

Original Article

Santos AA, Menezes TMO, Farias MTD, Nunes AMPT, Goés RP, Pires AVS, et al.
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Rev Gaúcha Enferm. 2026;47:e20250203.
<https://doi.org/10.1590/1983-1447.2026.20250203.en>

Development of an indicator matrix for the quality of care for older adults in emergencies

Desenvolvimento de uma matriz de indicadores para qualidade do atendimento à pessoa idosa em emergências

Desarrollo de una matriz de indicadores de calidad de la atención a las personas mayores en situaciones de emergencia

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How to cite this article:

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ABSTRACT

Objective: To develop an indicator matrix to assess the quality of care provided to older adults in Emergency Care Units.

Method: Applied methodological study, conducted in three stages, between September 2023 and March 2024: Bibliographic survey and selection of structuring foundations; Development

of the analysis and judgment matrix; Content validation by a panel of experts (16), using the *Delphi* technique, calculating the Agreement Rate and the Content Validity Index.

Results: At the end of the two rounds, the matrix showed an overall agreement of 0.94. As for the Content Validity Index, the mean values were 0.95 in the first round and 0.93 in the second round. After adjustments recommended by the expert judges and the reallocation of 2 indicators between the process and outcome dimensions, the matrix comprised 16 items, distributed as follows: structure (n=7), process (n=3), and outcome (n=6).

Conclusion: The matrix was conceptually validated to measure the quality of care for older adults in Emergency Care Units and to capture specific aspects across the three dimensions addressed. It proved to be a technology capable of supporting managers and professionals in decision-making, enabling continuous, sustainable improvement in the quality of care for the older population.

Descriptors: Older adults; Emergency medical services; Quality of health care; Health care quality indicators; Validation study.

RESUMO

Objetivo: Desenvolver uma matriz de indicadores para avaliar a qualidade do atendimento à pessoa idosa nas Unidades de Pronto Atendimento.

Método: Estudo metodológico aplicado, conduzido em três etapas, entre setembro de 2023 e março de 2024: Levantamento bibliográfico e seleção dos fundamentos estruturantes; Desenvolvimento da matriz de análise e julgamento; Validação de conteúdo por um painel de juízes (16), por meio da técnica *Delphi*, calculando-se a Taxa de Concordância e o Índice de Validade de Conteúdo.

Resultados: Ao final das duas rodadas, a matriz apresentou uma concordância global de 0,94. Quanto ao Índice de Validade de Conteúdo, os valores médios foram de 0,95 na primeira e de 0,93 na segunda rodadas. Após ajustes recomendados pelos juízes e a realocação de dois indicadores entre as dimensões processo e resultado, a matriz contabilizou 16 itens, distribuídos em: estrutura (n=7), processo (n=3) e resultado (n=6).

Conclusão: A matriz foi validada conceitualmente para mensurar a qualidade do atendimento à pessoa idosa nas Unidades de Pronto Atendimento, bem como para captar aspectos específicos nas três dimensões abordadas. Observa-se que a matriz é capaz de subsidiar gestores e profissionais no processo de tomada de decisões, possibilitando a melhoria contínua e sustentável da qualidade da atenção à população idosa.

Descritores: Idoso. Serviços médicos de emergência. Qualidade dos serviços de saúde. Indicadores de Qualidade em Assistência à Saúde. Estudo de validação.

RESUMEN

Objetivo: Desarrollar una matriz de indicadores para evaluar la calidad de la atención a la persona mayor en las Unidades de Atención de Urgencia.

Método: Estudio metodológico aplicado, realizado en tres etapas, entre septiembre de 2023 y marzo de 2024: Levantamiento bibliográfico y selección de fundamentos estructurantes; Elaboración de la matriz de análisis y juzgamiento; Validación de contenido por un panel de jueces (16), utilizando la técnica *Delphi*, calculando la Tasa de Concordancia y el Índice de Validez de Contenido.

Resultados: Al final de las dos rondas, la matriz mostró una concordancia general de 0,94. En cuanto al Índice de Validez de Contenido, los valores promedio fueron de 0,95 en la primera

ronda y de 0,93 en la segunda. Tras los ajustes recomendados por los jueces y la reasignación de dos indicadores entre las dimensiones de proceso y de resultado, la matriz contabilizó 16 ítems, distribuidos de la siguiente manera: estructura (n=7), proceso (n=3) y resultado (n=6).

Conclusión: La matriz se validó conceptualmente para medir la calidad de la atención a las personas mayores en unidades de urgencias, así como para captar aspectos específicos de las tres dimensiones abordadas. Se observa que la matriz puede apoyar a gestores y profesionales en el proceso de toma de decisiones, lo que posibilita la mejora continua y sostenible de la calidad de la atención a la población mayor.

Descriptores: Persona mayor; Servicios médicos de urgencia; Calidad de los servicios de salud; Indicadores de calidad de la atención en salud; Estudio de validación.

