashed by Images (TALPDI – *Técnica de Associação Livre de Palavras Desencadeadas por Imagens*)[21]. The inducing term "falling outside home" was verbally presented and chosen to portray the possibility of fallsin the peridomicile in a language accessible to the participants' level of understanding.

In the qualitative approach (procedural stage of TSR n=195), the participants' speeches were obtained through in-depth interviews, and the discursive content was audio recorded and fully transcribed. It was triggered by the guiding question: Tell me about a case of falling outside home that happened to you or that was told to you.

In the quantitative approach (sectional study: n=195), the variables investigated were: sociodemographic (age, gender, self-declared skin color, number of children, marital status and occupation); peridomicile profile (obtained from detailing the peridomicile in the field diary); self-perception of risk for falling in the peridomicile, based on the situations observed in the environment or participants' statements (environment with/without: carpet, safety bar, lighting, slippery floor, uneven floor or floor with holes, steps, stairs, handrail, many objects in the environment, in addition to sidewalks with obstacles, low toilet, lack of accessibility in places to shop, surface with slopes and lack of support for locomotion) and Fall Efficacy Scale (FES)[22]. This scale has been cross-culturally adapted and validated for the Brazilian context[22]and was part of the outcome of this investigation as it allows us to say whether or not a person is a faller based on the relationship between fear and activities of daily living.

To support the data collection process of the evocations and the sectional study, the Software Open Data Kit (ODK) was used via Android® application, aiming to reduce typing bias and transposition of information and to optimize the time of data treatment.

The names evoked by TALPDI were transposed to the software Word for Windows, homogenized using the technique of dictionary of equivalent terms (lexicographic and semantic criteria), and a prototypical analysis was performed in the *Ensemble de Programmes Permettant L´analyse des Évocations* (Evoc) software until obtaining the four-house chart[23]. A total of 864 words were evoked, of which 106 were distinct. The criteria used in the prototypical analysis were allocation of names, according to Zipf Law to set the cutoff point to be included in the corpus, which was composed of 68.1% of the evoked contents; minimum frequency of 30; intermediate frequency of 50 and rang of 2 (calculated by the median of the average evocation orders after excluding names not incorporated in the analysis).

The contents of the speeches obtained in the procedural approach of the TSR were treated and consolidated in the NVivo software version 11®. Thematic content analysis was used according to Bardin[24] with units of meaning after floating and in-depth reading of the speeches. The information obtained in the investigation scenarios was recorded in a field diary. The criteria for creating the units of meaning were: the *corpus* contained in the nodes, the deduction of the elements of culturally congruent factors to the dimensions of cross-cultural care according to Leininger (technological; religious and philosophical; political and legal and economic)[16] and the origins and representational dimensions according to TSR[15]. The formation of the categories was confirmed by the theoretical consolidation measured by the Pearson coefficient ≥0.70[25] whose construction was reaffirmed by two other PhD researchers with experience in assistance, research and teaching; elaboration of qualitative research and with the use of theoretical, methodological and thematic framework adopted.

Quantitative variables were consolidated in the Statistical Package for the Social Sciences (SPSS) version 22 and treated using descriptive statistics (mean, standard deviation, percentage values) and correlational statistics (p-value≥ 0.05 and CI= 95%).

The results were related to provide a convergent analysis by triangulation of the results of structural and procedural approaches of TSR with the quantitative data that were analyzed and discussed in the light of the meta paradigm concepts proposed by Leininger, aiming to identify the contents that were concordant and discordant for the different approaches.

The research was approved by the Research Ethics Committee, with Certificate of Presentation of Ethical Appreciation No. 48116115,0,0000,5147 and Opinion No.2,569,508. After presenting the objectives, methodological path, and ethical aspects for the production of the study, the participants signed the Free and Informed Consent Form (FICF). To ensure the anonymity of the participants, they were identified by alphanumeric codes.

The explicit flow of research development recommended by the MMAT is shown in Figure 1.

RESULTS

A total of 195 individuals aged ≥65 years participated: 78.5% were women; with a mean age of 75 years (65 to 96 years; SD= 7.109), with 29.6% aged ≥80 years; 69.4% self-declared white skin; 51.7% with children, 36.8% with more than three children; 68.6% were married and/or lived with a partner in a stable union and 74.2% were retired and had an average income of 1.5 minimum wages.

