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Original Article

Association between Native Language and Adherence to the Treatment of Chronic Diseases: Arterial Hypertension and Diabetes Mellitus in the Older Adult in Peru

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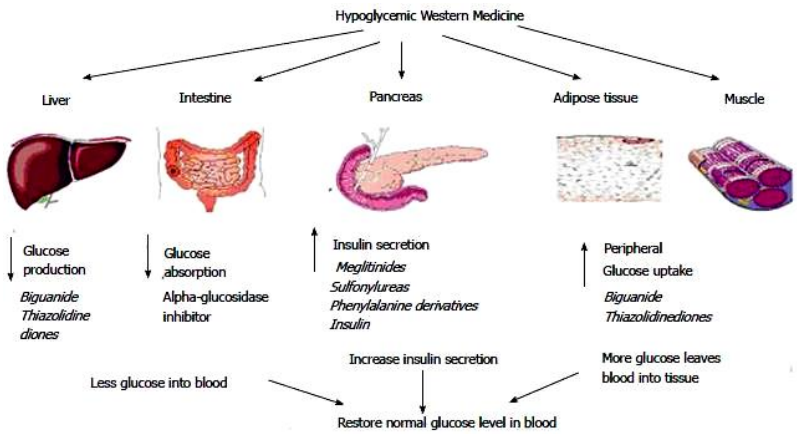
ABSTRACT

Objectives: To establish whether there is an association between adherence to treatment and the patient's language.
Design: The article presents an analytical cross-sectional design.
Data Sources: The study used the 2019 Demographic and Family Health Survey (ENDES) in 33,760 homes throughout Peru, carried out by the National Institute of Statistics and Informatics (INEI). Due to the nature of our population, a sample size calculation was performed using the frequency of the expected outcome.
Review Methods: A bibliography search was carried out in PUBMED, GoogleSchoolar, and Redalyc.
Results: In the regression analysis, we observed that in the crude model the risk of having non-adherence to treatment in people with a native mother tongue was 1.607, the risk of older adults with a mother tongue Spanish. Regarding the model adjusted by the epidemiological model, the prevalence of risk was 1.60; this association was shown to be statistically significant.
Conclusion: If the patient presents a language different from that of the treating physician, it is more likely that the treatment will be missed.

GRAPHICAL ABSTRACT



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Introduction

At present, there is a marked increase in the population of the Third Age or Older Adult, both in developed and developing countries; trend resulting from the evolution of the components of demographic change, the decrease in mortality, birth rate and its resulting increase in life expectancy at birth makes old age become a stage of life that requires attention from International Organizations, the State and civil society to safeguard their physical, emotional and spiritual integrity in the social, economic, political and cultural sphere of a nation.

In the context of Latin America, Peru appears with a Greater Adult population growth of 8.76% as of 2010. According to the INEI, Peru for the year 2021, the Bicentennial of National Independence, the population will be 33 million 149 thousand inhabitants with an average annual growth of 325 thousand inhabitants. In 2050, the population will be 40 million 111 thousand [3]. To understand aging and its needs, we must consider biological deterioration, with a decrease in physical and mental capacities and also an increased risk of more diseases (World Health Organization, 2018). Likewise, there are classifications for the elderly such as the young elderly (55-64 years), the mature elderly (65-74 years), the elderly (75-84 years), and the elderly (over 85 years) [12]. However, the World Health Organization (WHO) considers any person aged 60 years or over as Elderly.

Another issue raised by the WHO is the multiple conditions that are added to this population as chronic diseases such as high blood pressure, diabetes mellitus and/or dementia. Likewise, there are multiple factors associated with successful and healthy aging, such as sex, ethnicity, safe environment, healthy habits, personal characteristics. Therefore, the Pan American Health Organization (PAHO) proposes four areas of action: Fight against age discrimination, friendly environments, alignment of health systems and long-term care [22].

In our country, the prevalence of diseases in Older Adults (PAM) is manifested in 74.4%, who have some health problem where 46.2% declared to present symptoms and 41.9% indicated that they had some disease. Chronic diseases such as arthritis, hypertension, asthma, rheumatism, diabetes, etc. have increased significantly in this population group with emphasis on the MAP of the female sex. These indicators suggest individual responsibility, but mainly due to the lack of equitable access that the population has for a healthy life and having support in making healthy decisions [3].