INTRODUCTION

The increase in life expectancy of the population has been observed on a global scale. A demographic inversion is evident due to the continuous decline in birth rates, illustrated by an age pyramid with a narrowed base and a widened top, assuming a barrel-shaped form⁽¹⁾. According to the World Health Organization (WHO), between 2015 and 2050, the world population aged 60 or over is expected to practically double, going from about 12% to approximately 22%⁽²⁾.

Although the growth of this population group is more pronounced in developed countries, Brazil presents a similar phenomenon, with an exponential increase of 29.9 million people⁽³⁾. Demographic changes in the national scenario project a proportion of older adults (60 years or older) of around 37.8% by the year 2070⁽³⁾.

Given the above, there is an increase in the flow of older adults in emergency services, whose search for care occurs due to the exacerbation of their pathological history, aggravated by the low problem-solving capacity of Primary Health Care (PHC) in managing chronic conditions⁽⁴⁾. Studies reveal that aging, associated with the high prevalence of Noncommunicable Chronic Diseases (NCDs) and other conditions that lead to declines during senescence, results in the decompensation of preexisting conditions, thereby intensifying the demand for emergency services⁽⁵⁾.

In this perspective, the 24-hour Emergency Care Unit (UPA 24h) emerges as an important entry point for emergency care, integrating the Emergency Care Network (ECN). These units have physical and technological infrastructure of intermediate complexity, as well as specialized multidisciplinary teams, acting as support for acute PHC cases and stabilizing more critical cases for subsequent referral to the hospital network through medical regulation⁽⁶⁾.

Although the UPA 24h was conceived as a strategy to reduce overcrowding at hospital emergency departments and to optimize integration with the healthcare network, recent studies

indicate that these units are overcrowded, with disorganized population access, and face regulatory difficulties, particularly in referring older adults to the hospital network⁽⁷⁻⁸⁾. It can therefore be inferred that this population is more susceptible to weaknesses in care, which are exacerbated by the complexity of their clinical profile, whose management requires a qualified and specialized approach, especially in urgent and emergency contexts⁽⁷⁻⁹⁾.

These limitations reinforce the need to assess the quality of care provided in UPA 24h units, particularly regarding care for older adults, through care indicators. The adoption of Donabedian's Triad (structure, process, and outcome)⁽¹⁰⁾ allows for a systematic and measurable evaluation, translating resources, practices and outcomes into concrete indicators. This approach was recently used in a study evaluating quality in PHC, urgent/emergency, and hospital services within the context of the Unified Health System (*Sistema Único de Saúde - SUS*)⁽⁷⁾. In this context, the regulation and monitoring of public health services recommend the application of quality indicators for auditing and control of care⁽¹¹⁾, which legitimizes the theoretical and methodological option adopted.

In the same direction, health evaluation identifies the weaknesses and potential of services, guiding strategies for continuous and sustainable improvement⁽¹¹⁻¹²⁾. Although the Ministry of Health (MH) monitors the performance of the ECN through evaluative tools, recent studies point to a fragmented process, centered on the isolated evaluation of services⁽¹²⁻¹³⁾. Furthermore, this study is justified by the need and importance of proposing an integrated evaluation of the quality of care for older adults in UPA 24h units, considering indicators distributed across the three Donabedian dimensions.

Thus, the developed matrix is configured as an innovative evaluative technology for improving healthcare through the quality attribute. Within the scope of this research, the following questions emerge: is the developed matrix capable of evaluating the quality of care for older adults in UPA 24h units? The study is based on the hypotheses that (i) the instrument presents consistency in content validation and (ii) its indicators measure aspects embedded in the structure, process, and outcome dimensions⁽¹⁰⁾.

The relevance of this study lies in proposing an evaluative technology that allows measuring the quality of care for the elderly in UPA 24h, contributing to the improvement of management and the strengthening of the ECN. Thus, the objective of this research was to develop an indicator matrix to assess the quality of care provided to older adults in UPA 24h units.

METHOD

Type of study

This is an applied methodological study aimed at developing an indicator matrix to assess the quality of care provided to older adults in UPA 24h. The study was conducted from September 2023 to March 2024, in three stages: Literature review and selection of structuring references; Development of the evaluative indicator and judgment matrix; Content validation (CV) of the matrix by a panel of experts using the Delphi technique⁽¹⁴⁻¹⁵⁾, calculating the Agreement Rate (AR) and the Content Validity Index (CVI).

Applied methodological studies are characterized by the development, adaptation, validation, or improvement of instruments or technologies intended to measure constructs, evaluate processes, and qualify healthcare practices. Such studies have been increasingly used in the field of nursing and health evaluation⁽¹⁶⁻¹⁷⁾.