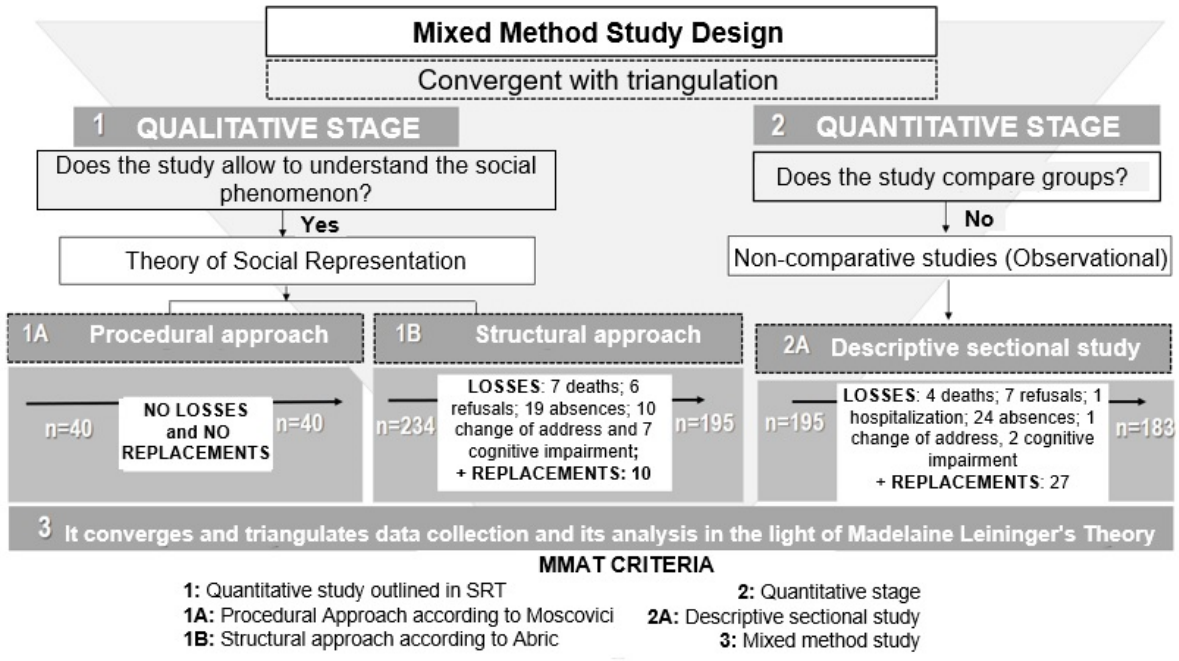


Figure 1 – Study flowchart diagram. Juiz de Fora, Minas Gerais, Brazil, 2022
Note: MMAT-Mixed Methods Appraisal Tool; TSR-Theory of Social Representation
Source: the authors.

The peridomicile of the participants, according to the field diary, presented: hilly terrain; uneven floor; non-standardized sidewalks; few areas with accessibility for wheelchair users and people with limited mobility. The traffic of people, buses and cars was intense during school and university entry and exit time and during business hours, including peak activity times, from 7 am to 9 am, 11 am to 2 pm and 5 pm to 7 pm. It is a lower-middle class neighborhood with weaknesses in urban infrastructure.

To apprehend the social perspective of falls in the peridomiciliary context, Figure 2 presents the four-house chart obtained from the evocation triggered by the inducing term "falling outside home".

Based on the thematic content analysis, two categories were identified, portraying the representational contents and the categories that emerged from theoretical consolidation, which were showed in a dendogram and circle chart, with fragments of the participants' speeches according to categories, dimensions of culturally congruent care according to Leininger, dimensions and representational origins (Chart 1).

Vulnerability was measured by the participants' self-perception of falls in the peridomicile according to the categories "non-faller" and "faller" shown in Table 1.

As this is a mixed method study, with the outcome of being a faller or non-faller in the peridomicile (FES Scale), Figure 3 shows the main results of each approach and the triangulated results for the synthesis outlined for in the mixed method.

The collective representation about falling in the peridomicile is based on the conditions of public ways – environment of intergenerational socialization -, where the elderly person culturally seeks to meet their social, economic, political-cultural and health demands. The name "hole-path-sidewalk-street" reaffirms the objectification of falls, corroborated by "steps/uneven floor/holes and many objects in the environment" (p-value = 0.040) for the fall in the peridomicile.

