








-  Gabriela Gomes de Paiva
-  Daniele Cristina de Almeida¹
-  Letícia Clara Coelho¹
-  Simone Cardoso Lisboa Pereira¹
-  Bruna Vieira de Lima Costa¹

¹ Universidade Federal de Minas Gerais^{ROR}. Escola de Enfermagem. Departamento de Nutrição. Belo Horizonte. Minas Gerais. Brasil.

Correspondence

Bruna Vieira de Lima Costa
brunavlcosta@gmail.com

Assistant Editor

 Cristiano José de Andrade

Competencies developed by students while working in nutrition junior enterprises

Competências desenvolvidas por estudantes durante atuação nas empresas juniores de nutrição

Abstract

Introduction: Reflections arise on how junior companies have been structuring themselves alongside the teaching dynamics in Brazilian universities and their effective contributions to the professional training and development of skills of their members. Thus, this study aimed to identify competencies perceived by students in nutrition junior enterprises in Brazil and compare them according to their profile (time of participation, number of positions and weekly workload). **Methods:** Cross-sectional study, carried out with a representative sample of students working in nutrition junior enterprises. Self-reported variables were collected on sociodemographic, occupational, technical-scientific performance data, aptitude for entering the job market, intention of professional activity and perception of the skills developed. Pearson's Chi-square test or Fisher's exact test was used to determine differences in the perception of acquired skills between the performance profiles. **Results:** Participation in junior enterprises influenced the development of various entrepreneurial skills that change according to the student's performance profile in junior enterprises. The greater dedication of time and activities in junior companies provided recognition of significant skills such as leadership ($p < 0.001$), problem-solving ability ($p < 0.01$), and social responsibility ($p = 0.05$). On the other hand, only a quarter of students took courses on entrepreneurship and only two in ten were willing to become an entrepreneur after academic training. **Conclusion:** This study presents which entrepreneurial skills are most developed through participation in a junior enterprise. This research can contribute to promoting scientific data on entrepreneurship education, which is still scarce in developing countries. Furthermore, it can encourage the participation of students in junior enterprises and promote support for this activity among professors and universities.

Keywords: Nutrition. Entrepreneurial education. Practical education. Junior enterprises. Educational Innovation.

Resumo

Introdução: Surgem reflexões sobre como as empresas juniores vêm se estruturando junto à dinâmica de ensino nas universidades brasileiras e suas contribuições efetivas para a formação profissional e o desenvolvimento de competências de seus integrantes. Assim, o objetivo do estudo foi identificar competências percebidas por estudantes nas empresas juniores de nutrição do Brasil e compará-las segundo o perfil de atuação (tempo de participação, número de cargos e carga horária semanal). **Métodos:** Estudo transversal, realizado com uma amostra representativa de estudantes atuantes nas empresas juniores de nutrição. Foram coletadas variáveis autorreferidas sobre dados sociodemográficos, ocupacionais, de atuação técnico-

científico, aptidão para ingresso no mercado de trabalho, pretensão de atuação profissional e percepção das competências desenvolvidas. Foi utilizado teste Qui-quadrado de Pearson ou Exato de Fisher para determinar diferenças na percepção de competências adquiridas entre os perfis de atuação. **Resultados:** A participação em empresas juniores influenciou o desenvolvimento de diversas competências empreendedoras que mudam de acordo com o perfil de atuação do aluno nas empresas juniores. A maior dedicação de tempo e atividades nas empresas juniores proporcionou o reconhecimento de competências significativas como liderança ($p < 0,001$), capacidade de resolução de problemas ($p < 0,01$) e responsabilidade social ($p = 0,05$). Por outro lado, apenas um quarto dos alunos realizou cursos sobre empreendedorismo e apenas dois em cada dez indicaram o desejo de empreender após a formação acadêmica. **Conclusão:** Este estudo apresenta quais competências empreendedoras são mais desenvolvidas com a participação em uma empresa júnior. Esta investigação pode contribuir para a promoção de dados científicos sobre a educação para o empreendedorismo, que ainda é escassa nos países em desenvolvimento. Além disso, pode incentivar a participação de estudantes em empresas juniores e promover o apoio a esta atividade entre professores e universidades.

