

Evaluation of knowledge of the term "nephrology" in a population sample

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ABSTRACT

Introduction: The consolidation of nephrology as a medical specialty is relatively new and its denomination does not intuitively reflect its true scope. **Objective:** To assess the degree of knowledge from a population sample regarding the term "nephrology". **Methods:** We carried out a cross-sectional study in Niterói, RJ, with adult passerby individuals answering to the question "Do you know what nephrology is?". The variables recorded included: gender, age, skin-color, residence, income, educational level and kidney-disease history in the family. *p* values <0.05 were considered significant. **Results:** Of the 564 individuals asked, 504 were willing to answer. Of those who refused, 64% were males, 58% caucasians - from whom 85% were aged > 30 years. The mean age among participants was 39 (22-56) years, 49% were males and 56% caucasians. Twenty-eight percent of the interviewees knew the term "nephrology". Their knowledge came from school (39%) and family (30%). Those who knew about the term "nephrology" were older (42 ± 17 vs. 39 ± 17 years, $p < 0.05$), had higher income (R\$ 4,522 vs. R\$ 2,934, $p < 0.05$) and higher education (27% vs. 12% with complete higher education, $p < 0.001$). They were predominantly caucasians (64% vs. 53%, $p = 0.001$), and had a higher rate of renal disease in the family (55% vs. 36%, $p < 0.001$). In the multivariate analysis, associations were maintained for age (OR 1.02; 95% CI 1.00 to 1.03, $p = 0.004$); higher education (OR 10.60, 95% CI, 4.20 to 26.86, $p < 0.001$) and kidney disease in the family (OR 2.2, 95% CI, 1.40 to 3.41, $p < 0.001$). **Conclusions:** Only 28% knew the term "nephrology", illustrating the specialty's low penetration. We must strive to popularize this field of medicine aiming at better educating the population concerning the prevention and care of kidney diseases.

Keywords: nephrology; population; renal insufficiency, chronic.

INTRODUCTION

Nephrology names the area of medical expertise dedicated to the diagnosis and treatment of urinary tract diseases, particularly the ones connected to the kidneys.

The dawn of this medical specialty dates back to the studies developed in the 19th century by Richard Bright and other researchers.¹ The early 20th century saw the graduation of the first physicians specialized on nephrology, along with the first specific pieces of medical equipment and training programs. The development and popularization of kidney transplantation and dialysis procedures in the 1950s were important landmarks in the consolidation of this field of medicine.^{2,3}

The origin of the word "nephrology" ("*nephros*", for kidney, and "*logy*", for "the study of") dates back to the descriptions of urinary disorders, renal anatomy, and kidney diseases made in Ancient Greece. However, the non-medical population may experience some difficulty understanding it, as the meaning of the word is not so evidently connected to its spelling.

This study aimed to assess how well a sample of the population understood the word "nephrology".

METHOD

This population study was carried out in the city of Niterói, Brazil. Adult subjects (above 18 years of age) passing by Araribóia square, across from the Niterói-Rio de Janeiro ferry station, were invited to share their thoughts on the word "nephrology". Five students from the Nephrology League of the Fluminense

Federal University spent a business day (May 25, 2012) asking the question ("Do you know what nephrology is?") to passers by from 8 a.m. to 6 p.m.. In addition to the question, subjects were asked about their gender, age, ethnicity, residential address, income level, schooling, and cases of renal disease in their families.

The skin color or ethnicity of the participants was assigned by members of the study. Subjects were categorized as white, brown, or black. Income levels were categorized as per the criteria defined by the Brazilian Institute of Geography and Statistics (*Instituto Brasileiro de Geografia e Estatística - IBGE*), which divides the population on five tiers according to monthly household income. Subjects in class "A" have incomes above 20 Brazilian minimum wages (MW); class "B" members make between 10 and 20 MW; "C" ranges from four to 10 MW; subjects on "D" make from two to four MW; and "E" members make up to two MW.⁴ The answers were captured in paper forms and transferred later to a data spreadsheet software. The study complied with the ethical standards dictated by the Declaration of Helsinki of 1975, revised in 2000. Interviewee identity was protected and no diagnostic or therapeutic interventions were made. Therefore, the study did not require the approval of the institution's ethics committee and participants did not have to give informed consent.

STATISTICAL ANALYSIS

The results of continuous variables were expressed in the form of mean values and standard deviations; categorical variables were noted in absolute and relative frequencies. The differences between mean values were assessed through a two-tailed unpaired *t*-test. Frequencies were compared using the Chi-square test. Correlations were analyzed through logistics regression. Statistical significance was assigned when *p* < 0.05. Statistical tests were carried out on software package PASW Statistics 18 (Chicago, IL, USA).

RESULTS

A total of 564 people were approached, and 504 (89.4%) agreed to be interviewed. The subjects who refused to participate were predominantly men (64%), white (58%), and aged above 30 years (85%). Table 1 contains the characteristics of the individuals included in the study. Included subjects had a mean

age of 39 (22-56) years, 49% were males, 56% were white, and 42% lived in the city of Niterói. Forty-one percent of the interviewees were aware of at least one family member with kidney disease.

