Journal of Nursing
Revista de Enfermagem
UFPE On Line
ISSN: 1981-8963

ORIGINAL ARTICLE

DIFFERENTIAL VALIDATION OF NURSING DIAGNOSES OF IMPAIRED MEMORY AND CHRONIC CONFUSION

VALIDAÇÃO DIFERENCIAL DOS DIAGNÓSTICOS DE ENFERMAGEM MEMÓRIA PREJUDICADA E CONFUSÃO CRÔNICA

VALIDACIÓN DIFERENCIAL DE LOS DIAGNÓSTICOS DE ENFERMERÍA DE MEMORIA PERJUDICADA Y CONFUSIÓN CRÓNICA

Priscilla Alfradique de Souza[1], Rosimere Ferreira Santana[2], Keila Mara Cassiano[3]

ABSTRACT

Objective: to validate differentially nursing diagnoses of impaired memory and chronic confusion proposed by NANDA-I. ***Method:*** quantitative, descriptive study based on the differential diagnostic validation model. We used a convenience sample composed of 31 expert nurses who answered the Likert-type scale of 165 items. The analysis of the data was performed using the overall average score, and subsequently compared using Wilcoxon's test. The research was approved by the Ethics Research Committee, CAAE: 0163.0.258.000-09. ***Results:*** regarding impaired memory, three major defining characteristics were identified, and with respect to chronic confusion, seven had scores between .79 and .63. The paired Student's *t*-test revealed similarities between the two diagnoses (p = 0.135). ***Conclusion:*** a total of 18 out of the 20 defining characteristics and eight out of the 11 related factors were considered proper for at least one diagnosis, even not belonging to the original diagnosis, which denotes similarities and the need of differentiation for good use in clinical practice. ***Descriptores:*** Nursing Diagnosis; Validation Studies; Nursing Processes; Memory.

RESUMO

Objetivo: validar diferencialmente os diagnósticos de enfermagem memória prejudicada e confusão crônica propostos pela NANDA-I. ***Método*:** estudo quantitativo, descritivo, baseado no modelo de validação diferencial diagnóstica. Foi utilizada amostra por conveniência, composta por 31 enfermeiros peritos que responderam o formulário do tipo Likert de 165 quesitos. A análise dos dados foi realizada pela média do escore global e posteriormente comparados pelo teste de Wilcoxon. A pesquisa teve aprovação do Comitê de Ética em Pesquisa, CAAE: 0163.0.258.000-09. ***Resultados*:** para memória prejudicada, identificaram-se três características definidoras maiores e para confusão crônica sete tiveram pontuações entre 0,79 e 0,63. A análise do teste *t*-tudent pareado revelou semelhanças entre os dois diagnósticos (p = 0,135). ***Conclusão:*** um total de 18 das 20 características definidoras e oito dos 11 fatores relacionados foram considerados adequados a pelo menos um diagnóstico, mesmo não pertencendo ao diagnóstico original, o que denota similaridades e necessidade de diferenciação para o bom uso na prática clínica. ***Descritores:*** Diagnóstico de Enfermagem; Estudos de Validação; Processos de Enfermagem; Memória.

RESUMEN

Objetivo: validar diferencialmente los diagnósticos de enfermería memoria perjudicada y confusión crónica propuestos por NANDA-I. ***Método:*** estudio descriptivo y cuantitativo basado en el modelo de validación diferencial de diagnósticos. Fue utilizada una muestra por conveniencia compuesta por 31 enfermeros expertos que respondieron el formulario con una escala tipo Likert de 165 ítems. El análisis de los datos fue realizado por el promedio de la puntuación total y posteriormente comparados con la prueba de Wilcoxon. La investigación fue aprobada por el Comité de Ética en Investigación, CAAE: 0163.0.258.000-09. ***Resultados:*** para la memoria deteriorada se identificaron tres características definitorias principales y para la confusión crónica siete tuvieron puntuaciones entre 0,79 y 0,63. La prueba *t* de Student pareada reveló similitudes entre los dos diagnósticos (p = 0,135). ***Conclusión:*** un total de 18 de las 20 características definitorias y ocho de los 11 factores relacionados se consideraron adecuados a por lo menos un diagnóstico, incluso no perteneciendo al diagnóstico original, lo que denota similitudes y la necesidad de diferenciación para el buen uso en la práctica clínica. ***Descriptores:*** Diagnóstico de Enfermería; Estudios de Validación; Procesos de Enfermería; Memoria.