Content validation, in turn, constitutes a stage of the methodological study, as it allows verification of the degree of representativeness, relevance, and clarity of the indicators in relation to the construct intended to be measured. This process is conducted by experts in the field, who assess whether the items adequately and sufficiently reflect the proposed theoretical dimensions⁽¹⁸⁻¹⁹⁾.

In this study, the evaluative matrix was conceived as an evaluative technology of a conceptual and normative nature, structured based on Donabedian's triad⁽¹⁰⁾, integrating scientific evidence, guidelines, and expert judgment. Thus, the adopted design follows recommendations for methodological studies in health, which aim to confirm theoretical validity and internal consistency for use in real-world care practice and public health management contexts.

Research site

The study was conducted in three different UPA 24h, located in a specific capital city in the Northeast region of Brazil. This setting was chosen due to the significant local population, estimated at approximately 2.4 million inhabitants. The installed capacity of the network was also considered, which includes 11 level III UPA 24h, a number approximately three times higher than the coverage recommended for this level of care⁽⁶⁾.

The services included are representative within the context of the ECN, allowing the definition of parameters to evaluate the quality of care for the elderly in a real-world setting. To this end, a normative evaluation was carried out, in which the situation observed in the UPA 24h, considering dimensions of structure, process, and outcome, was compared to explicit

standards defined by national guidelines and SUS regulations applicable to emergency services.

Based on this evaluation, judgments of conformity were derived by comparing current practices with the regulatory frameworks that guide the organization of the ECN. In this context, the normative evaluation was configured as a strategy to verify recognized quality standards⁽²⁰⁾, based on indicators structured according to the Donabedian model, especially in recent research analyzing the quality of health services in Brazil⁽⁷⁾.

1st Stage: Literature review and selection of structuring references

To support the construction of the evaluative matrix, a literature review was conducted to ground the concepts of comprehensive healthcare for older adults, health evaluation, CV, and Donabedian's Triad. Technical documents from the MH⁽⁶⁾, were consulted, in addition to discussions with managers and visits to the UPA 24h, to relate the documentary analysis to the Donabedian dimensions⁽¹⁰⁾.

The normative evaluation stage, guided by a structured script, examined, in an integrated way, the domains of structure, process and outcome within the UPA 24h context, which allowed identifying the priority needs of older adults within the scope of the ECN and subsequently to define the elements to be measured. On-site verification allowed assessment of the conformity of resources, care flows, and professional practices with current guidelines and, in an articulated manner, supported the selection of evaluative questions and indicators by dimension.

Concurrently, a scoping review was conducted between September and November 2022. The systematic search was carried out in the following databases: Virtual Health Library (VHL), Web of Science, PubMed, Scopus, CINAHL, and Cochrane. Inclusion criteria comprised full-text articles published between 2007 and 2022 in Portuguese, English, and Spanish that addressed the quality of care for older adults in urgent and emergency services. The final sample consisted of seven studies, whose most relevant findings indicated weaknesses in care for older adults in UPA 24h units, notably the lack of integration within the Health Care Network (HCN), high user demand, and the absence of risk management⁽²¹⁾.

Furthermore, issues related to the comprehensiveness of the HCN, structural inadequacies of the UPA 24h, user satisfaction with response time, and the need to sensitize the nursing team due to high demand, exposure to fall risks and opportunistic infections, and the lack of protocols and/or service evaluation instruments were identified⁽²¹⁾. The quality of care was addressed in an incipient manner in these studies, however, all findings were

considered relevant to support the construction of the evaluative matrix, ensuring that the instrument addressed the critical areas identified in practice.

2nd Stage: Development of the evaluative indicator matrix

Based on the literature review, the conceptual properties of the construct were established, as well as the structuring of the dimensions and items of the evaluative matrix. The definition and organization of the items/indicators were based on guidelines and principles of the UPA 24h component, established in MH regulations (6).

Donabedian's triad defined the construction and distribution of the matrix indicators⁽¹⁰⁾. Thus, the matrix was developed with 16 indicators, grouped into the following dimensions: Structure (7), Process (3) and Outcome (6). Furthermore, three attributes were considered for each indicator and dimension: (i) adequacy: to assess whether the indicator was appropriate for its objective and respective dimension; (ii) relevance: which assessed the relevance of the indicator for assessing the quality of care for older adults in UPA 24h; and (iii) clarity: to verify whether the concept and premises were understood and clearly expressed what was intended to be measured.

For methodological purposes, this research followed these sub-stages: (1) definition of focus; (2) selection of experts; (3) questionnaire structuring; (4) consultation rounds; (5) consolidation of results; and (6) presentation of the developed matrix⁽¹⁶⁻¹⁷⁾.

The study began with the definition of the construct and psychometric objectives of the instrument. Next, experts with experience and recognized expertise in the subject and in instrument validation were selected. The questionnaires were structured, reviewed, and adapted to the target audience. The two rounds allowed us to obtain the CV, as well as to collect suggestions for refinement, the results of which were consolidated by calculating the CVI and the AR. Finally, the methodological path, obtained indices, and the potential applications of the validated instrument were presented.