Induction through data triangulation and theoretical deduction allowed the translation of Leininger's metaparadigm to the context in question, based on the following concepts: 1) Person: individual aged ≥65 years, susceptible or not to the aggravations of the geriatric syndrome, culturally inserted in the peridomicile, sharing behaviors and values when moving in this context, feeling (in)secure; 2) Environment: social and cultural dimension, political and technological of the peridomicile, perceived by social subjects and observed by field records as inappropriate for the safety of elderly people, generator of fear of falling and predictor of falls; 3) Health-disease process: state of social, cultural, physiological, emotional, personal, political and technological security in the face of permanence and displacement for socialization, intergenerational interaction and meeting demands in the urban environment; 4) Nurse: professional with technical, political and educational skills, who modulates knowledge and clinical practices with the culturally congruent values of elderly people, focusing on the sociocultural-architectural environment to allow a perception of a safe and suitable place for fall prevention.

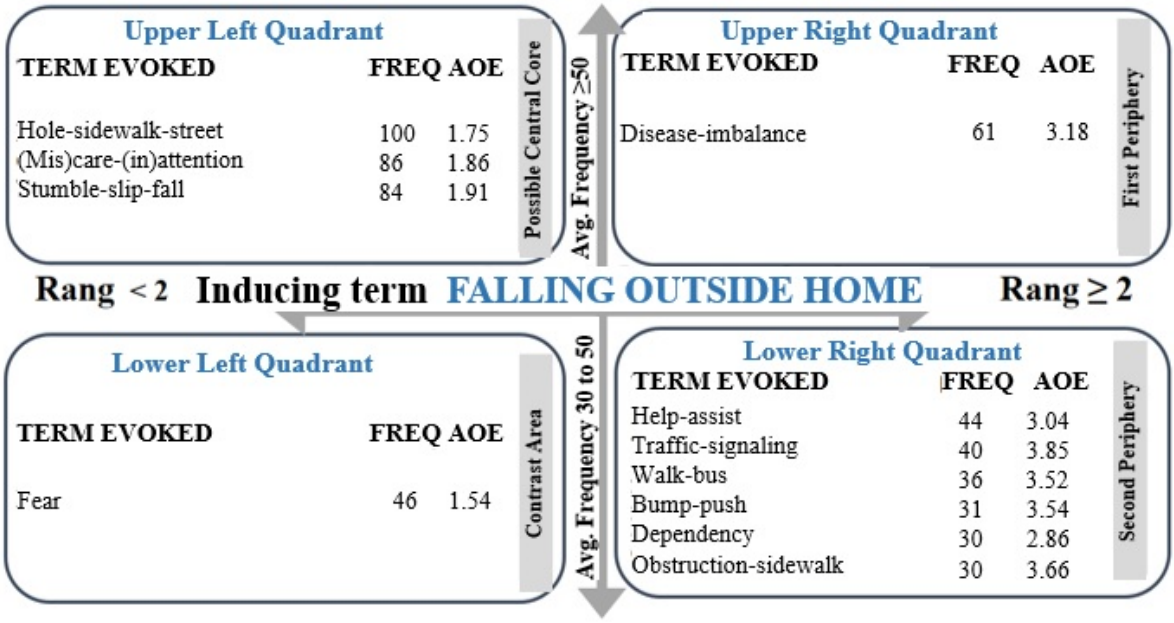


Figure 2 – Four-house chart from the inducing term "falling outside home". Juiz de Fora, Minas Gerais, Brazil, 2022

Note: FREQ – Frequency; AOE – Average order of evocation.

Source: Evoc software.