[1]Nurse, Master's degree holder, Doctoral candidate, University of Texas Health Science Center at San Antonio(UTHSCSA). San Antonio, TX, United States. E-mail: priscillalfradique@gmail.com; [2]Nurse, PhD. in Nursing, Associate professor, Medical-Surgical Nursing Department, Aurora de Afonso Costa Nursing School (EEAAC), Fluminense Federal University (UFF). Niterói, RJ, Brazil. E-mail: rosifesa@enf.uff.br; [3]Mathematician, PhD. in Electrical Engineering, Associate professor, Statistics Department, Fluminense Federal University (UFF). Niterói, RJ, Brazil. E-mail: keilamath@hotmail.com

INTRODUCTION

Nursing diagnosis is characterized as an essential step for implementing the nursing process.[1] The effective implementation of the nursing process in clinical practice requires obtaining accurate and clear diagnoses to help nurses in their correct identification.[2]

In this way, NANDA-I designed their classification in a multiaxial way, called Taxonomy II, which follows the terminology model of the International Standards Organization. According to this terminology, the diagnoses "impaired memory" (00.131) and "chronic confusion" (00.129) are included in the domain 5, perception/cognition, defined as "human information processing system, which includes attention, orientation, sensation, perception, cognition, and communication".[3:249] The two diagnoses are included in class 4, i.e., cognition, which corresponds to the "use of memory, learning, reasoning, problem solving, abstraction, judgment, insight, intellectual capacity, calculations, and language".[3:249]

In the same classification, the concept of diagnosis of impaired memory is defined as "the inability to remember or recall pieces of information or behavioral skills".[3:259] The concept for chronic confusion is "irreversible, prolonged and/or progressive decay of the intellect and personality, characterized by diminished capacity for interpretation of environmental stimuli and intellectual thinking processes, and manifested by memory, orientation and behavior disorders".[3:254] Therefore, it is possible to observe similarities between the two diagnoses according to their descriptions.

Such similarities are enhanced when the defining characteristics and related factors of the two diagnoses are compared. It is observed that the defining characteristics of impaired memory include essential elements also applied to define the presence or absence of the defining characteristics of chronic confusion, for example, impaired short-and long-term memory. Similarly, among the related factors, neurological disorders, belonging to the diagnosis of impaired memory, are defined in such a generalized way that it can also be attributed to chronic confusion. This way, the issue under study arises, because such intersections may interfere with determining the diagnosis accurately, the development of a care plan for nursing care, and, consequently, in the quality of life of individuals experiencing these diagnoses. Therefore, these issues demonstrate the need of differentiation between the diagnoses of impaired memory and chronic confusion.

We developed the following hypotheses: a) affirmative (H-1): there is a difference between the defining characteristics and the related factors of the diagnoses of impaired memory and chronic confusion; and b) null hypothesis (H-0): there is no such difference. This way, we determined the goal of the present study, namely: to validate differentially the contents of the nursing diagnoses of impaired memory and chronic confusion.

METHOD

This is a descriptive study with a quantitative approach conducted by experts to validate differentially the nursing diagnoses of impaired memory and chronic confusion, based on the differential diagnostic validation model.[4] The goal of this model is to validate the differences between two diagnoses that feature correlations, or differentiate the levels assigned to each one of them.[5] At a later stage of the study, we carried out an integrative review of the literature with 30 articles in order to determine the concepts.

The following criteria were used to select the experts: holding at least a master's degree in nursing; having attended a course or specialization program in the area of the nursing diagnosis assessed in the study; having published articles and presented scientific works that addressed the topic; having performed a minimum of five-year clinical practice in the area; and having used nursing diagnosis for five years.[4,6-9]

The search strategy initially included the research groups, with analysis of the "Curriculum Lattes"[1], and contacts from email addresses of the researchers in the Lattes Platform. We sent information explaining the goals of the study and an informed consent form via e-mail. Once the

[1] Resume drawn up according to the Lattes Platform created by the Coordination for the Improvement of Higher Education Personnel (CNPq), a government agency linked to the Brazilian Ministry of Education in charge of promoting high standards for post-graduate courses in Brazil.

candidates accepted to participate, we submitted the form for data collection and, finally, based on the snowball technique, we requested the indication of other experts.[4,7-10]

With respect to the sample, we chose a 10% acceptable sample error, with specialists proportion of 90%,[11] which would require a minimum of 35 experts. However, since it is a specific diagnostic category with few nurses who confirm the use of the mentioned diagnoses in the clinical practice, we selected a convenience sample of 31 experts, which is an acceptable margin for the sample originally intended.