3rd Stage: Content validation of the matrix by a panel of judges

The selection of expert judges started with an online search on the Lattes Platform, in the "subject" tab, using the following terms: Public health service management; Emergency and Urgent Care Network; Older adults and quality of healthcare services. The search identified 10 professionals with profiles compatible with the inclusion criteria. Then, the snowball sampling technique was applied⁽²²⁾, which indicated another 20 experts, thus increasing the total number of eligible participants to 30. The formal invitation was sent to all selected expert

judges, of whom 16 agreed to participate and composed the panel for the first round of content validation.

Inclusion criteria for the judges were: working in public health management, teaching and/or research at public universities in the fields of the Emergency Care Network, older adults, and health service quality, with a minimum of six months of experience in the role. Judges were excluded if they: (i) did not complete all stages of content validation; (ii) had conflicts of interest with the study; or (iii) failed to return the research instrument within the stipulated deadline.

The expert judges were contacted by email, and the Informed Consent Form (ICF) and the evaluation matrix, available on the Tyforms®, platform, were attached, with a 7-day deadline for return. Initially, 20 experts were defined, of whom 17 signed the ICF, confirming their participation. Finally, the panel comprised 16 experts who completed the content validation phase of the instrument. This number aligns with the scientific literature, which recommends a total of 10 to 30 specialists for panel composition⁽¹⁶⁾.

The instrument was presented to the experts in a semi-structured format, containing the title, instructions for completion, and a space for suggestions, criticisms, and comments. CV of the instrument was carried out in 2 phases⁽¹⁶⁻¹⁷⁾: the first assessed the dimensions of the matrix, and the second used a 5-point Likert-type ordinal scale ⁽¹⁶⁻¹⁹⁾, with the following levels: (5) strongly agree; (4) agree; (3) neither agree nor disagree; (2) disagree; and (1) strongly disagree. Concurrently, the items/indicators were evaluated according to the criteria of (i) appearance, (ii) applicability, (iii) clarity, (iv) readability, and (v) organization of the instrument.

Statistical evaluation was performed using the CVI, whose score was calculated by summing the “Strongly agree” and “Agree” responses of each expert and dividing by the total number of responses. The instrument’s validation was achieved through evidence extracted by the Delphi technique, which, after two rounds, obtained the consensus of the experts, ensuring methodological adequacy⁽¹⁴⁻¹⁵⁾. The agreement between the experts was assessed by the AR, with a cutoff point equal to or above 0.80, as recommended in recent studies⁽¹⁶⁻¹⁸⁾.

It should be noted that, for this study, no cutoff was adopted for the number of indicators to classify them as poor, regular, good, or excellent for defining overall quality. Instead, the 5-point Likert scale was applied, allowing analysis of responses according to the experts’ evaluation, with options 1 and 2 grouped as +1 and options 3 to 5 as –1. Using this recoding, agreement means ranging from –1 to +1 were calculated, identifying the degree of alignment among experts for each indicator. Therefore, the global evaluation did not depend on the simple

sum of categories but on the statistical interpretation of the mean agreement scores assigned to the instrument.

To analyze qualitative aspects, expert comments were organized in an Excel® spreadsheet, grouped by dimension and their respective indicators, as well as by clarity, relevance, and adequacy. Data were cataloged as comments and contributions, defined as “applicable” or “not applicable,” with applicable contributions incorporated into the improvement of the matrix.

The parameters for each indicator were defined based on targets and standards established in Ministry of Health ordinances regulating the UPA 24h component within the ECN, as well as municipal management contracts establishing operational and care-related goals. This definition was supported by the bibliographic and regulatory review conducted in the first stage of the study, which gathered scientific evidence and official guidelines that informed the construction and parameterization of the evaluative matrix.

Ethical aspects

The study was submitted to the Research Ethics Committee of the School of Nursing at the *Universidade Federal da Bahia* and approved under opinion No. 6,271,357 on August 30, 2023. All procedures validated in the study comply with current ethical guidelines ⁽²³⁾.

RESULTS

The CV stage of the research considered the CVI of the matrix, with the participation of 16 experts in the first round and nine in the second, among whom 4 were professors and 5 were managers. This allowed a thorough analysis of the indicators through conceptual and methodological validation of the instrument.

Regarding education and qualification of the sample, 50% held a master's degree, 38% a doctorate, and 12% a specialization. The sample consisted predominantly of nurses (81%), with a 50% parity between professors and public managers from various levels of care, of whom 44% of whom were affiliated with Health Departments. The professional experience of the experts ranged from 5 to 25 years. Therefore, the matrix was submitted to the expert judges for evaluation, and its results were obtained by calculating the statistical scores of AR and CVI.