Palavras-chave: Nutrição. Educação empreendedora. Educação prática. Empresas juniores. Inovação em educação.

INTRODUCTION

University instruction should be guided by the expansion of the theoretical and practical training of the student, to lead him to the formation of a professional identity. As the university enlarges its role, traditional academic tasks are expanded, according to the requirements of newly emerging functions.¹ Thus, extension projects and practical experiences, such as the one provided by Junior Enterprises (JE), emerged in universities intending to adapt academic training to the demands of the labor market, expand professional qualification and competency formation, through the association of technical-scientific knowledge with practical experiences.²

Considering the concept proposed by Junior Enterprises Global Network³ and the Brazilian legal framework,⁴ JE are defined as associations constituted and managed exclusively by students who attend higher education, intending to carry out projects and services that contribute to academic and professional development, training them for the labor market. By universities, Junior Enterprises are understood as extension projects that favor dialogue between the community and the university, providing the students with a practical experience that strengthens their academic training engaged with the demands of society.⁵

Currently, there are more than 19 Confederations of Junior Enterprises in 17 countries, one of which is continental, with an annual income of around 16 million euros.⁶ Brazil has the highest concentration of JE worldwide, totaling 1,344 enterprises recognized by the Brazilian Confederation of Junior Enterprises, called Brasil Júnior. Among these, 18 exclusively cover the Nutrition course. The increased number of JE is relevant, reaching incomes above 49 million reais in 2020, from about 34,366 projects that year.⁷

The importance of JE in technical-scientific training is consolidated by higher autonomy in learning and the formation of competencies.⁸ The formation of competencies at its different levels is a frequent theme in the educational and professional spheres. It is noteworthy that knowledge, skills, and attitudes are only converted into individual competencies when used.⁹ Therefore, the development of competencies depends on a combination of knowledge, know-how, experiences, and behaviors exercised in specific contexts.¹⁰ Participation in a JE is an experience in which students can develop and contextualize a set of knowledge, overcoming the limits of a subject experienced in the classroom.^{2,10,11}

Specifically, regarding the new demands of the Nutrition professional's labor market, the expansion of their professional and social role can be observed. It is noted that the nutritionist has been taking on roles that go beyond a liberal professional in the health area, but also an organizational professional who therefore needs specific knowledge in management and new personal, managerial, and entrepreneurial competencies.^{12,13} However, there is a certain weakness in the Brazilian Curriculum Guidelines for the Nutrition Course in encouraging the development of these competencies.¹³

Given the above, reflections arise on how JE have been structuring themselves along with the teaching dynamics in Brazilian universities and their effective contributions to the professional training and development of competencies of their members. Thus, this study aims to identify the competencies perceived by the students and to compare them according to the performance profile in nutrition JE in Brazil. It is worth noting that research such as this is relevant given the scarce scientific production on the contribution of JE in the technical-scientific training of students. A few published articles essentially focus on the impact of some processes or use JE as a case study.^{14,15}

METHODS

This is an analytical, observational, cross-sectional study conducted with students working in nutrition JE in Brazil. Currently, the country has a population of around 213.3 million inhabitants,¹⁶ with a gross domestic product of R\$2.2 trillion (3rd quarter of 2021)¹⁷ and a human development index of 0,765 (IDH).¹⁸

The identification of nutrition JE in Brazil was carried out on the website of the Brazilian Confederation of Junior Enterprises (www.portal.brasiljunior.org.br) in July 2021. From the search for the terms “nutrition” and “food”, 18 nutrition JE were identified, two of which were not active.¹⁹ To take part in the study, the nutrition JE should act in the national territory, be federated, and be active.