As data collection instrument we used a form composed of two parts: (a) identification data; and (b) instrument for differential validation, composed of a Likert-type scale for assessment of the following items: suitability; relevance; clarity; accuracy; and objectivity, for the two diagnoses, i.e., two definitions, 20 defining characteristics, and 11 related factors. The items were organized without identifying the diagnosis to which they belonged according to NANDA-I. In other words, the experts assessed blindly the instrument items and, finally, they determined whether they related to the contents of the diagnosis of impaired memory or chronic confusion.

The calculation of the overall average score was performed from the total sum and division of the five assessments relating to each definition, five for each defining characteristic, and five for each related factor of the two diagnoses, thus performing a total of 165 assessments in the form. This procedure made the classification possible according to the following score: characteristics with an average greater than or equal to 0.80 were considered major characteristics; those with average between 0.60 and 0.79 were defined as minor characteristics; and those whose average score was lower than or equal to 0.59 were not relevant regarding the diagnoses and were discarded.[4,10]

In the final step, in order to calculate the score of the differential diagnostic validation in each diagnosis, relevant scores (above .59) were added together and divided by the number of validated items. Subsequently, these scores were compared using Wilcoxon's test and, when the normality of the distribution of the scores averages was determined using Kolmogorov-Smirnov's test, the comparison was performed using the paired Student's *t*-test.[11] The data were processed using the Statistical Package for the Social Science (SPSS) version 13.0 for Windows.

The research was approved of the Research Ethics Committee of the Medical Sciences Center at Fluminense Federal University (Opinion CAAE No. 0163.0.258.000-09), in accordance with Resolution 466/2012 of the National Health Council of the Ministry of Health.

RESULTS

♦ Characterization of the participants of the study

Of the 31 expert nurses, 21 (67.74%) had experience in their practice with nursing diagnosis of impaired memory, 15 (45.03%) with chronic confusion, and six (19.35%) with impaired memory and chronic confusion. There was a predominance of doctors (16 = 51.61%). According to the recommended score,[5,7] these doctors obtained between six and 12 points, averaging 8.8 points, thus showing that, in addition to the doctoral degree, all of them had additional experiences, ensuring that their suggestions were considered eligible for the study.

♦ Average scores for impaired memory and chronic confusion

The overall average scores for the diagnosis of impaired memory are presented in Table 1. It also presents the overall average score of the diagnosis of chronic confusion assessed differentially.

Regarding the results for the definitions, impaired memory obtained an overall average score of .80. With respect to chronic confusion, its definition obtained overall average score of .27. Inappropriate defining characteristics were not observed.

Table 1. Scores of the defining characteristics of impaired memory assessed for nursing diagnoses of impaired memory and chronic confusion. Rio de Janeiro, 2012.

Items assessed	Score* for IM	Score* for CC
Major defining characteristics		
Inability to determine whether an action was performed	.86	.73
Inability to recall events	.86	.67
Forgetting to perform an action in a planned time	.83	.66
Minor defining characteristics		
Inability to recall factual information	.77	.63
Oblivion experiences	.75	.68
Inability to retain new information	.74	.71
Inability to perform a skill previously learned	.71	.62
Inability to retain new skills	.69	.71
Inability to learn new information	.66	.67
Inability to learn new skills	.66	.55

Note: Score* = overall average score; IM = impaired memory; CC = chronic confusion.

Table 2 presents the overall average score of factors related to impaired memory, followed by the overall average score of the diagnosis of chronic confusion assessed differentially. According to the results, there were no major related factors.

Table 2. Scores of factors related to impaired memory assessed for nursing diagnoses of impaired memory and chronic confusion. Rio de Janeiro, 2012.

Items assessed	Score* for IM	Score* for CC
Minor related factors		
Neurological disorders	.78	.83
Hypoxia	.70	.74
Hydration and electrolyte imbalance	.66	.54
Inappropriate related factors		
Anemia	.59	.48
Decreased cardiac output	.58	.56
Excessive environmental changes	.54	.50

Note: Score* = overall average score; IM = impaired memory; CC = chronic confusion.