In other words, the health system must reinforce its strategies to provide correct care for this age group. Focusing on the joint intervention of the health personnel and the environment that accompanies them, since one of the main influencing factors in the self-care of the elderly is treatment adherence. This is related to the participation perceived by the person, having 2.42 times more risk of having a poor adherence to treatment those people who do not feel that participation [5].

According to the descriptors in Health Sciences (DeCS), Adherence to Treatment is the degree to which the patient follows the prescribed treatment, such as the maintenance of appointments, schedules, and compliance with the medication for the desired therapeutic result, implying an active responsibility shared by the patient and the care providers of health; therefore, non-adherence to treatment constitutes a constant problem when treating any clinical pathology; however, it is increased when dealing with chronic diseases and in the elderly population [1]. Currently, more than 200 factors associated with treatment non-adherence have been established [1]. A 2019 systemic review of studies in the US, Canada, and Europe exposes several significantly associated factors; alcohol consumption (OR: 2), divorced (OR: 1.28), lack of understanding of the patient's needs (OR: 1.97), lack of perceived participation (OR: 2.42) and not speaking English (OR: 1.40) [5].

A transversal determinant, included in the framework of active aging, is Culture; it involves people and populations, determining the way we age. Cultural values and traditions largely determine how society views older people and the aging process. For example, different ethnic identities bring a diversity of values, attitudes, and traditions to the dominant culture within a

country. The policies and programs that are implemented need to respect cultures and traditions, eliminating stereotypes and preconceptions [21].

Interculturality is the equitable presence and interaction of diverse cultures and the possibility of generating shared cultural expressions, through dialogue and mutual respect, in accordance with Article 4.8: Convention on the Protection and Promotion of the Diversity of Cultural Expressions. A country with cultural diversity harbors groups, peoples and plural expressions, with different traditions or cultural matrices, under the same political system. In Peru, indigenous cultures are not minorities. On the contrary, during a good part of our republican history they have formed the majority of our population and even today Quechua is a current language. These cultural and linguistic majorities have been undervalued due to the organization of our society, reproducing hierarchical, discriminatory and exclusive forms of relationship. Being a Quechua majority meant being a minority in terms of social prestige. In the Afro-Peruvian case, 2% of the total population according to ENAHO 2010 means being invisible to the eyes of the rest of the social body and public officials.

The Vice Ministry of Interculturality published the list of 52 indigenous or native peoples in 2013: 48 from the Amazon and 4 from the Andean region (Quechua, Aymara, Jaqaru, and Uros). According to figures worked by INDEPA 3 919 314, people aged 5 and over speak indigenous languages; 3,261,750 are Quechua speakers, 434,370 Aymara speakers and 223,194 speak another native language. According to ECLAC (2007), Peru is the third country with an indigenous population in Latin America [7[. There are more than 3 million 360 thousand 331 speakers according to data from the INEI (2007), a figure that has increased since 1993 and which shows that even though it has had more than 500 years of contact with other languages of the world, Quechua is the indigenous language, resisting the colonization process in Latin America [11].

Thus, culture is preserved through language; Spanish is the second most widely spoken language in the world because it is the official language of many Latin American countries. However, Spanish coexists with other native languages found throughout America. According to data from the United Nations Children's Fund (UNICEF), indigenous peoples in Latin America speak 420 different languages 103 of them are cross-border, that is, they are spoken in two or more countries. This data should be considered taking into account that 108 indigenous peoples are also cross-border; therefore, it is necessary to think beyond national borders. Linguistically, the indigenous languages of America are important, not by quantity, since for example in Africa they are spoken around 2000, but by the number of linguistic families, the largest in the world is in America with about 99 families.

The original or native languages such as Quechua have between 9 and 14 million speakers and it is the most widely spoken indigenous language in Latin America. It spans the Andes, from Bolivia, Peru, and Ecuador to northern Chile, Argentina, and southern Colombia. Quechua in Peru is the only co-official indigenous language in Latin America along with Guaraní in Paraguay [21]. Peru is one of the countries with the greatest cultural and linguistic diversity in the region with 55 indigenous peoples and 47 native languages that are spoken by more than 4 million people on the coast, mountains and jungle. There are currently 47 languages registered on the ethnolinguistic map, the most widely spoken being Quechua, Aymara and Asháninca (Ministry of Education, 2018a). Quechua was the official language of the Inca empire and its etymology resides in / qheswa / which means "the talk about the valley". There are numerous dialects of Quechua and it has been official since 1975, and 40% of the population speaks some of its varieties; however, there have not been many policies promoting its use (Law No. 29735).

