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# Knowledge and perceived self-efficacy and collective efficacy of health professionals to implement the Brazilian Dietary Guidelines in Primary Health Care

## *Conhecimento e percepção de autoeficácia e eficácia coletiva de profissionais de saúde para a implementação do Guia Alimentar na Atenção Básica*

**Abstract**

***Objective:*** This study compared the knowledge and perceived self-efficacy and collective efficacy to apply the Brazilian Dietary Guidelines (Dietary Guidelines) among nutritionists and other health professionals working in primary health care. ***Methods:*** The performance of 209 participants in a construct validation study of two scales was analyzed: GAB1 (knowledge) and GAB2 (self-efficacy and collective efficacy). Groups percentile (<75 and > 75) were generated and the differences between quantitative/qualitative variables and being a nutritionist were tested. Bivariate and multiple logistic regression models were used to investigate the explanatory variables of each construct. ***Results:*** Nutritionists had mean knowledge and perceived self-efficacy statistically higher than other professions. We observed association between being a nutritionist and high knowledge and

perceived self-efficacy to apply the Dietary Guidelines. Being a nutritionist and having high perceived self-efficacy proved to be determinants of high knowledge about the Dietary Guidelines. Being a nutritionist and having high knowledge about the Dietary Guidelines showed to be determinants of high perceived self-efficacy. Nutritionists' mean collective efficacy was not statistically different than other professions. No variable was found to be predictive of high collective efficacy. ***Discussion:*** To our knowledge, this is the first study to evaluate the readiness of health professionals to implement the Dietary Guidelines in Primary Healthcare, showing the urgent need of effective professional training to consolidate the nutritionist as technical reference for other professionals. ***Conclusions:*** Being a nutritionist was associated with higher knowledge and perceived self-efficacy to apply the Dietary Guidelines, but collective efficacy was not associated with the profession.

**Keywords:** Food Guide. Primary Healthcare. Health Personnel. Self-Efficacy. Continuing Education.

**Resumo**

***Objetivos:*** Este estudo comparou o conhecimento e a percepção de autoeficácia e eficácia coletiva para aplicar o ***Guia Alimentar para a População Brasileira*** [Guia Alimentar] entre nutricionistas e demais profissionais de saúde da Atenção Básica. ***Métodos:*** Analisou-se o desempenho de 209 participantes em estudo de validação de constructo de duas escalas: GAB1 (conhecimento) e GAB2 (autoeficácia e eficácia coletiva). Geraram-se grupos segundo percentil (<75 e >75) e testaram-se as diferenças entre variáveis quantitativas/qualitativas e ser nutricionista. Razões de chance por modelos de regressão logística bivariada e múltipla foram calculadas para investigar as variáveis explicativas de cada constructo. ***Resultados:*** A média de conhecimento e autoeficácia dos nutricionistas foi estatisticamente superior a das outras profissões, observando-se associação entre ser nutricionista e elevado conhecimento e autoeficácia para aplicar o Guia Alimentar. Ser nutricionista e possuir elevada autoeficácia mostraram-se determinantes para elevado conhecimento sobre o Guia Alimentar. Ser nutricionista e possuir elevado conhecimento sobre o Guia Alimentar mostraram-se determinantes para elevada autoeficácia. A média de eficácia coletiva dos nutricionistas não foi estatisticamente diferente a das outras profissões. Nenhuma variável se mostrou explicativa para elevada eficácia coletiva. ***Discussão:*** Pelo nosso conhecimento, este estudo é o primeiro a avaliar o preparo de profissionais de saúde para implementar o Guia Alimentar, salientando a urgência de processos eficazes de capacitação profissional para consolidar o nutricionista como referência técnica para os demais profissionais. ***Conclusões:*** Ser nutricionista associou-se ao maior conhecimento e à maior autoeficácia para aplicar o Guia Alimentar, mas a eficácia coletiva não esteve associada à profissão.