The results for the definition of chronic confusion had an overall average score of .77. When the definition of the diagnosis of chronic confusion was assessed, it obtained an overall average score of .30. Table 3 shows the overall average score for the defining characteristics of nursing diagnosis of chronic confusion. It also shows the overall average score of the diagnosis of impaired memory assessed differentially. Major defining characteristics for chronic confusion were not observed.

Table 3. Scores of the defining characteristics of chronic confusion assessed for nursing diagnoses of chronic confusion and impaired memory. Rio de Janeiro, 2012.

Items assessed	Score* for CC	Score* for IM
Minor defining characteristics		
Progressive cognitive impairment	.79	.53
Long-standing cognitive impairment	.78	.46
Impaired socialization	.77	.52
Changed interpretation	.75	.50
Changed response to stimuli	.70	.33
Impaired long-term memory	.68	.68
Impaired short-term memory	.67	.83
Personality change	.63	.24
Inappropriate defining characteristics		
Clinical evidence of organic impairment	.57	.47
No consciousness change	.46	.54

Note: Score* = overall average score; IM = impaired memory; CC = chronic confusion.

Table 4 shows the overall average score for related factors of nursing diagnosis of chronic confusion and the overall average score of impaired memory assessed differentially. Inappropriate related factors for chronic confusion were not observed. It is worth noting that the determination of the defining characteristics and related factors (major, minor, and inappropriate) was performed based on the results of the original nursing diagnosis.

Table 4. Scores of related factors of chronic confusion assessed for the nursing diagnoses of chronic confusion and impaired memory. Rio de Janeiro, 2012.

Item assessed	Score* for CC	Score* for IM
Major related factors		
Multi-infarct dementia	.83	.81
Cerebral vascular accident	.81	.76
Alzheimer's disease	.81	.84
Minor related factors		
Korsakoff's psychosis	.73	.71
Craniocerebral trauma	.70	.71

Note: Score* = overall average score; IM = impaired memory; CC = chronic confusion.

The overall assessment of differential diagnostic validation revealed that 18 of the 20 defining characteristics and eight of the 10 related factors were considered appropriate for at least one of the diagnoses, even though they did not belong to the original diagnosis. The scores of the differential diagnostic validation were .747 for impaired memory and .744 for chronic confusion. Such proximity of the values shows that the results were very similar.

With respect to the defining characteristics, only four of the 20 assessed were classified as major (inability to determine whether an action was carried out, inability to recall events, forgetting to perform an action in a planned time, and impaired short-term memory). The scores of other 14 characteristics were compatible with minor characteristics and two were classified as inappropriate for both diagnoses. There were no changes in the level of consciousness or clinical evidence of organic impairment.

Regarding the 11 related factors, four were identified as major—one being for chronic confusion (neurological disorders), which is originally included in impaired memory—another solely for chronic confusion (cerebral vascular accident), and two were classified as major factors for the two diagnoses (Alzheimer's disease and multi-infarct dementia). As for the others, six had scores that classified them as minor for at least one of the diagnosis, and three were classified as inappropriate for the two diagnoses. It is worth noting that only one related factor was exclusively validated as appropriate for the diagnosis of impaired memory (hydration and electrolyte imbalance).

♦ **General assessment of the averages of the assessments**

The assessment parameters of the validation index of the diagnostic items (VIDI) are shown in Table 5. The first column shows the overall VIDI and the second column shows the exclusion of items that had a higher degree of disagreement among the experts.

Table 5. Assessment of the hypothesis testing according to the VIDI for the instrument proposed, and post-discard VIDE for the confounding items according to criteria of the Fehring model. Rio de Janeiro, 2012.

Variables	VIDI for the instrument proposed		Post-discard VIDI for the confounding items	
	Impaired memory	Chronic confusion	Impaired memory	Chronic confusion
Mean	.77	.73	.66	.69
Mode	.49	.37	.43	.76
Standard deviation	.13	.15	.11	.12
Variation coefficient	.17	.20	.17	.17
Minimum	.49	.37	.43	.42
Maximum	1.00	1.00	.90	.90
25 percentile	.67	.62	.58	.60
50 percentile	.77	.74	.68	.69
75 percentile	.89	.83	.73	.80
p-value*	.755	.971	.805	.998
Paired Student's *t*-test	.135		.058	

Note: VIDI = validation index of the diagnostic items; *p*-value* = Kolmogorov-Smirnov test.