Considering all the students who are members of nutrition JE in Brazil (n=285), a simple random sampling process was carried out, resulting in 108 participants. To calculate the sample size, the following parameters were considered: a) 95% confidence level; b) 30% response rate; c) 50% success rate estimate; d) margin of error of 7.5%; e) population size. The eligibility criteria for participation were being an active student member of any nutrition JE in Brazil and agreeing to participate in the study. Exclusion criteria were being away from the nutrition JE for more than a month and being on vacation.

The diffusion of the research took place through multiple actions such as informative text and propagation video sent by email and WhatsApp. The information provided included data from the responsible researchers, research objectives, data collection methodology, and the importance of participation.

Data was collected between August and September 2021, through a structured questionnaire, developed based on national^{20,21} and international²² studies and applied online (*Google Forms*). Questionnaires were anonymous and the participation was voluntary.

Sociodemographic variables were collected (age, gender, and period of study at the university), occupational (position, number of positions held, time of participation, and weekly workload), technical-scientific performance (satisfaction in working in the nutrition JE, skill to understand subjects related to the area of expertise of the nutrition JE, course of subjects on entrepreneurship and importance of participating in the nutrition JE for training), aptitude to enter the labor market, the aim of professional performance (public tender, private companies, entrepreneurship, and academic career) and on the perception of competences acquired in the nutrition JE (autonomy, commitment, courage, creativity, critical vision, disinhibition, goal seek, leadership, meeting deadlines, oratory, organization, proactivity/initiative, problem-solving, professional ambition, project development, self-confidence, social responsibility, teamwork).

The “time of participation in the nutrition JE” was categorized in less than six months and six months or more, as it represents the common periodicity for the selection of new members and change of management in the JE.^{20,21} The variable “number of positions” was categorized into one position and more than one position, because of the perspective that the occupation of more than one position is related to the performance of different activities, making up new experiences. And the variable “weekly workload” was categorized into less than 10 hours and 10 hours or more, to correspond to the expected time of volunteer work in extension projects in several universities.²³

The competencies investigated were based on the “EntreComp conceptual models” that, together, make up some of the crucial skills for entrepreneurs.²² The competencies were presented to the interviewees, who should select, according to their perception, those developed during their work in the nutrition JE. All competencies were compared according to the students' occupation profile, investigated by the variables “participation time”, “number of positions” and “weekly workload”.

Data were tabulated in Microsoft Excel spreadsheets with double typing. Statistical analyzes were performed using Stata software, version 14.2. Descriptive analyzes were performed using absolute and relative frequencies. Pearson's Chi-square or Fisher's Exact Test was used to determine whether there was a difference in the perception of acquired competencies between the performance profiles in JE. The significance level adopted was 5% ($p < 0.05$). The study was approved by the Research Ethics Committee (Approval number: 47489421.0.0000.5149; 4.866.69). All participants agreed to the online form of participation in the study.

RESULTS

One hundred and twelve students working in the 16 active and federated nutrition JE in Brazil participated in the study. Most were female (89.3%), more than half were between 21 and 24 years old (52.7%), and most of the interviewees were in intermediate periods of graduation (47.7%) (Table I).