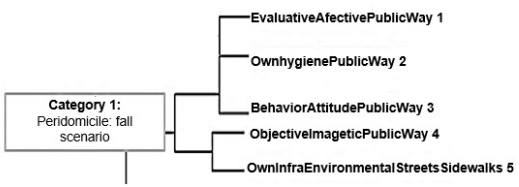
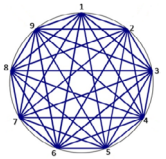
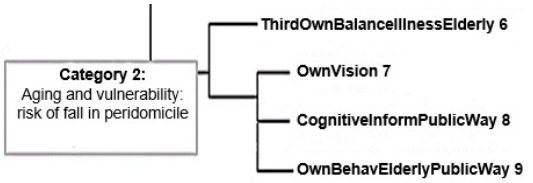
	CATEGORY 1 – Peridomicile: fallscenario		CATEGORY 2 – Aging and vulnerability: risk of fall in peridomicile
Factors/Origin		**Circle Chart** 	
Technological	***Cognitive and informative:*** *The street has no structure, sometimes a hole, anything, can throw me to the ground. E165* ***Behavioral and attitudinal:*** *She had a fracture, he was using a walker and still cannot walk properly. She's doing physical therapy, he put a plaque. She is in a lot of pain and is walking with great difficulty. E189* ***Evaluative or affective:*** *Evaluative or affective: If you break a femur, the pelvis and have to walk on crutches. E196*		***Cognitive and informative:*** *After a while, I had an x-ray because of osteopenia, then the doctor said that there is an injury due to the previous fall. E189* ***Behavioral and attitudinal:*** *You have to be careful with the rush so as not to cause an accident. E178*
Religious	***Cognitive and informative:*** *Because of holes, uneven sidewalks. E140* ***Behavioral and attitudinal:*** *I go to church and I'm afraid of falling. Bricks slip. E167* ***Objective and imagetic:*** *I'm afraid of those slopes on the street E167*		***Cognitive and informative:*** *She did all her activities, ran all the churches in Juiz de Fora. She went to everything! I think she just didn't go (died), because of her faith, otherwise it would be worse. E177*
Family and social	***Behavioral and attitudinal:*** *One day I was going to my daughter's and there was a bump on the sidewalk. E138.*		***Behavioral and attitudinal:*** *I was walking down the street, I lost my balance and fell... E189* ***Cognitive and informative:*** *Dizziness, hole, slip, a stone you slide. E181* ***Evaluative and affective:*** *On the street, it's very dangerous! I'm already 90 years old, it's not a day, right?! E111*
Culture, values, beliefs	***Behavioral and attitudinal:*** *We can slip, we can stumble. E149* ***Cognitive and informative:*** *I fell again (recurring fall) and it was where I had already broken. E111 There are people who are not careful and throw their garbage anywhere. It obstructs the sidewalks. E188* ***Evaluative and affective:*** *I think stumbling is dangerous... E119* ***Objective and imagetic:*** *We stumble over a hole in the street. E154*		***Behavioral and attitudinal:*** *It is very hard for me to go out on the street, because I hardly ever leave the house E114. I've fell on the street! I went up a little step for nothing, lost control and fell E148.* ***Cognitive and informative:*** *I'm worried about things; I don't pay attention and I might fall E155* ***Evaluative and affective:*** *It's hard to fall. E165* ***Objective and imagetic:*** *We look like children when we fall.E165*

Chart 1 – Dendogram and circle chart of representational contents with fragments of speeches. Juiz de Fora, Minas Gerais, Brazil, 2022

	CATEGORY 1 – Peridomicile: fallscenario	CATEGORY 2 – Aging and vulnerability: risk of fall in peridomicile
Political and legal	***Behavioral and attitudinal:*** *I might stumble or slip on a stone... E126.* ***Cognitive and informative:*** *I am afraid of falling in the street. 65189 On the street, it is dangerous E142.* ***Evaluative and affective:*** *Our city is very badly paved; there are some very bad sidewalks, steps a little high. When I get on or off the bus, it's very awkward. I can fell. E182 Especially with a few holes we found along the way, which are many! E128* ***Objective and imagetic:****These stones and these holes there are many on the streets. E180*	***Behavioral and attitudinal:*** *I'm afraid of falling in the street. E189.* ***Cognitive and informative:*** *I think stumbling is dangerous E119.*
Economic factors	***Behavioral and attitudinal:*** *Because of holes and uneven sidewalks. E140I fell because I got off the bus and didn't look at the ground. E180. Those pathways, if you're not careful, you fall. E119* ***Cognitive and informative:****On the street, it's the place where you fall the most. E127 The hole in the street is dangerous. E126* ***Evaluative and affective:*** *These sidewalks have a lot of holes. E154* ***Objective and imagetic:****The terrain here is clay, when it rains, it gets very slippery, I slipped and sat (hit) my back on the ground... E130*	***Behavioral and attitudinal:*** *The sidewalk was too high, I lifted my foot to climb up, but it didn't work, so I fell. E166* ***Cognitive and informative:*** *Sometimes I run to catch the bus, it's crazy! I know I shouldn't do this! After I stop to think. E182* ***Objective and imagetic:*** *I think it was from that fall. Today I have a little back problem, I think that's why. E189.*
Origins	***Own origin linked to the environmental infrastructure of streets and sidewalks:*** *Stumbling or slipping on a stone in the street and sidewalks E126. Those walk things, if you're not careful, you really fall. E119 But the street is very dangerous. E189 Store carpet is dangerous E165.There are these stones and these holes, that's what there are most on the streets E186. I'm afraid of these ramps on the street E167.I was coming down the hill and it had a slope E181.* ***Own origin linked to the hygiene of public way:*** *Or stepping on banana peel, on jabuticaba peel or on some food that the peel is slippery. There are people not careful and throw their garbage anywhere. E188*	***Own origin linked to the elderly person's behavior on public ways:*** *Sometimes I run to catch the bus, it's crazy! I know I shouldn't do this! After I stop to thinkE189. I can fall, but I do everything not to fall E180. I came with the cane and went up there, we can see little. Instead of placing the cane on the step, I placed it on the front step E148.* ***Origin from third parties and own linked to balance and morbidity of the elderly:*** *It happens like this: Dizziness, hole, slip, a little stone that you slide. E181* ***Own origin linked to vision/balance:*** *Leaving a light environment and moving to a dark one causes a drop in vision. I think I might fall E168.I fell. I went down 17 steps rolling E154.*