**Palavras-chave:** Guias alimentares. Atenção Primária à Saúde. Pessoal de saúde. Autoeficácia. Educação continuada.





## INTRODUCTION

The second edition of the Dietary Guidelines for the Brazilian Population (Dietary Guidelines), published in 2014 by the Ministry of Health of Brazil,[1] announced a new paradigm of healthy eating, constituting a tool for dietary counseling with recommendations focused on the empowerment of subjects to make healthier, more pleasurable, autonomous and conscious food choices. This instrument incorporates social, cultural, economic and environmental sustainability dimensions and presents recommendations for nutrition of the body, soul, mind, and for preservation and protection of our planet and the biosphere.[2]

To implement the Dietary Guidelines recommendations has become a commitment of the Brazilian government towards the universalization of access to healthy foods.[3] In this context, training facilitators to implement the Dietary Guidelines, among them, health care providers, was considered by the Food and Agriculture Organization (FAO) of the United Nations as a key element to support this process.[4]

Brazil has incorporated continuing education into several public policies and official documents, as a strategy for qualification of health professionals to promote adequate and healthy diets, according to the health needs of users of the ***Sistema Único de Saúde*** – SUS (Unified Health System).[5-9] Among these documents, the National Primary Health Care Policy confirms the need to transform the team work process so that health professionals may improve their analysis, intervention and autonomy skills for the establishment of transforming practices.[6]

In this regard, Social Cognitive Theory (SCT) of Albert Bandura, a behavioral theory widely used in the design of educational health interventions,[10-12] identifies the diverse influencing constructs or learning processes. SCT recognizes the human behavior as a product of a dynamic conjunction of personal, behavioral and environmental influences.[13]

Among these constructs, knowledge is considered by Bandura as a precondition for changes towards health promotion through cognitive social means.[14] Lack of knowledge, in turn, puts individuals in a situation where few reasons are found for a behavioral change. SCT emphasizes that, in addition to knowledge, perceived self-efficacy is crucial because the greater the belief in self-efficacy the greater will be the goals that individuals establish for themselves and the commitment undertaken to achieve them, even in the presence of an obstacle.[14] SCT also considers that people do not act alone. Thus, beliefs shared by individuals in collective efficacy to accomplish a change plays a key role in public policies for health promotion and disease prevention.[14]

According to Lindemann et al.,[15] health professionals are considered fundamental in the health education process and must adapt the actions of healthy eating promotion to the difficulties and obstacles experienced by the population. However, since the publication of the Dietary Guidelines there has been no literature available on appropriate implementation of these guidelines in Primary Health Care (PHC) and training of health care providers to use its recommendations.

Given the above, the present study aimed to compare the knowledge and perceived self-efficacy and collective self-efficacy to apply the Dietary Guidelines by nutritionists and other health professionals working in PHC.

## METHODS

This is a descriptive cross-sectional study designed to compare performance patterns of nutritionists and other health professionals working in PHC in a validation study of two self-applicable scales guided by the Dietary Guidelines. The first scale, named GAB1, presents 16 items with three options of answers (***"false", "true" and "don't know"***) and measures the knowledge of these professionals of the recommendations described in the five chapters of the Dietary Guidelines. The second scale (GAB2), comprised of 24 items with 4-point answers in the Likert scale, is divided into two dimensions to assess the perceived self-efficacy (1=not confident to 4= very confident) and collective efficacy (1=false to 4=very true) to apply this document in healthy eating promotion actions.

While GAB1 directly measures the knowledge of health professionals on the contents of the Dietary Guidelines, GAB2 evaluates the perceived self-efficacy to apply this instrument, as well as the perceived performance of the work team (collective efficacy). Therefore, the contents addressed in the items of the GAB2 self-efficacy dimension correspond to the contents of the items of the collective efficacy dimension, according to the examples described in Chart 1.





GAB1 and GAB2 underwent content, face and construct validation processes. The present research was conducted with the sample of participants of the construct validation study to compare the response patterns of nutritionists with other professionals working in PHC. We decided to work with these data as the scales were considered effective and accurate to evaluate professionals with low level of knowledge (below average) of the Dietary Guidelines and perceived self-efficacy and collective efficacy in the mean.

**Chart 1.** Examples of items of GAB1 and GAB2, 2017

| Scale | Examples of item | Answer options |
|---|---|---|
| GAB1<br>(Scale to measure the knowledge of primary health care professionals about the contents of the Dietary Guidelines) | *A diet where ultra-processed foods predominate is cheaper than diets with predominance of natural or minimally processed foods* | 1- True<br>2- False<br>3- Don't know |
| GAB2<br>(Scale to measure the perceived self-efficacy and collective efficacy of primary health care professionals to apply the Dietary Guidelines: self-efficacy dimension) | *I am capable of advising the users of the health care services on how to save money when buying healthy foods* | 1- Not at all confident<br>2- Somewhat confident<br>3- Confident<br>4- Very confident |
| GAB2<br>(Scale to measure the perceived self-efficacy and collective efficacy of primary health care professionals to apply the Dietary Guidelines: collective efficacy dimension) | *My team is capable of advising the users of health care services on how to save money when buying healthy foods* | 1- False<br>2- Sometimes true<br>3- True<br>4- Very true |