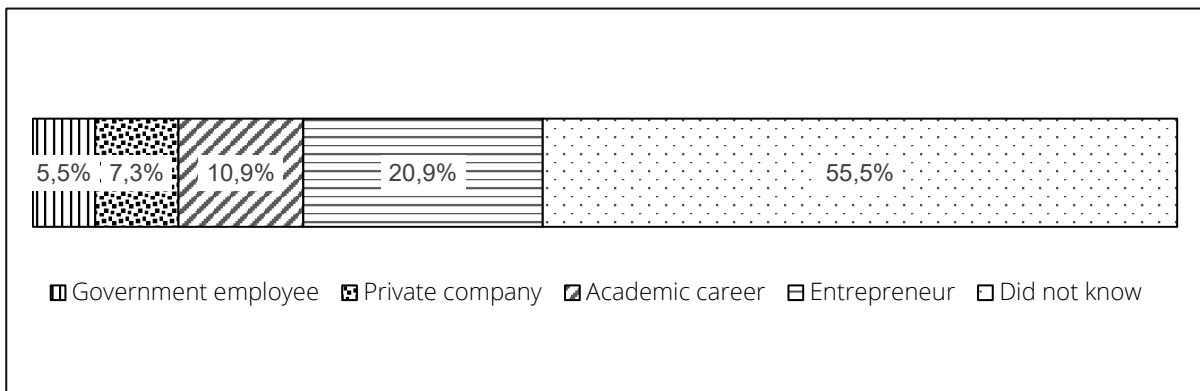
Table 1. Sociodemographic and occupational characteristics of students working in nutrition junior enterprises in Brazil, 2021

Variables	Absolute Frequency (n)	Relative Frequency (%)
<i>Sociodemographic</i>		
Gender		
Female	100	89.3
Male	12	10.7
Age (in years)		
16-20	49	43.8
21-24	59	52.7
25-28	4	3.6
Period in Study at the University		
1st to 3rd	41	37.6
4th to 6th	52	47.7
7th to 9th	16	14.7
<i>Occupation at Junior Enterprise of Nutrition</i>		
Position		
Federated positions	3	2.8
Counselor	6	5.6
President	12	11.2
Director	26	24.3
Manager	32	29.9
Consultant	18	16.8
Advisor	15	14.0
Trainee	4	3.7
Number of Positions Held		
1	44	40.0
>1	66	60.0
Time of Participation (in months)		
< 6	44	39.3
≥ 6	68	60.7
Weekly workload		
<10	60	56.1
≥ 10	47	43.9

Source: Authors

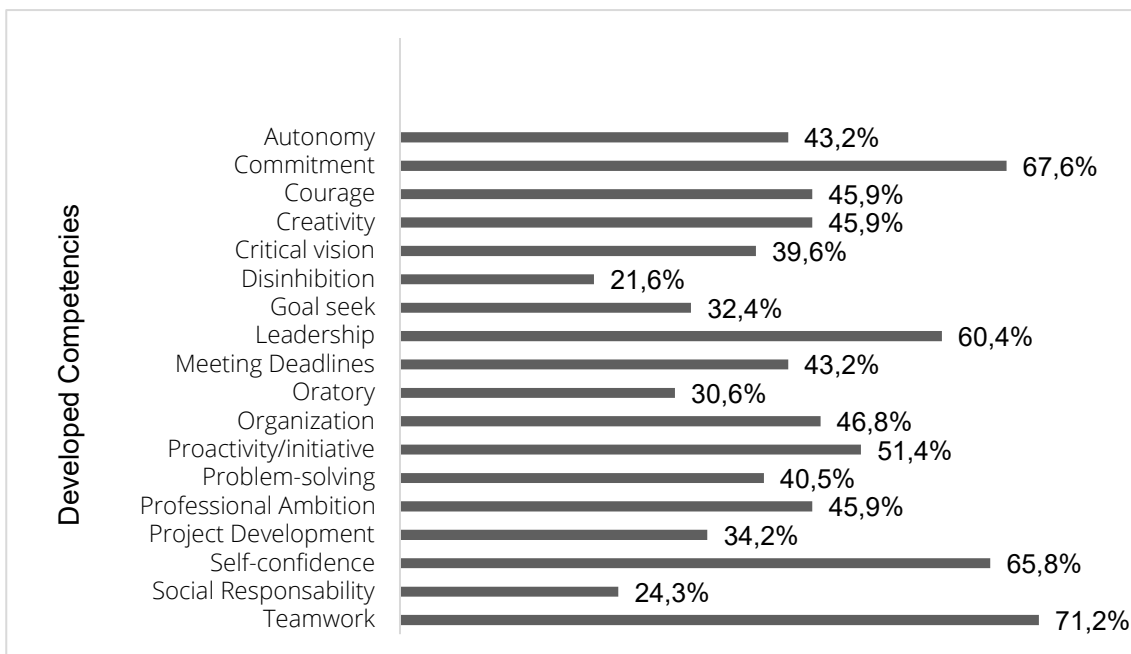
Regarding performance related to academic training, most respondents reported met expectations (99.1%), considered participation in nutrition JE important for training (99.1%), and reported facility to understand the content of related disciplines to activities developed in JE (99.0%); however, only 25.9% reported the course of entrepreneurship subject in university (data not shown). Most interviewees declared they were able to enter the job market (71.4%), although more than half (55.5%) still did not know their intention of professional activity after graduation (Figure 1).