Chart 1 – Cont.
Source: Research data.

Table 1 – Vulnerability for falls in the peridomicile measured from self-perception according to categories "non-faller" and "faller". Juiz de Fora, Minas Gerais, Brazil, 2022

Variable ofinterest	Activity measured for the situation in the peridomicile				X^2
	Non-faller people		Faller people		
	N	%	N	%	
Carpet	23	46	27	54	0.429
Absenceofsafety bar	9	40.9	13	59.1	0.220
Poorlighting	46	50.5	45	59.5	0.823
Slipperyfloor	25	43.9	32	56.1	0.157
Steps/unevenfloor/holes	70	55.1	54	44.9	0.040
Stairs	47	52.2	43	47.8	0.580
Absenceofhandrails	24	57.1	18	42.9	0.370
Manyenvironmentalobjects	4	26.7	11	73.3	0.040
Path withobstacles	13	50	13	50	0.884
Placeto shop	49	52.7	44	47.3	0.670
Slopes	42	48.3	45	51.7	0.373
Absence of support for locomotion	21	51.2	20	48.8	0.991

Note: X^2 – Chi-square test.
Source: Data from the matrix research, 2017.

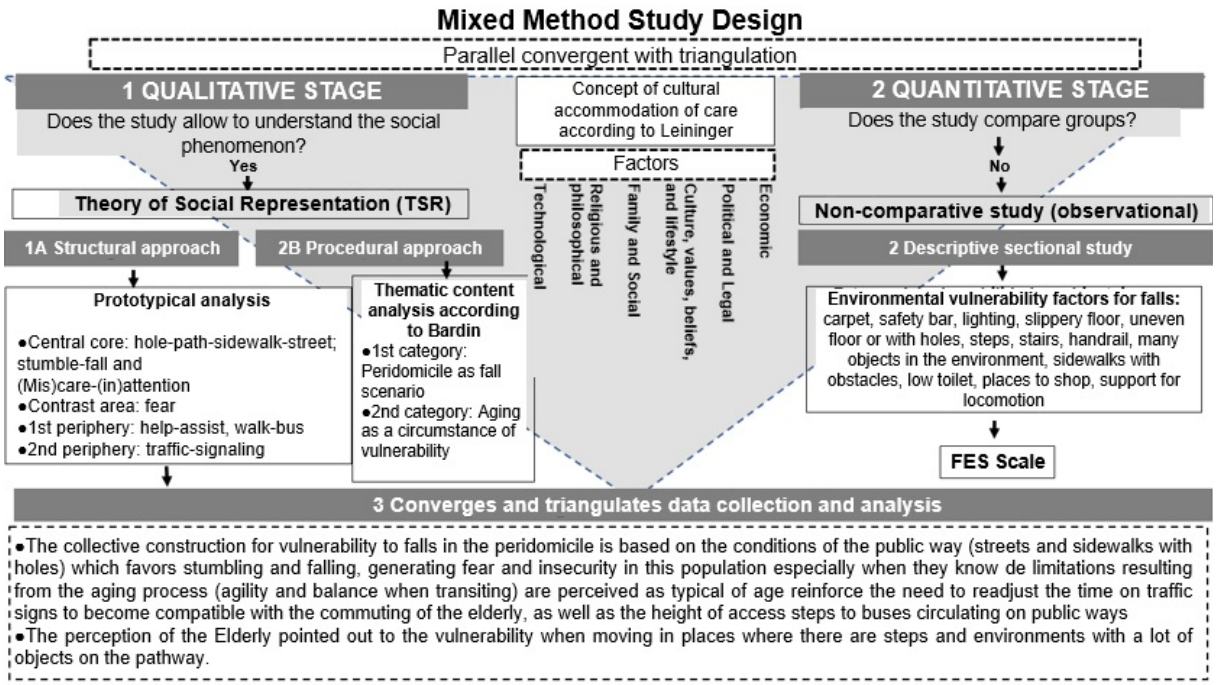


Figure 3 – Synthesis of the results.Juiz de Fora, Minas Gerais, Brazil, 2022
Source: The authors.

DISCUSSION

The profile of the participants was corroborated with the process of feminization of aging, since women tend to engage more intensely in healthy lifestyle habits, although they were more vulnerable to fall when compared to men[26]. The high variability of the identified age range configures the phenomenon of age dechronologization portrayed by the diversity of activities performed in the peridomiciliary environment, which indicates that age is not the only marker for the stages of life[26]. Skin color was justified by the fact that these people were German immigrants. The infrastructure of the urban peridomiciliary environment is consistent with the economic profile of the participants.

In a study conducted with 16,393 elderly Chinese residents of both urban (51.4%) and rural (48.6%) areas, it was verified that falls in the peridomicile occurred on sidewalks and pathways and in backyards respectively[27]. There are recommendations for cities to be designed and adapted to ensure quality of life[28], aligning public policies, urban development and safe space for people, with: level sidewalks, ramps beyond ford sidewalks, made from holes in the streets and sidewalks, signaling for steps, removal of debris/garbage and orderly occupation of public ways[29].