With respect to the construct measured by GAB1, knowledge in psychology is understood as a condition to explain important aspects of the world and predict events, and may be grouped into declarative (knowing what things and processes are) and procedural (knowing how to make things and processes).[16]

Regarding the constructs measured by GAB2, self-efficacy is defined as the confidence or belief in the ability that an individual has to adopt certain behavior, while collective efficacy is the confidence or belief in the ability of a group to act toward the achievement of desired changes and the willingness of the members of a community to support one another.[13]

Through the researchers' social networking website and the website of the ***Faculdade de Saúde Pública/USP*** (School of Public Health/USP), the study population was invited to access the online platform specially developed to collect data, which took place between April and June 2017. To avoid duplicity of responses, the platform was programmed to register the IP address of the respondent's computer. Eligible participants included health practitioners working in the PHC for at least one year. The platform included a section for personal information and the respondent's work experience and then it started recording the responses of GAB1 and GAB2.

A descriptive analysis of the respondents' characteristics (nutritionists and other professions) was carried out, the qualitative variables being described in absolute and relative values, and the quantitative variables in their central tendency values and dispersion. All missing answers relating to the respondents' characterization were excluded from the analysis. The Shapiro-Wilk test was used to verify the normality of data distribution.

The total sum of correct answers of each respondent for GAB1 (knowledge of Dietary Guidelines), considering "don't know" answer as incorrect, was calculated and classified into two groups: "***high knowledge***" (75$^{th}$ percentile or over) and "***low knowledge***" (below the 75$^{th}$ percentile).

The results of application of GAB2 were grouped according to each dimension: the performance in the 12 items of self-efficacy generated the groups "***non-confident***" (answers recorded as "***not at all confident***" and "***somewhat confident***") and "***confident***" groups (answers recorded as "***confident***" and "***very confident***"), and the 12 items of collective efficacy generated the groups "***false***" (answers recorded as "***false***" and "***sometimes true***") and "***true***" (answers recorded as "***true***" and "***very true***"). The percentiles of the sum of "***confident***" and "***true***" answers were calculated to classify them into two groups: the 75$^{th}$ percentile or above (respondents with "***high self-efficacy***" and "***high collective efficacy***") and below the 75$^{th}$ percentile (respondents with "***low self-efficacy***" and "***low collective efficacy***").

The differences between the quantitative variables and "being a nutritionist" were tested with the Mann-Whitney test, and the association between the qualitative variables and "being a nutritionist" was evaluated with the Fisher's exact test.

As a measure of association between the high level of knowledge of the Dietary Guidelines (75$^{th}$ percentile or over) and the variables that possibly explain it (being a nutritionist, age, sex, time of experience in PHC, working in the Family Health Support Nucleus, higher education, perceived self-efficacy and perceived collective efficacy), the odds ratio (OR) was calculated by bivariate and multiple logistic regression models. In the multiple models, the variables that had a p-value below 0.20 were included. The same procedure was followed to evaluate the association between high perceived self-efficacy (***high self-efficacy***) and collective efficacy (***high collective efficacy***) with possible explanatory variables. All statistical analyses were carried out using the STATA software, version 13.1, and the level of significance adopted was lower than or equal to 0.05.





This research was approved by the Research Ethics Committee of the Faculdade de Saúde Pública/USP (School of Public Health of the University of São Paulo), protocol number 56303716.6.0000.5421. Participation was voluntary and all participants signed the Informed Consent.

## RESULTS

GAB1 and GAB2 were submitted to construct validation through factorial analysis with 209 health professionals working in PHC, and among them 133 (63.6%) were nutritionists. Other professions included 32 nurses (15.3%), eight physicians (3.8%), eight community health agents (3.8%), five social workers (2.4%), five speech therapists (2.4%), five psychologists (2.4%), five physical education professionals (2.4%) and eight professionals of diverse areas (3.8%). All Brazilian macro-regions were represented in this study: 52.2% of health practitioners worked in the Southeast; 20.1% in the South; 17.2% in the Northeast; 6.7% in the Midwest; and 3.8% in the North.