The association between the language barrier and treatment adherence has been described in the literature. However, this information is based on limited English proficiency [16, 22] and not on the difference between people who speak Spanish and a native language (Quechua, Aymara, Asháninca) of his country. This

association is based on the fact that healthcare providers spend less time listening to the patient and giving fewer words of support to the patient and family members [16]. Therefore, the present work hypothesizes that older adults who have a native mother tongue have a greater probability of not having adherence to the treatment of chronic diseases.

Material and methods

Design

The target population was the elderly, which corresponds to people aged 60 or over. The total number of respondents was 33,760 dwellings. The data were obtained directly through the demographic and family health survey. A cross-sectional analytical study was carried out since our objective was to evaluate the existence of an association between older adults with a native language and adherence to the treatment of chronic diseases.

Population

The study used 2019 Demographic and Family Health Survey (ENDES) in 33,760 homes throughout Peru, conducted by the National Institute of Statistics and Informatics (INEI). Due to the nature of our population, a sample size calculation was performed using the frequency of the expected outcome.

Selection criteria

All older adults (60 years and over) were included in the study. On the other hand, people who did not have a diagnosis of a chronic disease, arterial hypertension (HT) and/or Diabetes Mellitus (DM) were excluded, in addition to those who had a diagnosis but were not taking any type of treatment, see flow chart (Figure. 1).