The National Urban Mobility Policy (NUMP) in Brazil advocates universal accessibility, safety in circulation and equity in the use of public circulation space, pathways and public areas[29]. When comparing the guidelines with the present investigation, it is possible to infer that the architectural environment around the investigated individuals' peridomicile is unfavorable regarding: accessibility, leveling of sidewalks and streets; obstruction, cleanliness of public ways and appropriate timing of traffic lights[3,27]. This fact hinders the free flow of people and their displacement in a timely manner when there is mobility deficit[27,30]. Regarding sloping and mountainous terrain, there is a need for control between public policies, urban development and accessibility conditions, with recommendation to consider the presence of elderly people in urban space planning[3]. The intense flow of people in places of circulation can favor bumps, loss of balance and cause falls[4,30].

The representational object was anchored in the conditions of the public way, in the presence of diseases or changes in balance and in the way of attention and care that the elderly adopt on the public way, where they recognize risk factors and feel threatened.

The social representation of the elderly based on the characteristics of the peridomicile was also anchored in manifestations of the geriatric syndrome, when there is shortening of steps, walking with support on the tip of the foot, reduced balance, and loss of muscle tone and mass[21]. Additionally, the type of footwear can also lead to postural instability, a feeling of imbalance and fear of walking[4,30,31].

In aging, there is a prevalence of foot problems (71% to 87%) resulting from changes in biomechanics, structure and functionality until generating pain and compromising quality of life and balance; the use of inappropriate footwear intensifies the risk of falls[11]. The insecurity and fear of stumbling and falling can be explained by factors such as: decreased agility and balance; morbidities and/or medications that can compromise autonomy, which requires readjusting the time of traffic lights[2,3]. Another factor is the sarcopenia syndrome and the instability to move in places where there are steps whose height requires more muscle support to stabilization, such as, for example, the steps of public transport[27].

The occurrence of trauma because of accidents in Brazil represents the third cause for mortality from external causes in all age groups, surpassed only by mortality from cardiovascular and neoplastic diseases. Accidents from falls in urban spaces in elderly people have consequences, such as more intense physical and emotional damage, such as those arising from the inadequacy of the infrastructure around bus stops[30–32].