In the first round of the CV, the instrument achieved an overall AR of 0.97, with its dimensions as follows: Structure 0.98, Process 0.98, and Outcome 0.94. Regarding the aspects of adequacy, relevance, and clarity across the three dimensions of the instrument, an AR above 0.91 was observed in all dimensions, indicating consistent agreement among the experts.

It should be noted that the AR assessment was calculated based on (n=15) responses for most items, as one of the evaluators only met the adequacy criterion, which made it impossible to apply the complete methodology for this purpose. However, all aspects assessed in the first round presented a AR above 0.80.

As for the overall CVI, the matrix reached 0.95, reinforcing satisfactory convergence between the experts' responses and the instrument's content. The Structure, Process, and Outcome dimensions showed CVIs of 0.95, 0.98, and 0.93, respectively, suggesting alignment with the matrix's initial design.

Considering the quantitative assessment, the matrix had all its indicators and dimensions validated ($CVI \geq 0.80$) in the first round. However, the qualitative contributions of the experts motivated a second application of the instrument, which incorporated the suggested refinements.

After statistical analysis of the responses, the experts' comments were examined qualitatively, totaling (n=145) records, of which (n=78) referred to the indicators of the Structure dimension; (n=26) to the Process dimension; and (n=41) to the Outcome dimension. However, most comments (n=106) focused on healthcare services, including criticisms and suggestions for improvement. Of the comments directed at the instrument itself, n=39 suggested ways to optimize it.

Following the first refinement, the applicability of relevant criticisms and suggestions was evaluated, considering data availability limitations or legal constraints. Ultimately, nine applicable contributions were identified, which were crucial for submitting the eight indicators most highlighted by the experts to a second round of CV.

In the second round, the number of participants decreased from n=15 to n=9, despite granting three extensions for response submission. This reduction is expected in studies involving instrument validation and does not compromise the quality of the expert panel or the execution of methodological steps.

In this round, the instrument presented a overall AR of 0.94, with dimensions distributed as follows: Structure 0.99, Process 0.96, and Outcome 0.88. The global CVI reached 0.93, with Structure at 0.95, Process at 0.96, and Outcome at 0.90. A comparative analysis of data from both rounds showed that the instrument maintained its statistical scores above the established cutoff across all three evaluative dimensions and overall, indicating that the new expert assessment validated the matrix.

However, an increase in AR values was observed for three indicators, confirming their relevance and the importance of retaining them in the instrument, according to the experts. The

indicators with increased AR were: (i) Diagnostic resources (ECG, X-ray, and laboratory) – Structure, which increased from 0.93 to 1.0; (ii) Percentage of return visits to the emergency department within 72 hours for the same cause – Process, which rose from 0.93 to 1.0; and (iii) Percentage of stays over 24 hours in the UPA 24h – Outcome, which decreased slightly from 0.98 to 0.96.

Conversely, the Outcome dimension showed a slight decrease in the AR, from 0.94 to 0.88, attributed to the lower agreement obtained by two indicators: (i) Percentage of elderly eligible for the Home Care Service (HCS) under observation in the UPA 24h; and (ii) Percentage of user/elderly person satisfaction. Both decreased from 1.0 to 0.78, considering the AR of the Outcome dimension. Even so, this dimension maintained a AR of 0.88, remaining above the cutoff point of 0.80 established by the study.

Regarding CVI calculation in the second round, three indicators showed statistical improvement: (i) Percentage of older adults attended in UPA 24h – Structure, from 0.93 to 0.96; (ii) Percentage of return visits to the emergency department within 72 hours for the same cause – Process, from 0.93 to 1.0; and (iii) Percentage of stays over 24 hours in the UPA 24h – Outcome, from 0.88 to 0.96.

To evaluate the quality of care provided to older adults in the UPA 24h, the indicators in the matrix were classified into four categories: poor, fair, good, and excellent, according to targets defined by experts. For global interpretation, a synthesis criterion was adopted based on the predominance of these categories: quality is considered satisfactory when most indicators fall into “good” and “excellent,” fair when “fair” predominates, and unsatisfactory when a greater proportion falls into “poor”.

Given this context and considering that the instrument was approved in the first round while the second round focused on refining terminologies and parameters, as well as characterizing the indicators and their assumptions, the final version of the instrument was chosen, with the best CVI among the two rounds (Chart 1).

Chart 1 – Indicator matrix to evaluate the quality of care provided to older adults in the Emergency Care Unit. Salvador, Bahia. Brazil, 2025.