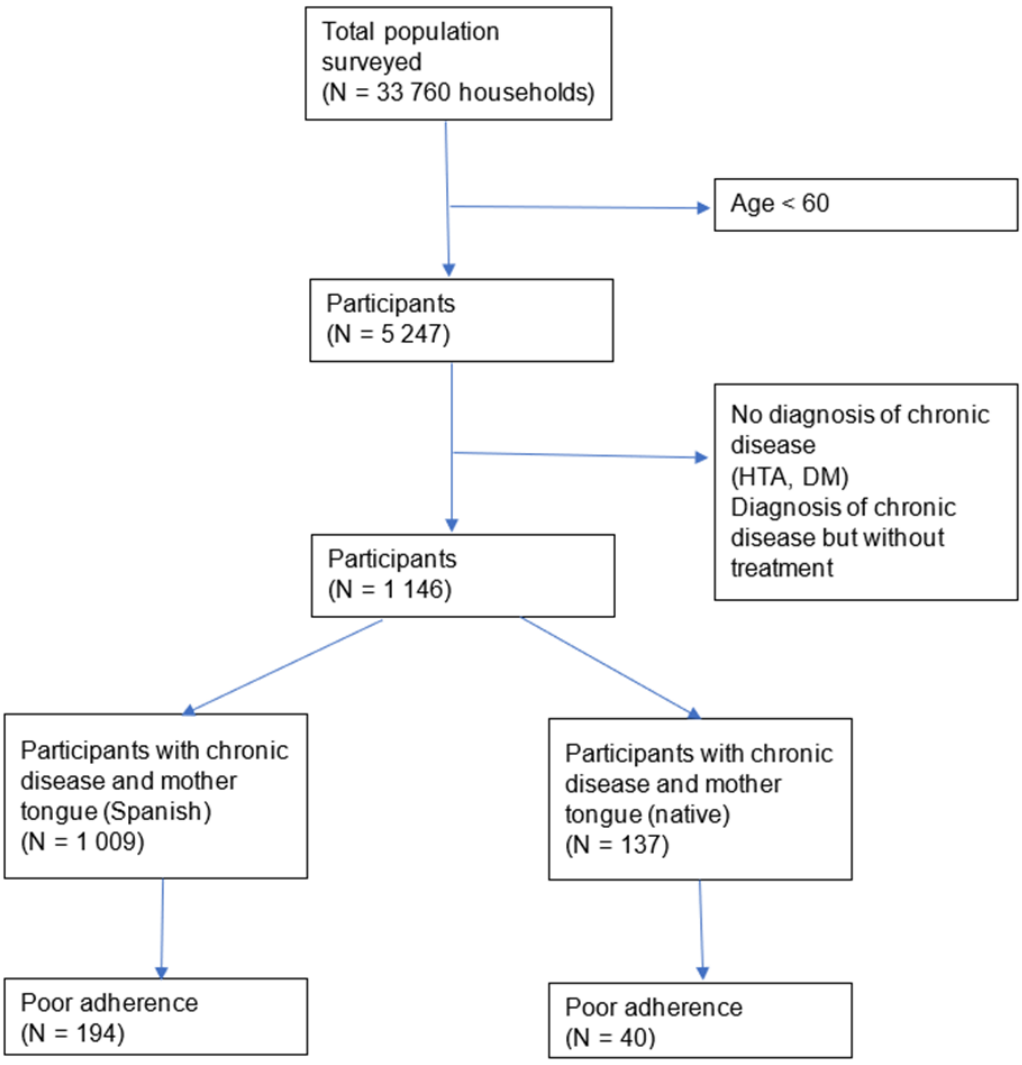

Figure 1: Flow char

Sample size calculation

The sample size calculation was estimated based on the frequency of the expected outcome. For this, the database compiled by the INEI in 2019 was used. Within a systematic review, it was found that one of the factors was low adherence to treatment, the lack of participation perceived by the patient, obtaining an OR of 2.42 [3]. The sample size was calculated with Openepi version 3® and it turned out to be 594 older adults.

Variables and measurements

Response variable: Adherence to treatment. It was obtained through the survey. To evaluate this variable, the persons who claimed to have a chronic disease (HT and/or DM) and also confirmed the use of the drug as indicated by their doctor, were covered. The questions applied were: Were you diagnosed with hypertension or high blood pressure? Were you diagnosed with diabetes or high blood sugar? (YES) Did you take medications as the doctor indicated? (YES).

Exposure variable: Native mother tongue. It was obtained through the survey. Within the questionnaire, the respondent was asked what their mother tongue was, they were given 12 possible options. However, for our study, they were re-categorized into Spanish and native languages (Quechua, Aymara and Ashaninca).

Control variables: They were of a sociodemographic nature, including age, sex, level of education, whether they had health insurance, ethnicity. In addition, we considered medical history as treatment by a mental health professional, difficulty seeing even with glasses, difficulty hearing even with hearing aids, and difficulty understanding or learning. All variables were obtained through the ENDES survey.

Procedure

The survey was conducted in 2019 through a direct and individual interview in 33,760 homes nationwide. For data collection, a virtual format of the survey was used within a Tablet.

Statistical analysis

It was performed by generating a database; the STATA 15.0 ® software was used.

Descriptive analysis

The description of the exposure variable (native or mother tongue) and the response variable (adherence to treatment) were made using absolute frequencies (N) and relative frequencies (%). Similarly, demographic and clinical characteristics were described. In the case of our numerical variable, it was reported by means and standard deviation due to its normality when performing the Shapiro Wilk test.

Bivariate Analysis

The association between the exposure and response variables was evaluated. As both of the variables were categorical, the chi-square test was applied. Likewise, we performed it to assess the association between each of our categorical control variables with adherence to treatment.

Linear models

Because it was a database analysis, the inferential analyses were exploratory in nature. We carried out generalized linear models at the crude and adjusted level to evaluate the association between native mother tongue and adherence to treatment. We used a Poisson regression. The association measure that we applied was the probability of risk (PR). In the adjusted model, we presented an epidemiological model, based on a bibliography to select the adjustment variables.

Ethical aspects

The performance of this secondary database analysis did not violate any ethical principle for research on human beings since it is a public database with anonymous data. The results of this research will serve as the basis for recognizing new challenges and proposing solutions that have an impact on the benefit of the elderly population. The investigation complied with keeping the data anonymous and confidential.

Result and Discussion

The total population of households surveyed was 33,760. However, after applying the inclusion and exclusion criteria (see figure 1), 1,146 respondents were selected for the study, of whom 234 had a native language as their mother

tongue and 912 Spanish. On the other hand, 1009 respondents had adherence to treatment and 137 did not.