Table 1 shows the respondents' descriptive variables according to their professions. Mean age was 38 years (standard deviation - SD = 9.05); the nutritionists' mean age being 37 years (SD = 9.12), statistically different (p=0.002) from other health professionals (40 years, SD=8.55). In addition to age, both groups showed differences in sex distribution, time of experience in PHC, working in the Family Health Support Nucleus and higher education.

The average number of correct answers of nutritionists in GAB1 was statistically higher (14.18, SD=1.71) than other professions (11.52, SD=2.47) (p=0.000). Table 2 shows the existing association between being a nutritionist and the high level of knowledge about the Dietary Guidelines.

The descriptive results for GAB2 performance demonstrated that the nutritionists' average perceived self-efficacy was 9.42 (SD=1.98), while in other professions it was 6.31(SD=2.94), being statistically different (p=0.000). Table 2 shows the existing association between being a nutritionist and the high perceived self-efficacy to apply the Dietary Guidelines.

Finally, the nutritionists' mean score obtained for perceived collective efficacy (GAB2) was 4.93 (SD=3.94), while for other professions it was 5.46 (SD=3.54); not statistically different (p=0.189). Table 2 demonstrates that there was no statistically significant association between the profession and the perceived collective efficacy to apply the Dietary Guidelines.

**Table 1.** Sociodemographic characteristics according to the respondent's profession, 2017.

| Variable | Nutritionists | Other Professionsc |
|---|---|---|
| | N (%) | |
| Age (N=208)[a] | | |
| < 25 years | 4 (3,03) | 0 (0,00) |
| 25 a 34 years | 56 (42,42)b | 19 (25,00) |
| 35 a 44 years | 46 (34,85) | 33 (43,42) |
| 45 a 54 years | 17 (12,88) | 20 (26,32) |
| 55 years or over | 9 (6,82) | 4 (5,26) |
| Total | 132 (100,00) | 76 (100,00) |
| Sex (N=209) | | |
| Female | 128 (96,24)[b] | 63 (82,89) |
| Male | 5 (3,76) | 13 (17,11) |
| Total | 133 (100,00) | 76 (100,00) |
| Time of experience in PHC | | |
| < 5 years | 54 (40,60) | 18 (23,68) |
| 5 years or over | 79 (59,40)b | 58 (76,32) |
| Total | 133 (100,00) | 76 (100,00) |
| Experience in the Family Health Support Nucleus (N=209) | | |
| Yes | 58 (43,61) | 20 (26,32) |
| No | 75 (56,39)b | 56 (73,68) |
| Total | 133 (100,00) | 76 (100,00) |
| Higher education (N=209) | | |
| Yes | 133 (100,00)b | 67 (88,16) |
| No | 0 (0,00) | 9 (11,84) |
| Total | 133 (100,00) | 76 (100,00) |
| Time since graduation (N=200)a | | |
| Up to 10 years | 65 (48,87) | 27 (40,30) |
| > 10 years | 68 (51,13) | 40 (59,70) |
| Total | 133 (100,00) | 67 (100,00) |





**Table 1.** Sociodemographic characteristics according to the respondent's profession, 2017. (cont.)

| Variable | Nutritionists | Other Professionsc |
|---|---|---|
| | N (%) | |
| Post-graduation (N=200)[a] | | |
| Yes | 114 (85,71) | 51 (76,12) |
| No | 19 (14,29) | 16 (23,88) |
| Total | 133 (100,00) | 67 (100,00) |
| Macro-regions of practice (N=209) | | |
| North | 7 (5,26) | 2 (2,63) |
| Northeast | 22 (16,54) | 13 (17,11) |
| Midwest | 13 (9,77) | 2 (2,63) |
| Southeast | 65 (48,87) | 44 (57,89) |
| South | 26 (19,55) | 15 (19,74) |
| Total | 133 (100,00) | 76 (100,00) |

[a] Missing = answers not provided

[b] Fisher's exact test p<0.05

[c] Other professions: nurses, physicians, health community agents, social workers, speech therapists, psychologists, physical education professionals and other professionals from diverse areas.