Figure 1. Intention of professional performance of students working in nutrition junior enterprises in Brazil, 2021.



The entrepreneurial competencies developed while working in nutrition JE are presented in Graph 1, and the five most cited were: teamwork (71.2%), commitment (67.6%), self-confidence (65.8%), leadership (60.4%), proactivity/initiative (51.4%) (Figure 2).

Figure 2. Competencies developed by students during their work in nutrition junior enterprises in Brazil, 2021.



The comparison of the competencies developed according to the occupation profile investigated by the variables “participation time”, “number of positions” and “weekly workload” is presented in Table 2. Regarding the participation time, those students who had worked for six months or more in the nutrition JE

reported more significant proportion of disinhibition (27.9% vs. 11.6%; $p=0.042$), leadership (73, 5% vs. 39.5%; $p=0.000$), ability to develop projects (44.1% vs. 18.6%; $p=0.006$) and problem-solving (48.5% vs. 27.9 %; $p=0.031$) when compared to students with less than six months of experience at nutrition JE. As for the number of positions, respondents who worked in more than one position in the nutrition JE reported more significant proportion of leadership competencies (72.7% vs. 44.2%; $p=0.003$), social responsibility (30.3 % vs. 14.0%; $p=0.050$) and problem-solving ability (51.5% vs. 25.6%; $p=0.007$), when compared to those who worked in only one position. On the other hand, students who worked in only one place more frequently reported meeting deadlines (55.8% vs. 34.9%; $p=0.031$). Regarding the weekly workload, it was observed that students who dedicated ten or more hours to the nutrition JE reported more the development of oratory (44.7% vs. 20.3%; $p=0.007$) when compared to those who spent less time per week (<10 hours). Students who dedicated less than ten hours per week showed more significant proportion of organizational competency (57.6% vs. 34.0%; $p=0.016$) (Table 2).

Table 2. Competencies perceived by students according to occupation profile in nutrition junior enterprises in Brazil, 2021

Developed Competencies	Time of Participation (n=111)			Number of Positions Held (n=110)			Weekly Workload (n=107)		
	< 6 months	≥ 6 months	p-value	1 position	>1 position	p-value	<10h	≥10h	p-value
	%	%		%	%		%	%	
Autonomy	34.9	48.5	0.157	37.2	48.5	0.246	40.7	42.6	0.846
Commitment	65.1	69.1	0.661	65.1	69.7	0.617	61.0	74.5	0.143
Courage	55.8	39.7	0.097	55.8	39.4	0.093	49.2	40.4	0.370
Creativity	51.1	42.7	0.380	44.2	45.5	0.896	44.1	46.8	0.778
Critical Vision	35.6	44.1	0.225	32.6	43.9	0.235	32.2	46.8	0.125
Disinhibition	11.6	27.9	0.042	14.0	27.3	0.101	20.3	23.4	0.704
Goal Seek	41.9	26.5	0.092	30.2	33.3	0.735	33.9	29.8	0.652
Leadership	39.5	73.5	0.000	44.2	72.7	0.003	52.5	68.1	0.105
Meeting Deadlines	53.5	36.8	0.083	55.8	34.9	0.031	50.9	34.0	0.083
Oratory	25.6	33.8	0.359	27.9	31.8	0.664	20.3	44.7	0.007
Organization	51.6	44.1	0.469	53.5	43.9	0.329	57.6	34.0	0.016
Proactivity/initiative	51.1	51.5	0.975	55.7	50.0	0.553	47.5	57.6	0.307
Problem-solving	27.9	48.5	0.031	25.6	51.5	0.007	33.9	48.9	0.117
Professional Ambition	53.5	41.2	0.205	55.2	42.4	0.371	42.4	51.1	0.373
Project Development	18.6	44.1	0.006	25.6	40.9	0.101	28.8	40.4	0.210
Self-confidence	60.5	69.1	0.349	62.8	66.7	0.678	61.0	70.2	0.324
Social Responsibility	23.3	25.0	0.835	14.0	30.3	0.050	23.7	25.5	0.830
Teamwork	65.1	75.0	0.263	67.4	72.7	0.554	67.8	72.3	0.613