The association between the covariates and the exposure variable (native language) is shown in Table 1. An association was found with ethnicity, sex, level of education, difficulty seeing even when wearing glasses, and difficulty understanding or learning. The males had a higher prevalence of native language (24.35%), as their mother tongue. On the other hand, the most prevalent ethnic group was the mestizo, and with Spanish as the mother tongue (95.85%), Quechua was the second most prevalent ethnic group, being greater than the presence of native language (68.87%). Likewise, with the variable degree of education, we observed that Spanish had a higher percentage value at all levels, reaching a 100% prevalence at the postgraduate level. However, the highest cumulative percentage value of uninsured persons was in the group of older adults with a mother tongue Spanish (85,37). Finally, with respect to Table 1, the difficulty to learn or understand had a higher percentage value in people with a native language, reaching 80%.

Table 1: Sociodemographic characteristics of the mother tongue

	Lengua Materna: Nativa	Lengua materna: Castellano	P
Variable	N = (%) 234	N = (%) 912	
Mean age and standard deviation	71,6(8,1)	70,9(7,93)	
Age			0,772
60 -74	157 (20,03)	627 (79,97)	
75- 90	73 (21,04)	274 (78,96)	
91-97	4 (26,67)	11 (73,33)	
Sex			0,004
Male	122 (24,35)	379 (75,65)	
Feminine	112 (17,36)	533 (82,64)	
Insurance			0,092
Yes	216 (21,11)	807 (78,89)	
Do not	18 (14,63)	105 (85,37)	
Degree of instruction			<0,001
Initial / preschool	3 (42,86)	4 (57,14)	
Primary	176 (27,98)	453 (72.02)	
Secondary	29 (10,36)	251 (89,64)	
Non-University Higher	9 (9,47)	86 (90,53)	
University Superior	17 (13,82)	106 (86,18)	
Postgraduate	0	12 (100)	
Ethnicity			<0,001
Quechua	177 (68,87)	80 (31,13)	
Aymara	23 (67,65)	11 (32,35)	
Indigenous of the Amazon	0	3 (100)	
Afro-American	2 (2,08)	94 (97,92)	
White	3 (4)	72 (96)	
Half Blood	24 (4,15)	555 (95,85)	
Other	1 (4,55)	21 (95,45)	
Does not know	4 (5)	76 (95)	
Treatment by a professional			0,641
mental health in the past 12 months	18 (21,95)	64 (78,05)	
Yes	216 (20,36)	845 (79,64)	
Do not	0	3 (100)	
He does not remember			0,049
Difficulty seeing, even using	19 (30,16)	44 (69,84)	
glasses	215 (19,85)	868 (80,15)	
Yes			0,084
Do not	8 (34,78)	15 (65,22)	

The association between the covariates and the response variable (adherence to treatment) is shown in Table 2, in which we can observe an association with the mother tongue. Similarly, it can be seen that the percentage value of adherence increased directly proportionally to age. In the same way, we see that the percentage value of adherence increased with a higher degree of education of the person. However, both Ps were not significant for both variables. On the other hand, we were able to observe that adherence was higher in older adults who had Spanish as their mother tongue (89.36%).

Table 2: Sociodemographic characteristics of Adherence to Treatment

	Adherence to treatment	Non-adherence to treatment	P
Variable	N = (%)1009	N = (%) 137	
Mean age and standard deviation	71,2(8)	70,1(7,6)	
Age			0,706
60 -74	687(87,63)	97 (12,37)	
75- 90	308 (88,76)	39 (11,24)	
91-97	14 (93,33)	1 (6,67)	
Sex			0,595
Male	444 (88,62)	57 (11,38)	
Feminine	565 (87,60)	80 (12,40)	
Insurance			0,119
Yes	906 (88,56)	117 (11,44)	
Do not	103 (83,74)	20 (16,26)	
Degree of instruction			0,548
Initial / preschool	5 (71,43)	2 (28,57)	
Primary	547 (86,96)	82 (13,04)	
Secondary	249 (88,93)	31 (11,07)	
Non-University Higher	86 (90,53)	9 (9,47)	
University Superior	111 (90,24)	12 (9,76)	
Postgraduate	11 (91,67)	1 (8,33)	
Ethnicity			0,136
Quechua	217 (84,44)	40 (15,56)	
Aymara	26 (76,47)	8 (23,53)	
Indigenous of the Amazon	3 (100)	0	
Afro-American	83 (86,46)	13 (13,54)	
White	66 (88)	9 (12)	
Half Blood	522 (90,16)	57 (8,84)	
Other	20 (90,91)	2 (9,09)	
Does not know	72 (90)	8 (19)	
Mother tongue			0,007
Spanish	815 (89,36)	97 (10,64)	
Native	194 (82,91)	40 (17,09)	
Treatment by a mental health professional in the last 12 months			0,781
Yes	73 (89,02)	9 (10,98)	