**Table 2.** Respondents' knowledge and perceived self-efficacy and collective efficacy according to profession, 2017.

| | Nutritionists | Other Professions | Total |
|---|---|---|---|
| Knowledge – GAB1 (category) | | N (%) | |
| 1st to 3rd quartile | 66 (49.62) | 66 (86.84) | 132 (63.16) |
| 4th quartile | 67 (50.38)a | 10 (13.16) | 77 (36.84) |
| Self-efficacy – GAB2 (category) | | N (%) | |
| 1st to 3rd quartile | 76 (51.14)a | 70 (92.11) | 146 (69.86) |
| 4th quartile | 57 (42.86) | 6 (7.89) | 63 (30.14) |
| Collective efficacy – GAB2 (category) | | N (%) | |
| 1st to 3rd quartile | 94 (70.68) | 53 (69.74) | 147 (70.33) |
| 4th quartile | 39 (29.32) | 23 (30.26) | 62 (29.67) |

[a] Fisher's exact test p<0.05

Among the possible explanatory variables for having a high knowledge of the Dietary Guidelines (75th percentile or over of correct answers in GAB1), are being a nutritionist and having high perceived self-efficacy (75th percentile or over in GAB2 – self-efficacy), as can be seen in Table 3.

In the multiple model, being a nutritionist was an important factor for having high knowledge of the Dietary Guidelines, with a fivefold chance of being above the 75th percentile of correct answers in GAB1, when compared with other PHC practitioners, adjusted by higher education and high perceived self-efficacy in GAB2 (Table 3).

The possible explanatory variables for having high perceived self-efficacy (above the 75th percentile in GAB2) are "being nutritionist" (Table 4) and "having high knowledge on the Dietary Guidelines" (above the 75th percentile of correct answers in GAB1), as shown in Table 3.

In the multiple model, being a nutritionist was a key factor for high perceived self-efficacy, with sevenfold more chances when compared with other PHC professionals, adjusted for "working in Family Health Support Nucleus", "having high knowledge of the Dietary Guidelines" (75th percentile or more of correct answers in GAB1) and by the "high perceived collective efficacy" (75th percentile or more in GAB2) (Table 4).

Among the possible explanatory variables for having a high perceived collective efficacy (75th percentile or above in GAB2), none of them was statistically significant (Table 4). As in the bivariate model, in the multiple model no explanatory variable was an important determinant for collective efficacy (Table 4).

## DISCUSSION

The present study aimed to compare the readiness of nutritionists and other health professionals (not nutritionists) working in PHC for application of the Dietary Guidelines in healthy eating promotion actions. Such readiness was assessed by analyzing the level of knowledge of these two groups about the recommendations of the cited publication of the Ministry of Health,1 as well as the perceived self-efficacy and collective efficacy to use them in their educational interventions. The results described in this study are part of the two-scale construct validation step (GAB1 and GAB2).

The overall performance analysis of the GAB1's respondents concluded that being a nutritionist and having high perceived self-efficacy were explanatory variables for the high knowledge on the Dietary Guidelines with fivefold more chances of nutritionists falling above the 75th percentile or correct answers, if compared to the other PHC professionals. Likewise, being a nutritionist and having high knowledge of the Dietary Guidelines were explanatory variables for





**Table 3.** Odds ratio *(OR)* and adjusted odds ratio (ORa) with respective confidence intervals and *p* value for the 75th percentile or over as obtained for GAB1 (knowledge) according to the variables of interest, 2017.

| | OR [IC95%] | *P* |
|---|---|---|
| Nutritionist (Reference: not being a nutritionist) | 1 | |
| Being a nutritionist | 6.70 [3.17-14.14] | 0.000 |
| Age (Reference: <25 years) | 1 | |
| 25 to 34 years | 1.89 [0.18-19.06] | 0.589 |
| 35 to 44 years | 1.83 [0.18-18.47] | 0.606 |
| 45 to 54 years | 1.11 [0.10-11.96] | 0.931 |
| 55 years or more | 2.57 [0.20-31.70] | 0.461 |
| Sex (Reference: Female) | 1 | |
| Male | 1.10 [0.40-2.96] | 0.851 |
| Time of experience in Primary Health Care (Reference: <5 years) | 1 | |
| > 5 years | 0.95 [0.53-1.72] | 0.886 |
| Experience in the Family Health Support Nucleus (Reference: No) | 1 | |
| Yes | 1.02 [0.57-1.82] | 0.938 |
| Higher education (Reference: No) | 1 | |
| Yes | 4.90 [0.60-39.97] | 0.138 |
| Perceived self-efficacy – GAB2 (Reference: 1st to 3rd quartile) | 1 | |
| > 4th quartile | 3.09 [1.67-5.71] | 0.000 |
| Perceived collective efficacy – GAB2 (Reference: 1st to 3rd quartile) | 1 | |
| > 4th quartile | 0.92 [0.49-1.70] | 0.792 |
| | ORa [IC95%] | *P* |
| Nutritionist (Reference: not being a nutritionist) | 1 | |
| Being a nutritionist | 5.30 [2.35-11.93] | 0.000 |
| Higher education (Reference: No) | 1 | |
| Yes | 1.27 [0.14-11.93] | 0.827 |
| Perceived self-efficacy- GAB2 (Reference: 1st to 3rd quartile) | 1 | |
| > 4th quartile | 1.86 [0.96-3.61] | 0.064 |