DIMENSION	INDICATOR	EVALUATIVE QUESTION	GOAL	EVALUATIVE PARAMETERS
STRUCTURE	Estimated percentage of population coverage in the	What is the coverage percentage of	Coverage $\geq$ 80% of PHC for the population assigned to the UPA 24h	Poor: 0 to 25%; Fair: 26 to 50%; Good: 51 to 75% and

municipality's PHC	BHU/FHS in the municipality?		Excellent: 75% to 100%
Percentage of proportional coverage of UPA 24h in the municipality	What is the coverage percentage of UPA 24h in the municipality?	Coverage $\geq$ 80% of UPA 24h for municipalities with more than 50,000 inhabitants	Poor: 0 to 25%; Fair: 26 to 50%; Good: 51 to 75% and Excellent: 75% to 100%
Number of ACCR rooms per UPA 24h	What is the number of ACCR rooms per UPA 24h?	UPA 24h type III: 2 rooms; type II: 1–2 rooms; type I: 1 risk-classified reception room	Below required for the unit type: Poor; Meets requirement: Good; Above minimum requirement: Excellent
Number of physicians per UPA 24h	What is the minimum number of physicians required for UPA 24h care?	Type III UPA 24h: 9 physicians (5-day, 4 night); Type II: 6 physicians per shift; Type I: 4 physicians per shift	Below the requirement for the unit's size: Poor. Equal to the requirement for the unit's size: Good. Above the minimum required for the unit's size: Excellent.
Number of nurses per UPA 24h	What is the minimum number of nurses required for UPA 24h care?	Minimum of 5 nurses required regardless of UPA size	Poor. Equal to the requirement for the unit's size: Good. Above the minimum required for the unit's size: Excellent.

	Percentage of older adults treated in UPA 24h	What percentage of patients in UPA 24h are elderly?	Expected percentage: 25% of total UPA 24h care	Poor: 0 to 15%; Fair: 16 to 40%; Good: 41% to 75% and Excellent: 76% to 100%
	Diagnostic resources (ECG, X-ray, laboratory)	What is the number of diagnostic resources available in UPA 24h?	Diagnostic resource (01 room and 01 ECG equipment; 01 imaging room/01 X-ray equipment, 01 collection room and 01 room for processing laboratory tests).	Poor: 0 or 1 resource available; Fair: 2 resources available; Good: 3 resources available; Excellent: 4 resources available.
PROCESS	Percentage of UPA 24h using standardized risk classification protocol	How many UPA 24h use a standardized risk classification protocol?	Standardized in 100% of UPA 24h	Poor: 0% to 25%; Fair: 26% to 50%; Good: 51% to 75%; Excellent: 76% to 100%.
	Percentage of decision-making within 6 hours	What percentage of decisions are made within 6 hours?	≥ 90% of care includes decision-making within 6 hours	Poor: < 60%; Fair: 61% to 79%; Good: 80% to 90%; Excellent: 90% to 100%.
	Percentage of return to emergency within 72 hours for the same cause	What percentage of elderly patients return to emergency within 72 hours for the same cause?	Recommended rate < 6%	Poor: > 15%; Fair: 10% to 14%; Good: 6% to 9%; Excellent: < 5%.

OUTCOME	Percentage of older adults eligible for HCS in observation	What percentage of older adults are eligible for HCS?	10–15% of older adults in observation should be identified as eligible	Poor: < 5%; Fair: 6% to 9%; Good: 10% to 14%; Excellent: > 15%.
	Percentage of medical discharge of elderly patients in UPA 24h	What percentage of elderly patients are medically discharged?	75–90% of older adults receive medical discharge in UPA 24h	Poor: < 60%; Fair: 61% to 74%; Good: 75% to 89%; Excellent: ≥ 90%
	Percentage of elderly patients transferred to hospital units	What percentage of elderly patients are transferred to hospitals?	20% and 30% of elderly people treated at UPA 24h are transferred to hospital units.	Poor: > 40%; Fair: 31% to 40%; Good: 21% to 30%; Excellent: ≤ 20%
	Percentage of stay longer than 24 hours in UPA 24h	What percentage of elderly patients stay more than 24 hours in UPA 24h?	Percentage of stays longer than 24 hours in UPA 24h less than 10%	Poor: > 30%; Fair: 21% to 29%; Good: 10% to 19%; Excellent: ≤ 9%.
	Percentage of deaths among elderly patients in UPA 24h	What percentage of elderly patients die in UPA 24h?	Percentage of deaths of elderly people in UPA 24h less than 3%	Poor: > 15%; Fair: 8% to 14%; Good: 4% to 7%; Excellent: ≤ 3%.
	Percentage of satisfaction among users/older adults	What percentage of users/older adults are satisfied?	Satisfaction percentage ≥ 80% of users/older adults	Poor: < 60%; Fair: 61% to 74%; Good: 75% to 89%; Excellent: ≥ 90%

Source: Prepared by the authors, 2025.