In the regression analysis, we observed that in the crude model, the risk of having non-adherence to treatment in people with a native mother tongue was 1.607. Regarding the model adjusted by the epidemiological model, the prevalence of risk was 1.609; this association was shown to be statistically significant.

The findings show that considering the elderly with a diagnosis of chronic diseases such as Arterial Hypertension and Diabetes Mellitus, with treatment and a native mother tongue, the risk of non-adherence to treatment increased when they spoke a native language; therefore, they did not comply with the assigned health therapy.

Likewise, the relevance of these results is explained by the fact that most health personnel consider that non-adherence is due to lack of access to or forgetting about medications [4], without taking into consideration other influencing factors like the language barrier between patient and healthcare provider [16]. The baseline risk for a person not adhering to their treatment is 50% [4]. Consequently, we have patients and especially older adults, with more visits to health centers, with recurrences and complications due to their hospital stays and chronic diseases, generating greater expenditure of resources for the state, health systems and families. Therefore, the study from the improvement of interculturality in the native language of our health system can contribute to a lower rate of readmission due to complications and a lower expenditure of resources from the health system and family members, promoting successful aging to through self-care.

In the present study, the probability of risk of not having adherence to treatment in older adults with a native language is 1,607 times compared with that of older adults with the Spanish language. Similar results were found in a study in a Latino population with limited use of English having a risk of 1.49 of poor adherence to treatment compared with English speakers [10]. Similarly, a study in the United States evaluating primary adherence to statins found an OR of 1.32 in Spanish-speaking patients, with respect to adherence to treatment compared to English-speaking people [9].

It is noted that the study showed an association with the variable native mother tongue [2]. The present work shows that there is no association between the person's age and their adherence to treatment; similar results were found in a retrospective cohort-type study in the USA [23]. However, a study conducted in 2008 differs from our results since they did find an association with age [14]. Another important variable, with which no association was found, is the ethnicity of the elderly, results that were consistent with two studies [9, 23]. However, a study found (2103) an association with the black race, finding in them 30% more non-compliance compared with other ethnicities [6].

We indicated the fact of being a secondary analysis of a large population and with a probability sampling. Likewise, the self-report took into consideration ethnicity [6, 9, 23], educational level [11] and age [6, 7]. Although these variables can influence our outcome, having collected them allowed us to control them and avoid potential errors. In the same way, the results obtained by the study made it possible to focus comprehensively on the elderly native language patient and to apply new forms of treatment and management in public policies.

However, there were certain limitations. The first was the data collection method through reporting; this type of modality can cause an overestimation and/or underestimation, because there may be an unclear memory in its entirety at the time of giving your answers. However, the self-report of DM shows a sensitivity of 63.8% and a specificity of 99.7% [9]. Likewise, the self-report of HT presented a sensitivity of 42.1% and a specificity of 89.5% [13]. Another important limitation within the study was the exclusion of people diagnosed who were not receiving treatment and the failure to count the number of chronic diseases suffered by the elderly. Since this would mean an underestimation of the number of selected older adults, statistical regression models were performed to control for covariates and possible confounding variables.

Conclusion

If the patient presents a language different from that of the treating physician, it is more likely that the treatment will not be complied with. This means that an intercultural approach must be taken towards the patient; therefore, the entire health team must be prepared to provide all treatment, information, and follow-up to the patient within their mother language.

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Authors' contributions
All authors contributed toward data analysis, drafting and revising the paper and agreed to be responsible for all the aspects of this work.

Conflict of Interest
The authors declare no conflicts of interest.

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