The analysis performed with the paired Student's *t*-test revealed similarities between the two nursing diagnoses (p = .135). After excluding the confounding items, it was possible to observe a downward trend in significance (p = .058), indicating a possible differentiation between the two diagnoses.

DISCUSSÃO

The main goals of the differential diagnostic validation are assessing the differences between two closely related diagnoses and identify to what extent their defining characteristics and related factors are indicative of one or another diagnosis.[4,9,12-3] This procedure contributes to the refinement of the classification that has grown in the number of diagnoses which, however, are assessed separately.

For the reliability of the results, it becomes paramount to consider the experience of experts in the field of the diagnoses assessed, particularly the clinical practice, as addressed in the present study. However, it can also be considered a methodological limitation in this type of study, given the short number of experts in the field.[8,10,14]

One of the requirements for the diagnostic validation process is definitions with clear and accurate descriptions, aiming at helping in distinguishing similar diagnoses. Therefore, according to the assessments of the experts, only the definitions of the diagnoses assessed in the present study met these requirements.[3]

Regarding the defining characteristics, we observed that the two diagnoses were related to the processes of using memory, both for acquiring and evoking information.[15-6] Since such processes do not occur in isolation, they require other cognitive areas, such as language, visual and proprioceptive recognition, support for background information sharing, storage, and judgment. In this way, the concept of memory itself is expanded toward an approach to the term cognition.[16-8]

Therefore, the related factors for impaired memory—such as decreased cardiac output, excessive environmental disturbances, and hypoxia—are cited in the literature as a cause of worsening memory loss.[18-20] This fact can be related to the development of impaired memory or to its correlation with worsening chronic diseases,[19-23] what can explain the similarities found between them.

The related factor neurological disorder was considered appropriate, because it serves as a reference for irreversible chronic conditions.[5,24] However, this related factor features a broad definition, which covers different pathological causes of the two diagnoses, that may be reversible, irreversible and/or interfere with short- and/or long-term memory.[19-20,24-5]

Another controversial issue is the prevalence of the diagnoses assessed in the older adult population.[26] Examples are the related factor anemia, which is a possible causative factor of cognitive impairment in older adults, and hydration and electrolyte imbalance, which can also promote disorders in the amount of volume and composition. Studies have demonstrated that the two disorders are related to the development of cognitive impairment in older adults.[19-23]

CONCLUSION

The main relevance of the present study is the confirmation of similarity between the nursing diagnoses of impaired memory and chronic confusion. Such similarity can interfere with the diagnostic accuracy of nurses in the use of the taxonomy in clinical practice and, consequently, it can hinder nursing care provided to patients.

One limitation is that such research requires clarification of the concepts for determining the essential attributes of each diagnosis, with subsequent conceptual and clinical validation in different scenarios. In addition, such nursing diagnoses are included in an area that permeates subjective and behavioral issues, with few studies on the subject, which raises essential pursuit of expansion of the definitions discussed in the present study.

REFERENCES

1. Lunney M. Use of critical thinking in the diagnostic process. Int J Nurs Terminol Classif. 2010; 21(2):82-8.

2. Conselho Federal de Enfermagem. Resolução No 358 de 23 de outubro de 2009: Sistematização da Assistência de Enfermagem. Rio de Janeiro: COFEN; 2009.

3. Herdman TH, Kamitsuru S, editors. NANDA International nursing diagnoses: Definitions & classification, 2015-2017. Oxford: Wiley Blackwell; 2014.

4. Fehring RJ. Methods to validate nursing diagnoses. Heart Lung. 1987; 16(6):625-9.

5. Ried S, Gutzmann H. The nursing phenomenon “Chronic confusion” in relation to the diagnosis “Dementia”. Z Gerontol Geriatr. 2003; 36(4):297-302.

6. Santos ASR, Souza PA, Valle AMD, Cavalcanti ACD, SA SPC, Santana RF. Caracterização dos diagnósticos de enfermagem identificados em prontuários de idosos: um estudo retrospectivo. Texto & contexto enferm. 2008; 17(1):141-9.

7. Lopes MVO, Araújo TL, Silva VM. Methods for establishing the accuracy of clinical indicators in predicting nursing diagnoses. Int J Nurs Knowl. 2012; 23(3):74-9.