Variables with a significance level $\leq 5\%$ are in bold.

Source: Authors

DISCUSSION

The results showed several competencies developed during the performance in the nutrition JE; the main ones are teamwork, commitment, self-confidence, leadership, and proactivity/initiative. The study also revealed that students with more weekly dedication, occupying more positions, and working more extended periods reported more the development of disinhibition, leadership, problem-solving, and project development competencies, in addition to social responsibility, and oratory. On the other hand, those

students who had less participation reported greater proportion of organizational skills and meeting deadlines. The satisfaction in participating in the nutrition JE and the facility to understand the content of related subjects were noteworthy. On the other hand, only a quarter of the students took courses on entrepreneurship and only two out of ten indicated the desire to undertake after academic formation.

The importance of JE in academic training to approach the business environment and increase the ability to enter the job market has been discussed in the literature.^{2,14,24} JE are "action" programs; that is, programs to encourage learning based on problems and projects, a characteristic of learning-by-doing education.²⁵ The demand for professionals with competencies that could be developed while working in a nutrition JE is already pointed out in the Brazilian Curriculum Guidelines for the Nutrition Course, established in Resolution No. 5 of November 7, 2011: "professionals must be able to take initiatives, manage and administer both the workforce, physical and material resources, and information, in the same way, that they must be able to be entrepreneurs, managers, employers or leaders in the health team".²⁶

On the other hand, this is the only passage in the Brazilian Curricular Guidelines that sharpens the entrepreneurial spirit. It is worth noting that the literature indicates gaps in nutritionist formation concerning the competencies improvement, such as the absence of disciplines and activities related to leadership development, decision making, administration, management, and entrepreneurship.¹³ It seems then that the appointment of competencies, skills and curricular contents adopted in the Brazilian Curriculum Guidelines for the Nutrition Course still do not follow the technical and scientific development of the country and do not fully meet the demands of the labor market and Brazilian society. Thus, the presence of JE in universities becomes fundamental and even more relevant, to carry out projects and services that contribute to the academic and professional development of students (training them for the job market), as well as for the socioeconomic development of a region.²⁷

Accordingly, it is observed that professional formation in Brazil is still focused on traditional education, directing students to obtain jobs in the public or private sector and, generally, neglecting entrepreneurship, considered a risky activity and distant from the reality of students.²⁸ Therefore, it is not surprising that few students reported the study of subjects about entrepreneurship, which is also corroborated by the literature, where less than a third of courses in the health area in Brazil offer disciplines on this theme.²⁹ It is expected that the course of entrepreneurship subjects will enable students to establish relationships and possibilities to undertaking business, recognizing themselves as citizens of law, with opportunities to align their life and career plan with their business plan.²⁹

Additionally, more than half of the students had not defined their professional activity intention after graduation, which can be justified by the majority still attending intermediate periods, not having sufficient knowledge and experience in the areas of professional activity in Nutrition. Generally, practical activities are experienced only in the last periods, which can be corrected by working in the JE, which can provide theoretical-practical experience from the initial periods of the course, solving one of the weaknesses in the theoretical-practical relationship of universities, regarding the problem of linearity of the teaching process.²⁷