The validation of the matrix demonstrated methodological consistency, evidenced by the AR and CVI scores above the cutoff point of 0.80 in both rounds, confirming the conceptual coherence and stability of the instrument. The diverse qualifications of the expert judges, combined with the quantitative analysis and the careful examination of 145 qualitative comments, allowed for the incorporation of pertinent adjustments without altering the central structure of the matrix. Furthermore, the positive evolution of key items and the predominance of classifications in the “good” and “excellent” categories consolidated the overall evaluation as satisfactory. Thus, the aforementioned version is methodologically adequate for evaluating the quality of care provided for older adults in UPA 24h units.

DISCUSSION

The CV of the matrix showed that the proposed indicators reflect, in a representative way, fundamental dimensions of the quality of care for older adults in UPA 24h. The diversity of backgrounds and experience of the expert panel contributed to a comprehensive analysis of the items, an aspect highlighted by the literature as a pillar in the development of robust and contextualized assessment instruments⁽²⁴⁻²⁵⁾. The predominance of professionals with direct experience in services reinforces the practical adherence of the matrix to the care routines and organizational challenges of the ECN.

The structure of the matrix, organized according to Donabedian’s triad, made it possible to integrate structural elements, care practices, and clinical outcomes related to emergency care for the older population. This framework has been widely used to guide health evaluation processes, particularly in contexts of high organizational complexity, as it facilitates a sequential understanding of service conditions, care processes, and achieved outcomes⁽¹⁰⁾. The good acceptance of the indicators by the experts suggests adherence of this matrix to the evaluative tradition consolidated in the field of healthcare quality.

The adequacy of writing and language emerged as a central aspect in indicator validation, since clarity and objectivity are essential to avoid imprecision and to ensure coherence and relevance of the proposed instrument⁽²⁶⁾. There was also geographical diversity with professionals working abroad (Spain and Canada) and in different Brazilian states (São Paulo and Bahia), which provided greater representativeness and broadened the variety of experiences in the CV⁽²⁴⁾. Therefore, the combination of linguistic clarity and geographical

diversity of the judges strengthened the CV, while incorporating multiple professional and contextual perspectives into the instrument.

The structure indicators encompass key elements for the organization and efficiency of UPA 24h units, such as the availability of physical resources, primary healthcare coverage, and staffing levels. These aspects have been associated with timely access, response time, and care resolvability in emergency contexts^(7,8). Incorporating these elements into the matrix makes it possible to capture structural conditions that directly influence the older adult's experience within the unit and that require coordinated interventions among municipal management, regulation, and primary healthcare. Studies indicate that weaknesses in the integration between primary healthcare and UPA 24h units lead to overcrowding, increased length of stay, and recurrent visits⁽⁷⁻⁹⁾, reinforcing the importance of continuous monitoring of these indicators.

In the Process dimension, the need for strategies to prevent clinical deterioration and return visits to UPA 24h units became evident, such as monitoring protocols, response time, and recurrence of care for the same cause. Studies indicate that the adoption of tailored protocols and the implementation of geriatric training programs are key pillars in improving the quality of emergency care for older adults⁽²⁷⁾. Thus, the sum of these strategies can minimize recurrences, prevent clinical complications, and improve care for older adults.

The Process dimension encompasses elements related to the standardization of care, the use of protocols, and the timeliness of decision-making. The literature highlights that the consistent adoption of clinical protocols and training in geriatric emergency care can reduce complications, improve risk triage, and decrease early return visits to services⁽²⁸⁻²⁹⁾. Thus, although fewer in number, the Process indicators capture aspects that directly influence safety and continuity of care, providing concrete parameters for reviewing care flows and implementing continuing education actions.

The Outcome indicators address clinical and experiential outcomes, such as discharges, transfers, deaths, 72-hour return visits, and older adult satisfaction. Recent studies recommend that quality assessments in geriatric emergency care include indicators that reflect both care outcomes and user perception, as these broaden the understanding of service quality⁽³⁰⁻³¹⁾. The presence of an indicator aimed at identifying eligibility for the Home Care Service highlights the need for integration of the UPA 24h with other points of care, to guarantee continuity of care, reduce avoidable hospitalizations and avoid early readmissions.

The overall evaluation of the instrument was obtained through analysis of the CVI and AR across two rounds. In the first round, the CVI was 0.94, with values of 0.95 for the Structure dimension, 0.96 for Process, and 0.94 for Outcome, indicating consistency in agreement and

in the content validation process. In a similar study, a technology developed in the field of nursing achieved a CVI of 0.94⁽³²⁾, which reinforces the excellence of the indices achieved in this study.

The second round of CV had a reduced number of participants, which highlights the use of the Delphi technique as an ally in illustrating the potential of the panel composition⁽¹⁴⁻¹⁵⁾. In a similar study, there was a progressive reduction in participation between Delphi rounds, with (n=91) experts in the initial stage, (n=69) in the second and (n=56) in the third⁽³³⁾. Despite the reduction in participants, the necessary representativeness was preserved to support the intellectual robustness of the panel, as well as the consolidation of consensus.