8. Galdeano LE, Rossi LA, Pelegrino FM. Validação de conteúdo do diagnóstico de enfermagem conhecimento deficiente. Acta paul enferm. 2008; 21(4):549-55.

9. Garcia TR. Modelos metodológicos para validação de diagnósticos de enfermagem. Acta paul enferm. 1998; 11(3):24-31.

10. Fehring RJ. Validation diagnostic labels: standardized methodology. In: Hurley ME, editor. Classification of nursing diagnosis: proceeding of the sixth conference. St. Louis: Mosby; 1986. p.183-90.

11. Sosa-Ortiz AL, Acosta-Castillo I, Prince MJ. Epidemiology of Dementias and Alzheimer’s Disease. Arch Med Res. 2012; 43(8):600-8.

12. Whitley GG. Expert validation and differentiation of the nursing diagnoses anxiety and fear. Nurs Diagn. 1994; 5(4):143-50.

13. Simon JM, Baumann MA, Nolan L. Differential diagnostic validation: acute and chronic pain. Nurs Diagn. 1995; 6(2):73-9

14. Chaves ECL, Carvalho EC, Hass VJ. Validação do diagnóstico de enfermagem Angústia Espiritual: análise por especialistas. Acta paul enferm. 2010; 23(2): 264-70.

15. Howieson DB, Carlson NE, Moore M, Wasserman D, Abendroth CD, Payne-Murphy J, et al. Trajectory of mild cognitive impairment onset. J Int Neuropsychol Soc. 2008; 14(2):192-8

16. Jefferies E, Hoffman P, Jones R, Ralph MAL. The impact of semantic impairment on verbal short-term memory in stroke aphasia and semantic dementia: a comparative study. J Mem Lang. 2008; 58(1):66-87.

17. Geda YE, Mild cognitive impairment in older adults. Curr Psychiatry Rep. 2012; 14(4):320-7.

18. Santos AT, Leyendecker DD, Costa ALS, Souza-Talarico JN. Queixa subjetiva de comprometimento da memória em idosos saudáveis: influência de sintomas depressivos, percepção de estresse e autoestima. Rev Esc Enferm USP on line [Internet]. 2012 [Cited 2013 May 3]; 46:24-9. Available from: http://www.scielo.br/pdf/reeusp/v46nspe/en_04.pdf

19. Petersen RC. Clinical practice. Mild cognitive impairment. N Engl J Med. 2011; 364(23):2227-34.

20. Downing LJ. Geriatric psychiatric review: differential diagnosis and treatment of the 3 D’s – delirium, dementia, and depression. Curr Psychiatric Rep. 2013; 15(6):365-74.

21. Roden M, Simmons BB. Delirium superimposed on dementia and mild cognitive impairment. Postgrad Med. 2014; 126(6):129-37.

22. Chertkow H, Massoud F, Nasreddine Z, Belleville S, Joanette Y, Bocti C, et al. Diagnosis and treatment of dementia: mild cognitive impairment and cognitive impairment without dementia. CMAJ. 2008; 178(19):1273-85.

23. Gratão A, Fonseca G, Parreira C, Faustino A, Cruz K. Proposta de protocolo de assistência de enfermagem ao idoso demenciado. J Nurs UFPE on line [Internet]. 2014 [cited 2015 Jan 5];8(4);879-88. Available from: http://www.revista.ufpe.br/revistaenfermagem/index.php/revista/article/viewPDFInterstitial/4079/pdf_4866

24. Ried S, Dassen T. Chronic confusion, dementia, and impaired environmental interpretation syndrome: a concept comparison. Nurs Diagn. 2000; 11(2):49-59.

25. Pittenger C. Disorders of memory and plasticity in psychiatric disease. Dialogues Clin Neurosci. 2013; 15(4):455-63.

26. Souza PA, Santana RF. Diagnóstico de enfermagem memória prejudicada em idosos hospitalizados. Acta paul enferm. 2011; 24(1):36-42.

Submission: 2015/03/16
Accepted: 2015/07/25
Publishing: 2015/08/15

Corresponding Address

Priscilla Alfradique de Souza
Rua Araguaia, 149, 1/102
Bairro Freguesia de JPA
CEP 22745-270 – Rio de Janeiro (RJ), Brazil