**Table 4.** Odds ratio *(OR)* and adjusted odds ratio (ORa) with respective confidence intervals and *p* value for the 75th percentile or over as obtained for GAB2 (self-efficacy and collective efficacy) according to the variables of interest, 2017.

| GAB2 – Perceived self-efficacy | OR [CI 95%] | *P* |
|---|---|---|
| Nutritionist (Reference: not being a nutritionist) | 1 | |
| Being a nutritionist | 8.75 [3.55-21.55] | 0.000 |
| Age (Reference: < 25 years) | 1 | |
| 25 to 34 years | 1.24 [0.12-12.63] | 0.853 |
| 35 to 44 years | 1.15 [0.11-11.73] | 0.901 |
| 45 to 54 years | 1.11 [0.10-11.96] | 0.931 |
| > 55 years | 4.80 [0.38-59.89] | 0.223 |
| Sex (Reference: Female) | 1 | |
| Male | 0.63 [0.20-2.02] | 0.447 |
| Time of experience in Primary Health Care (Reference: <5 years) | 1 | |
| > 5 years | 1.18 [0.63-2.23] | 0.589 |
| Experience in the Family Health Support Nucleus (Reference: No) | 1 | |
| Yes | 1.68 [0.92-3.08] | 0.089 |
| Higher education (Reference: No) | 1 | |
| Yes | 3.59 [0.43-29.36] | 0.233 |
| Perceived collective efficacy - GAB2 (Reference: 1st to 3rd quartile) | 1 | |
| > 4th quartile | 1.74 [0.93-3.27] | 0.081 |
| GAB2 – Perceived self-efficacy | ORa [CI 95%] | *P* |
| Nutrionist (Reference: not being a nutritionist) | 1 | |
| Being a nutritionist | 7.02 [2.72-18.07] | 0.000 |
| Experience in the Family Health Support Nucleus (Reference: No) | 1 | |
| Yes | 1.33 [0.68-2.58] | 0.398 |
| Knowledge - GAB1 (Reference: 1st to 3rd quartile) | 1 | |
| > 4th quartile | 1.98 [1.01-3.89] | 0.045 |
| Perceived collective efficacy - GAB2 (Reference: 1st to 3rd quartile) | 1 | |
| > 4th quartile | 2.00 [0.99-4.03] | 0.053 |
| GAB2 – Perceived collective efficacy | OR [CI 95%] | *P* |
| Nutritionist (Reference: not being a nutritionist) | 1 | |
| Being a nutritionist | 0.95 [0.51-1.76] | 0.886 |





**Table 4.** Odds ratio *(OR)* and adjusted odds ratio (ORa) with respective confidence intervals and *p* value for the 75th percentile or over as obtained for GAB2 (self-efficacy and collective efficacy) according to the variables of interest, 2017. (cont.)

| GAB2 – Perceived collective efficacy | OR [CI 95%] | *P* |
|---|---|---|
| Age (Reference: < 25 years) | 1 | |
| 25 to 34 years | 1.16 [0.11-11.85] | 0.896 |
| 35 to 44 years | 1.64 [0.16-16.58] | 0.672 |
| 45 to 54 years | 0.82 [0.07-9.07] | 0.877 |
| > 55 years | 1.33 [0.10-17.09] | 0.825 |
| Sex (Reference: Female) | 1 | |
| Male | 0.90 [0.30-2.65] | 0.855 |
| Time of experience in Primary Health Care (Reference: <5 years) | 1 | |
| > 5 years | 0.76 [0.41-1.42] | 0.401 |
| Experience in the Family Health Support Nucleus (Reference: No) | 1 | |
| Yes | 1.75 [0.95-3.21] | 0.068 |
| Higher education (Reference: No) | 1 | |
| Yes | 0.83 [0.20-3.45] | 0.806 |
| GAB2 – Perceived collective efficacy | ORa [CI 95%] | *P* |
| Experience in the Family Health Support Nucleus (Reference: No) | 1 | |
| Yes | 1.66 [0.90-3.07] | 0.101 |
| Perceived self-efficacy- GAB2 (Reference: 1st to 3rd quartile) | 1 | |
| > 4th quartile | 1.65 [0.87-3.11] | 0.122 |

high perceived self-efficacy, with sevenfold more chances of nutritionists being above the 75th percentile for self-efficacy in GAB2, when compared with other PHC professionals.