Of the sixteen assessed aspects, (n=9) presented an AR of 1.0, six of 0.93 and one of 0.85; that is, all experts considered the indicators valid to compose the instrument. A similar study found that instruments were validated with a AR above 0.90⁽³⁴⁾. In summary, the CV confirmed the adequacy of most indicators, which allows us to highlight the rigor in complying with the methodological recommendations and the consistency of the validated matrix.

The CV of the instrument was achieved in the first round. However, a second round was justified to incorporate the improvements suggested by the judges. In a recent study, the first round showed partial or total agreement above 0.70 for all items, eliminating the need for a second round⁽³⁵⁾. Thus, the initial agreement, associated with the adjustments indicated by the judges, reflects the criticality of the analysis and confirms that AR values above 0.70 indicate methodological consistency of the evaluative matrix.

Regarding qualitative analysis, of the n=145 comments provided by the evaluators, 26% referred to improvements to the instrument within the Process dimension. Synthesizing this information was challenging, as it required discernment and experience from the researchers to select relevant contributions without unnecessarily increasing the size of the instrument⁽¹⁵⁻¹⁶⁾. Given this complexity, theoretically grounded analytical techniques were applied to qualify the information and improve the study.

It is noteworthy that the judges' contributions were instrumental in ensuring the appropriate allocation of indicators across Structure, Process, and Outcome. Their input enabled textual adjustments and the reallocation of the indicator "Percentage of return to emergency within 72 hours for the same cause" to the Process dimension and the indicator "Percentage of stay longer than 24 hours in the UPA 24h" to the Outcome dimension. This reorganization preserved Donabedian's theoretical framework⁽¹⁰⁾ and avoided misinterpretations, as supported by studies that classify outcome indicators as results⁽³⁶⁾.

The predominance of Structure and Outcome indicators in the matrix highlights the centrality of adequate organizational resources and measurable outcomes to qualify care for older adults in UPAs 24h. The literature shows that qualifying care for older adults in geriatric emergencies requires an adapted physical environment, structured care protocols, and the need for ongoing education of the staff⁽³¹⁾. Another study emphasizes that defining indicators with measurement and support from psychometric properties makes it possible to identify critical weaknesses in care, thereby guiding planning and management domains in implementing strategies aligned with the real needs of older adults⁽³⁷⁾.

The practical implications of the findings are significant. The matrix can be incorporated into the routine performance monitoring of UPA 24h units, supporting managers in identifying bottlenecks, planning improvements, and negotiating care-related targets. Its structure facilitates use in supervision processes, audits, continuing education, and comparative evaluation across units. For care teams, it serves as a tool to support reflection on care flows, work organization, and the qualification of care directed toward older adults.

Among the limitations, it is noteworthy that this research only evaluated the content validity of the indicators, without including empirical testing, reliability analyses, or construct validity. Future studies should apply the matrix in different contexts of the ECN, test its sensitivity, and evaluate the stability of the indicators over time.

Despite these limitations, the study contributes by proposing a theoretically anchored evaluative technology, grounded on scientific evidence and validated by experts. Thus, the matrix has the potential to support managers and professionals in defining more precise strategies oriented toward the needs of the older population, strengthening the quality and comprehensiveness of care within the UPA 24h component of the ECN.

CONCLUSION

The study developed an indicator matrix to evaluate the quality of care provided to older adults in UPA 24h units. The instrument presented satisfactory content validity, with statistical scores above the established cutoff point, indicating methodological consistency and theoretical alignment with the Donabedian Triad.

The constructed and validated matrix comprises 16 indicators distributed across the dimensions of Structure (7), Process (3), and Outcome (6), objectively covering installed capacity, care organization, and the effects produced in the care for older adults in UPAs 24h. Structure indicators involved care coverage, availability of professionals, ACCR rooms, and diagnostic resources; the Process indicators reflected the use of standardized protocols,

decision-making within 6 hours, and 72-hour return visits; and the Outcome indicators included eligibility for HCS, discharges, transfers, prolonged stays, deaths, and user satisfaction. The consolidation of these components strengthens the matrix's applicability by offering objective parameters for the continuous monitoring of care for older adults.

The matrix comprehensively integrated the dimensions of Structure, Process, and Outcome, enabling the identification of critical aspects of care and, consequently, guide interventions aimed at improving care quality. The developed instrument also represents an advance in quality management in urgent and emergency services, particularly within the UPA 24h component, by providing measurable parameters to support analysis and decision-making.

Finally, the application of the matrix in different ECN contexts and at other levels of care is recommended in order to test its applicability and expand the external validity of the findings. Future studies may explore indicator performance in time series and integrate this evaluative technology into health information systems, strengthening the monitoring of care quality.

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Data and material availability

Access to the dataset is available upon request from the corresponding author.

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Received: 07.28.2025

Approved: 12.10.2025

Associate editor:

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Editor-in-chief:

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