Although poor lighting was not a component associated with falls in the present research, it was mentioned in other studies[28,31,32] and vision adaptation to different light levels was highlighted as a cause of falls. The recommendation to reduce architectural barriers to reduce the social isolation of elderly people means improving accessibility in urban environments and in the general health status of these people, addressing symptoms of anxiety and depression[32].

The "fear" of falling is also connected to the name "dependence", resulting from the name "disease-imbalance", portraying the functions of knowledge, identity, orientation and justification for the fall, and appears as part of the manifestations of geriatric syndrome described in the literature[21]. There is evidence of an association between perceived accessibility and environmental conditions in the experiences of elderly people[2].

The results of the collective representations and predictors of the self-perception of falls lead to a perspective of culturally congruent care[16] in the educational; political and legal; technological and economic dimensions. These dimensions must be considered in the cultural and social structure of the urban context.

Although the peridomicile is recognized by social subjects as an environment of risk, the motivation to be exposed to it is justified by the technological; religious; social; cultural dimensions and ways of life and education according to Leininger[16]. Therefore, it is necessary to remodel ways of life; insertion of assistive technologies for people with walking difficulties; public policies that make the urban environment safe and adjust the timing of traffic lights to become compatible with the movement of elderly people around their peridomicile.

This research brings possibilities for nurses to act based on culturally congruent care for elderly people at risk of falls in the peridomicile. Professional practices must observe the structure of the peridomicile, autonomy, independence and safety of the elderly. The simultaneous approach to the individual and collective dimensions encompasses priority areas of nursing activity: interactional (transcultural accommodation of care), technical (inclusion of compatible assistive technologies), political (architectural characteristics of the peridomicile) and educational (adoption of behaviors for fall prevention).

The study, by using quantitative and qualitative evidence, relating the falls of elderly people in the peridomicile with the architectural accessibility of environments, contributes to the improvement of knowledge on the subject. It presents reflections from a public health perspective, since the highlighted elements transit in interdisciplinary areas.

The importance of an evaluation centered on the individual makes nurses, when caring for the elderly at the primary health care, consider in their clients routine habits, walking posture, customs, sociocultural context and infrastructure of the urban environment in which the elderly person transits and is inserted. These are intervening components in the risk of falls among elderly people, since this is a common event that causes morbidity and mortality, which negatively impacts the autonomy, independence and quality of life of the elderly person. Considering this perspective in the stages of the nursing consultation for the elderly is essential for the training of nurses and for the exercise of their professional practice.

When analyzing the demographic and epidemiological transition of the human aging process, combined with studies focused on physiological aspects of falls, the contribution of the present research stands out, which highlights the peridomiciliary context as an environmental and cultural factor associated with the risk of falls. These components allow us to suggest reflections on the management of the reorganization and safety of public spaces. The study also adds a nursing framework that includes culturally congruent care to predict the occurrence of falls among elderly people.

The use of only one scale, the FES, to identify elderly people who fall is a limitation of this research. Therefore, it is recommended to conduct new studies that make use of other concomitant scales to encompass the biophysiological dimension, considering that the FES allows a prediction of falls based on two constructs, fear and activities of daily living, with falls among the elderly a complication that has a multifactorial etiology.

CONCLUSION

It was possible to show the association between the peridomiciliary architectural environment and the predictive characteristics of the risk of falls among elderly people. The structural conditions perceived in the peridomiciliary context were uneven floors, holes, unevenness, and many objects in the pathway. Its implications in the representation of falls among the elderly showed a strong relationship with the findings of the study. The peridomicile can be an impactful environment in the life of the elderly person when its environmental characteristics have a strong influence on the occurrence of accidents on public ways.

The collective construction about vulnerability to falls in the peridomicile by elderly people was based on the conditions of the public way, with streets and sidewalks with holes, which predispose to stumbling and falling, generating fear and insecurity in this population. There is also vulnerability in places with steps and environments with many objects on the way. Limitations resulting from the aging process (lack and/or decrease in agility and balance when transiting) perceived as typical of age reinforce the need to readjust the time on traffic signs to become compatible with the commuting of the elderly, as well as the height of access steps to buses circulating on public ways.

The participants have a perception of the peridomicile in which they are situated, and they recognize the limitations of infrastructure, based on the conditions of public life. As a result, there was fear due to illness, slow mobility when crossing streets with traffic lights, imbalance when getting on or off buses, due to pushing or obstructed sidewalks. These conditions make social actors to perceive their own limitations and recognize the need for help in case of falls.

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