The results of this study suggest that nutritionists were the professionals who most accessed the recommendations and guidelines of this publication, either autonomously or through professional training designed to the qualification of healthy eating promotion actions.

Although the Brazilian Dietary Guidelines has been published in 2014 as a support tool to health educational intervention for all health professionals, food and nutrition care has often been viewed in this country as the nutritionist' exclusive responsibility and not to be shared with other members of the health care team.[17,18] The findings of the present study thus

may reflect how much the actions of food and nutrition education (FNE) have been historically established in the country as a nutritionist's exclusive field of practice. This conception has disseminated fragmented interventions that do not meet the demands of the population and the health care system.[17] According to Cervato-Mancuso et al.,[19] the ***Marco de Referência de Educação Alimentar e Nutricional para as Políticas Públicas*** (Food and Nutrition Education Reference Framework for Public Policies) brought new views and approaches for FNE practices and highlighted the importance of non-nutritionist professionals to plan and execute such actions. Six years after the publication of the FNE's Framework, the present study suggests that the recommendations of the Dietary Guidelines have been more accessed and valued by nutritionists.

According to FAO,[4] most of the countries have plans for implementation of dietary guidelines that ignore integral communication strategies, and, when available, lack the political support and resources to accomplish them. We did not find studies that assessed the health professionals' skills to implement the Dietary Guidelines in FNE actions in the country or that have examined the implementation process of this document in PHC. To the best of our knowledge, this study is the first one to make this diagnosis.

A study conducted by Ashman et al.[20] observed that the self-efficacy of Australian general practitioners for the treatment of obesity was affected by the previous practices and experiences of these professionals as well as by their perceptions of knowledge and skills. Knowledge and skills developed during the professional life have been recognized as factors on which professionals exercise more control to modify the experienced contexts. Bandura's SCT accounts knowledge as a key premise for more self-efficacy towards the achievement of the goals set by individuals.[14] With more stocks of knowledge, people have reasons to move forward to the desired goals. These, in turn, will be more robust as individuals strengthen their self-efficacy beliefs and find ways to deal with and overcome any obstacle encountered along the way.

Thus, the findings of this study point to the urgent need for planning and implementing broader and more effective processes of continuing education designed to the application of the Dietary Guidelines with all health professionals responsible for the healthy eating promotion and organization of nutrition care in SUS, with PHC as the coordinator of the Health Care Network (HCN). HCNs consist of a system that seeks to deepen and establish interrelationships, expanding the learning capacity, knowledge dissemination and use of existing information to generate new knowledge.[21] Therefore, to investigate how health professionals linked to these networks have implemented the recommendations of the Dietary Guidelines becomes fundamental as a diagnosis of public policies of continuing education in healthy eating.





Silva et al. discussed in their study the paradigm of healthy eating chosen by health professionals working in PHC.[22] This publication highlighted the need for a shift in the paradigm of the biomedical approach, centered on disease and nutrients, to a more comprehensive view of the individual. The authors presented as the challenge of the millennium the demand for health professionals capable of associating knowledge and practices that potentialize their role as agents of collective health promotion to ensure that individuals are viewed in their totality. In this regard, one of the commitments undertaken by Brazil for the United Nations Decade of Action on Nutrition (2016-2025)[3] was to promote universal access to adequate and healthy foods, with priority for families and persons experiencing food and nutrition insecurity, peoples and traditional communities and other socially vulnerable groups.

Implementation of the recommendations of the Dietary Guidelines is cited as a strategy for this commitment to be accomplished since it fosters consumption of regional foods and sustainable production practices that respect biodiversity.[3]

Although no explanatory variable was found to be determinant of collective efficacy of health professionals in the application of the Dietary Guidelines, it was expected to find Family Health Support Nucleus as a key determinant of high perceived collective efficacy. Nutritionists working in Family Health Support Nucleus tend to assume a model designed to multidisciplinary care, with a focus on team work to promote health and treating individuals in their entirety.[17-19]

It is worth noting, in this study, that the high perceived nutritionists' self-efficacy in applying the Dietary Guidelines did not affect the collective efficacy of the other professionals, which proves that belief in collective efficacy is not simply a result of the sum of individual perceptions of efficacy but a group's property. According to Bandura,[23] the achievements of a group are ultimately a product not only from the skills and knowledge that their members share but also from their interactive, coordinated and synergistic actions. Such interactions make that people achieve many of their goals only with interdependent efforts.