There is a new configuration of the nutritionist's job market, which requires an organizational professional, with specific knowledge in the management area and endowed with managerial and entrepreneurial competencies.¹² It is noteworthy that the nutritionist's formation should make them capable of working in several areas, such as entrepreneurship and business, requiring competencies that go beyond the exclusively technical domain.¹³ Students working in nutrition JE's in Brazil receive technical, academic, personal, and professional improvement capable of complementing their formation and to correspond the training expectations of a generalist, humanist and critical professional.⁵

The experience provided to students in nutrition JE corresponds not only to the practical application of theoretical knowledge but also to the development of competencies.²⁴ These JE propose an entrepreneurial education based on a series of pedagogical measures: not excessive theoretical workload, autonomous learning, based on action and the direct participation of students, allowing learning based on experience and facilitating cooperative and interactive learning.³⁰ The competencies most reported by students (teamwork, commitment, self-confidence, leadership, and proactivity/initiative) corresponded to the contributions of acting in JE for academics from different areas of knowledge.^{2,9-12,14,22,24}

It should be noted that competencies are defined as knowing how to act, which requires mobilizing, integrating, and transferring knowledge, resources, and skills, in a professional context,¹⁰ adding economic value to the organization and social value to the individual,⁹ which reinforces the role of JE in universities.

The higher dedication in time and activities allowed for recognizing outstanding skills (disinhibition, leadership, problem-solving, and development projects, social responsibility, and oratory) for nutritionist training, who should be able to think critically, analyze social problems, and seek solutions.²⁶ Those students who spent less time could perceive equally relevant competencies (organization and meeting deadlines), often not observed by those who present greater demands for time and activity.

As study limitation, we can mention the application of the questionnaire remotely (online), which can be a source of bias due to the interviewee's interpretation of the questions. However, conducting online surveys is a strategy used in national surveys in countries with large territorial dimensions, as it allows access to a representative sample of the target sample, especially in times of social isolation.³¹ It is noteworthy that the research was carried out during the Covid-19 pandemic, caused by the SARS-CoV-2 coronavirus. In addition, online data collection brings lower operating cost, as well as more agility in obtaining and disseminating information.³²

It is believed that this research can contribute to the promotion of scientific data on entrepreneurship education - especially in the Nutrition course, which is still scarce in the scientific literature - with a view to the performance of nutrition JE in Brazil, promoting the understanding of sociodemographic characteristics, occupational profile, and perception of developed competencies. It is worth noting that one must transpose formal entrepreneurial education, with a focus on a lot of theoretical content, which often makes students very analytical, excessively aware of problems, and averse to risks,³³ to allow them autonomous learning, based on action and experience, such as that provided by JE.

CONCLUSION

The experience of the students in nutrition junior enterprises provided the development of several competencies that changed according to the profile of the students' activity in JE. The higher dedication in time and activities in the JE provided the acknowledgment of meaningful competencies such as leadership, problem-solving skills, and social responsibility. Students who had less time for dedication and activities in JE could also develop meaningful competencies, such as organization and meeting deadlines. It is believed that the understanding of the adequate contributions of JE to the professional formation and development of students' competencies can contribute to entrepreneurial education, consistent with the reality of enterprises and capable of transforming society. Furthermore, the results of the study can stimulate the participation of students in JE, as well as promote support for JE among teachers and in higher education institutions.

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Contributors

Paiva GG participated in the analysis and interpretation of the data, in the writing and final revision of the manuscript; Almeida DC and Coelho LC participated in data collection, data analysis and interpretation, and writing of the manuscript; Costa BVL participated in the conception and design of the study, interpretation of the data, writing and final revision of the manuscript; Pereira SCL participated in the final revision of the manuscript.

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