TABLE 1 POPULATION CHARACTERISTICS

N	504
Age, years	39 ± 17 ^a
Gender (M/F) ^b , %	49/51
Skin color, %	
White/brown/black	56/21/23
Education, %	
Elementary school (C/I) ^c	12/11
Middle school (C/I) ^c	12/27
Higher (C/I) ^c	18/20
City, %	
Niterói/Rio/São Gonçalo/other	42/15/29/14
Income ^d , %	
A/B/C/D/E	3/7/39/21/30
Cases of renal disease in the family (Y/N) ^e , %	41/59
Knowledge of nephrology, (Y/N) ^e , %	28/72

^a Mean ± standard deviation; ^b M: Male; F: Female; ^c C: Complete; I: Incomplete; ^d Social class criteria from IBGE⁴; ^e Y: Yes; N: No.

The word "nephrology" was known to 28% of the participants. Such knowledge was acquired mostly through formal education (39%) or contact with it in the family (30%) (Table 2).

TABLE 2 SOURCE OF KNOWLEDGE ON NEPHROLOGY

N	140
Family, f ^a (%)	42 (30)
Friends, f ^a (%)	13 (9)
Media, f ^a (%)	11 (8)
School, f ^a (%)	54 (39)
Other, f ^a (%)	20 (14)

^a Frequency.

The data of the subjects who knew and did not know the word "nephrology" were compared to elicit the factors that could affect the knowledge of the term (Table 3). Individuals who knew the meaning of nephrology were older (42 ± 17 *vs.* 39 ± 17 years, *p* < 0.05), had higher income levels (R\$ 4,522 *vs.* R\$ 2,934, *p* < 0.05), and were more educated (27% and 40% *vs.* 12% and 14%, higher education degree holders and people with unfinished higher studies, respectively; *p* < 0.001).

Additionally, most of the subjects who knew the word nephrology were white (64% vs. 53%, $p = 0.001$) and had more cases of renal disease in their families (55% vs. 36%, $p < 0.001$).

TABLE 3 CHARACTERISTICS OF THE POPULATION UNAWARE OF THE MEANING OF THE TERM "NEPHROLOGY"

	No (N = 364)	Yes (N = 140)	<i>p</i>
Gender, (M/F) ^a , %	52/48	40/60	0.14
Age, years	39 ± 17 ^b	42 ± 17 ^b	< 0.05
Income, R\$	2934.00	4522.00	< 0.05
Education, %			< 0.0001
Elementary school (C/I) ^c	16/12	5/6	-
Middle school (C/I) ^c	14/32	6/16	-
Higher (C/I) ^c	12/14	27/40	-
City, %			0.11
Niterói/Rio/São Gonçalo/other	39/14/34/13	50/16/19/15	-
Skin color, %			0.001
White/black/brown	53/25/22	64/10/26	-
Cases of renal disease in the family, (Y/N) ^c , %	36/64	55/45	< 0.0001
Income (range) ^b			< 0.0001
A/B/C/D/E	2/5/36/23/34	4/13/51/14/18	-

^a M: Male; F: female; ^b Mean ± standard deviation; ^c Y: Yes; N: No; ^d Social class criteria from IBGE⁴.

Multivariate analysis revealed positive correlations with age (OR 1.02, 95% CI 1.00-1.03, $p = 0.004$), unfinished higher education studies (OR 8.25, 95% CI 2.98-22.94, $p < 0.001$), higher education degree (OR 10.60, 95% CI 4.20-26.86, $p < 0.001$), and cases of kidney disease in the family (OR 2.2, 95% CI 1.40-3.41, $p < 0.001$) (Table 4).

Sixteen (4.4%) of the 364 participants who did not know the word "nephrology" did not care to learn its meaning during the interview. The members of this subgroup were predominantly male (94%), brown (50%), had a mean age of 36 (20-52) years, belonged to class C (31%), and had not finished elementary school (31%).

DISCUSSION

The exact share of the population acquainted with the word "nephrology" is not known. This study looked into a sample of the population in the city of Niterói, Brazil.

TABLE 4 CHARACTERISTICS THAT IMPACTED THE KNOWLEDGE OF THE WORD "NEPHROLOGY" - MULTIVARIATE ANALYSIS

Variable	OR (95%)		<i>p</i>
Gender	0.68	(0.44-1.05)	0.090
Age	1.02	(1.00-1.03)	0.004
Educational level			
Incomplete elementary education (Ref.)	1.00	-	< 0.0001
Complete elementary education	1.54	(0.51-4.62)	0.440
Incomplete middle school	1.76	(0.58-5.36)	0.320
Complete middle school	1.65	(0.63-4.29)	0.300
Incomplete higher education	8.25	(2.98-22.94)	< 0.0001
Complete higher education	10.60	(4.20-26.86)	< 0.0001
City	1.02	(0.85-1.23)	0.840
Color			
White (Ref.)	1.00	-	0.120
Black	0.58	(0.29-1.16)	0.120
Brown	1.29	(0.77-2.18)	0.350
Renal disease in family	2.20	(1.40-3.41)	< 0.0001

Ref.: Reference value used for analysis.