Campos, in 2000, already announced the significant weakening of Public Health as a specialty and the lack of control of the quality of professionals authorized to perform activities in collective health.[24] This author highlighted the importance of combining two approaches to overcome this problem: to socialize knowledge and practices and ensure specialists capable of producing more sophisticated knowledge in Public Health to intervene in complex situations. According to Campos,[24] all health professions should include in their education and training elements of collective health so that the mission of this field could be achieved: transforming knowledge and practices to modify the model of care and the functioning logic of health care services.

This study thus suggests that the logic of team work, interdisciplinary and of matrix support may not be met in PHC for accomplishment of FNE actions based on the Dietary Guidelines. Researchers have drawn attention to failures in the training of health professionals for an interprofessional collaborative practice in order to meet the populations' ever growing and more complex health demands.[25-27]

SCT considers that the beliefs that individuals share in collective efficacy to achieve a change plays a key role in public policies for health promotion and disease prevention, considering that individuals do not act alone.[14] Bandura describes that many of the individual challenges and difficulties reflect problems experienced by a group, requiring collective support to surmount them, considering that people do not live socially alone.[28] This strengthens the sense that self-efficacy is not disconnected from perceived collective efficacy and how much collective efficacy is impregnated with self-efficacy. After all, individuals with good perceived collective efficacy mobilize efforts and resources to surmount obstacles from the external environment and achieve what they want. On the other hand, those who are convinced of their inefficacy give up trying even when changes can be attained with collective efforts.

In this context of professionals' qualification, nutritionists should act as a matrix agent of Family Health Strategy teams, aiming to potentialize food and nutrition actions and help other team's health professionals to overcome the difficulties that they have to cope with when implementing the Dietary Guidelines. The nutritionist contributes to the definition of an integrated agenda of organization of nutrition care based on the needs of the teams and communities in the areas that they operate.[18] In this study, it became clear the Family Health Support Nucleus incapacity to overcome the fragmented health logic, disconnected from the principles of interdisciplinary and inter-sectorial action, which are necessary to consolidate effective healthy eating promotion actions and ensure the quality of nutrition care in PHC. Such obstacle seems possible to be surmounted by permanent education actions that consider matrix support and PHC interdisciplinarity for the effective implementation of the recommendations and paradigm of healthy eating as defined in the Dietary Guidelines.

Permanent health education promotes the professional self-valuation and valuation from other health professionals and the population, minimizing the effects of the biomedical model.[29] The predominance of such curative and hospital-centered model contributes to posit the healthy eating promotion strategies in the SUS in a secondary level.[30] As a consequence, difficulties in adopting healthy eating habits have already been reported by PHC users, showing the need to implement more effective actions in this context.[15]





Thus, the present study emphasizes the urgency for more effective processes of training of health professionals working in PHC to implement the Dietary Guidelines, so that the nutritionist can be consolidated as a technical reference for the other members of the health care teams to plan and execute healthy eating promotion actions.

Although this study was conducted with health professionals working in all macro-regions of this country, it should be noted that we used a convenience sample, which makes it impossible to extrapolate the results to the universe of health professionals in PHC in Brazil. Nevertheless, the findings of this study are an unprecedented description of the skills and knowledge of this population to implement the Dietary Guidelines published in 2014 by the Ministry of Health.

## CONCLUSIONS

The present study concluded that being a nutritionist is associated not only with having more knowledge of the recommendations of the Dietary Guidelines as well as more self-efficacy in applying them. However, the collective efficacy to apply the Dietary Guidelines was not associated with the profession.

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**Contributors**

Reis LC conducted data collection, analyzed and interpreted the results and wrote the manuscript. Jaime PC designed the study, interpreted the results and revised the manuscript. Both authors read and approved the final version of the manuscript. This research integrates the doctoral project of LCR (Programa de Pós-graduação em Nutrição em Saúde Pública, Faculdade de Saúde Pública da Universidade de São Paulo – FSP/USP).

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