The low number of people aware of the correct meaning of the word "nephrology" (28%) reflects the local population's lack of knowledge on the topic. Few publications have investigated the knowledge the population in general has of medical specialties, and none discussed how well nephrology is known by Brazilians. A study carried out in 2009 with 150 individuals from Burlington, USA, and Sherbrooke, Canada, on what they knew about urology found that 75% knew little or nothing about it, while 63% were unaware that urology contemplated surgical procedures.⁵ A similar study done in 2012 in Jeddah, Saudi Arabia, revealed that 66% of the 154 participants knew little or nothing about urology.⁶ Other authors have assessed how much the population knew about medical terms commonly discussed in the media such as stroke,⁷⁻⁹ HIV,¹⁰ cardiovascular disease,⁸ and first aid.¹¹

However, very little information is available on nephrology. White *et al.* interviewed 852 individuals in Australia to quantify how much they knew of the risk factors for chronic kidney disease and found that only 2.8% and 8.6% were able to cite systemic hypertension and diabetes, respectively.¹² Waterman *et al.* carried out a study in the USA with 2,017 African Americans and found that 48.6% of the participants knew the correct definition of chronic kidney disease

and 23.7% were aware of at least one diagnostic test for the condition.¹³ These percentages were considered low by the authors.

The situation in Brazil is preoccupying, as almost two thirds of the participants had no idea of what nephrology meant. The literature contains accounts of the lack of knowledge patients with end-stage renal disease have of their condition¹⁴ and the little interest and knowledge nursing graduates from a private university in São Paulo have on nephrology as an area of medical expertise.¹⁵

The factors that contributed to higher rates of association between the word and its meaning were older age, higher education, and family members with renal disease.

The low level of education observed among study participants may explain the lack of knowledge of the word "nephrology", as formal education was indicated as the main source of knowledge of the term. A small portion of the Brazilian population holds higher education degrees. The Brazilian Census of 2010 organized by the IBGE revealed that 5.9%-14.4% of the population aged 15 and over was illiterate, while only 12.8%-31.1% of the individuals aged 15-24 years attended higher education institutions.¹⁶ Although the census included individuals outside the age range of college students (and different from the age range of this study), published data indicate that the number of Brazilians attending higher education institutions is still low.

Older age and cases of renal disease in the family increased the odds of subjects knowing the meaning of nephrology, possibly due to greater exposure to health care in general or to the medical specialty at hand.

São Paulo and Rio de Janeiro have played a fundamental role in the development of nephrology in Brazil as a consequence of the studies and technologies developed in these states.¹⁷ Nonetheless, scientific knowledge in this area has been confined to universities and specific hospital services. Efforts have been made in recent years to enhance the exchanges between universities and the Brazilian Nephrology Association¹⁸ and foster initiatives aimed at building the awareness of the population on renal diseases.

The correlation between some of the variables such as white skin and higher income levels and knowledge of the meaning of nephrology is worthy of further discussion. Economic disparity and skin color

have been connected to limited upward mobility in Brazilian society; fewer individuals of lower income tiers, browns, and blacks are admitted to basic and higher education institutions. According to the 2010 IBGE Census, six percent of the white population aged 15 years and above was illiterate, against 13% and 14% of browns and blacks, respectively. Only 12.8% of blacks and 13.4% of browns aged 15-24 years had access to higher education, against 31.1% of whites in the same age group.¹⁶ The loss of statistical significance of the effect of skin color and income in multivariate analysis reinforces the idea that the problem seems to reside in difficulty having access to education.

The media had little impact on the knowledge of the word "nephrology" by the population. Only 8% of the interviewees pointed to the media as the source of knowledge on nephrology. Many authors have supported this finding and indicated that health campaigns run in the media had low to moderate impact in transmitting knowledge and behavior changes to the population.¹⁹ Nonetheless, the growing influence of the media in providing clarification to the population cannot be ignored.

Mapping the level of knowledge of the population on a particular matter is of great importance in the assessment of the investment required to attenuate lack of information. From this point, educational measures can be planned to provide the public with the needed clarification. Knowledge of a medical specialty or disease risk factors may result in early diagnosis and treatment, reduced morbimortality, and lower health care costs.^{5,7}

The main drawback of this study was the application of the questionnaire in one single site, which limited the possibilities of extrapolating the results to the entire country of Brazil. According to the United Nations Development Program, Niterói is the municipality with the third highest HDI in Brazil.²⁰ Most of the participants included in the study (41%) were from Niterói, thus it is possible that the situation in other Brazilian cities is even worse.

CONCLUSION

The low percentage of people who knew the word "nephrology" (28%) revealed the population's significant lack of knowledge in this area. More exposure of this medical specialty in the media might contribute to mitigate the lack of information. However, our

data suggested that more investment in formal education might be more effective in changing this scenario. A better informed population is expected to contribute more to the prevention and earlier treatment of renal diseases.

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