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ARTICLES

Program and system dropout in collective health undergraduate education [1] [2] [3]

Evasão de curso e do sistema na graduação de saúde coletiva

Deserción de la carrera y del sistema en la licenciatura en salud colectiva

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Abstract

This research aimed to understand dropout causes in the collective health program at the University of Brasília, Ceilândia campus. Data were collected by using a questionnaire applied to dropout and enrolled students from the program, reaching a sample of 147 respondents. Results were analyzed by multinomial logistic regression, identifying the causes that lead students to change programs or leave higher education. Dropout causes were associated with individual, family, and institutional issues, occurring differently in program and higher education dropouts. Results corroborate that program and system dropout are distinct phenomena that are influenced in different manners by the same or different variables.
Keywords: university dropout, university management, university policy.

Resumo

Esta investigação buscou entender as causas da evasão no curso de Saúde Coletiva da Universidade de Brasília, no campus de Ceilândia. A coleta de dados foi efetuada por meio de questionário aplicado aos estudantes evadidos e não evadidos do curso, alcançando uma amostra de 147 respondentes. A análise dos resultados ocorreu pela regressão logística multinomial, identificando as causas que levam o estudante a mudar de curso ou deixar o ensino superior. As causas da evasão estiveram associadas com questões individuais, familiares e institucionais, porém se manifestando de forma diversa na evasão do curso e do ensino superior. Os resultados corroboram que esses fenômenos são distintos e influenciados de forma variada, pelas mesmas ou por diferentes variáveis.
Palavras-chave: *evasão universitária, gestão universitária, política universitária.*

Resumen

Esta investigación buscó comprender las causas de la deserción de la carrera en Salud Colectiva de la Universidad de Brasilia en el campus *de Ceilândia (Brasil). Para la recolección de datos se aplicó un cuestionario a los estudiantes que abandonaron y que no abandonaron la carrera, quienes compusieron la muestra de 147 encuestados. Los resultados se analizaron mediante regresión logística multinomial que identificó las causas que llevaron a los estudiantes a cambiar de carrera o abandonar la educación superior. Las causas de la deserción se asociaron a cuestiones individuales, familiares e institucionales, sin embargo, se manifestaron de manera diferente en la deserción de la carrera y de la educación superior. Los resultados coincidieron que estos son fenómenos distintos e influenciados de diferente manera por las mismas o diferentes variables.*
Palabras clave: *desersión universitaria, gestión universitaria, política universitaria.*

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Introduction

The University of Brasília (UnB) and the Federal University of Acre (UFAC) were the pioneers in offering the undergraduate program in Collective Health, which, until then, was restricted to graduate and specialization programs, training the traditional Sanitarian. This new undergraduate program presents a generalist training with content in the fields of Exact, Social, Biological and Health sciences, with the intention of training professionals to work in the planning, management, execution and evaluation of health care actions in the collective scope, rather than individual care. According to Bosi and Paim (2010, p. 2036), the main controversy concerning this new undergraduate program "is how much strictly biological training this program must bear," and its main challenge consists in the "theory-practice articulation," capable of predicting situations that lead students to learn to think.

In Brazil, undergraduate programs in Collective Health expanded from 2008, driven by the Program to Support Restructuring and Expansion Plans for Federal Universities (REUNI) (Bosi & Paim, 2010). During the REUNI period, the offer of places in public higher education in Brazil doubled, with a significant democratization in access to public universities. However, criticism has been directed to the quality and to the unplanned offer of programs after REUNI, showing a concern with the inclusion of graduates in the labor market and with the increase in university dropout rates (Almeida et al., 2020).

Higher education dropout is an observable fact both in the national and the international contexts. Castro and Teixeira (2013, p. 10) noted that "in the international context, the concern with the subject dates some decades old, while in Brazil the emphasis on the theme is more recent." According to Baggi and Lopes (2011, p. 356), dropout "is an issue that has been worrying educational institutions in general, whether public or private, because student dropout causes serious social, academic and economic consequences."

According to Silva and Mariano (2021, p. 6), "in Brazil there is a significant diversity of conceptions of dropout," and the various concepts can be summarized into three large groups: a) those that analyze dropout through three dimensions (program dropout, institution dropout, and system dropout); b) those that start from the analysis of the student's trajectory to examine the dropout issue; and c) those that view dropout as a public problem only when there are excluding factors that are independent of the student's will and that imply the total exit of the student from higher education, disregarding mobility, for example. Still based on the author, the

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successes of public action and diagnostic tools depend, among other things, on an adequate definition of the phenomenon to be faced.

According to the Brazilian Ministry of Education (MEC), dropout occurs when it represents a condition of impairment in student training. Therefore, the MEC considers that the consequences of dropout for a particular program and academic institution are not important to define the phenomenon.

Dropout: early exit, before the end of the year, grade or cycle, due to opting-out (regardless of the reason), thus representing a final condition of failure in relation to the objective of promoting the student to a condition higher than that of entry, with regard to the expansion of knowledge, cognitive development, skills and competencies desired for the corresponding educational level (INEP, 2017, p. 9).

In the classic work of Tinto and Cullen (1973, p. 1), the concept of dropout should consider its consequences for students and also for their program and institution of enrolment, and should be classified into two types of definitions: "1) abandonment as referring to people who leave the school in which they are enrolled; and 2) dropout as referring only to those people who have never received a degree from any higher education institution."

Dropout is often an element ignored by universities, and in some cases, its causes have been attributed only to students. Contrary to this superficial explanation, it is important to observe dropout as a problem of the institution and that, directly and indirectly, can affect everyone, since the waste of financial and human resources in education impacts the development of the country as a whole (Bardagi & Hutz, 2009).

Given the above, it is observed that dropout is a complex phenomenon with several causes, not limited to personal factors of students. Bernardo et al. (2016) said that, although the phenomenon has already been studied in recent research, the amplified knowledge of the context in which it occurs is fundamental for taking corrective measures. Thus, through institutional practices, there are important implications that can contribute to reduce student dropout (Chen, 2012). Therefore, knowing the specifics of the program and the reasons that lead to dropout can be important elements in the search for possible solutions.

According to Silva (2013), most studies addressing dropout in specific cases are limited by the methodology used, i.e., their results cannot be generalized and requires analyses that

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consider the specificities of each program, as is the case of this research for the undergraduate program in Public Health at Faculdade UnB de Ceilândia (FCE). Silva (2013, p. 313) states that "the current literature lacks effective means to compare the profile of dropout students, since it is focused on the peculiarities of the institution and of the students who seek a certain institution."

In addition, this work is justified by the high dropout and/or retention rate of the FCE Collective Health program, suggested by its low Graduation Success Rate (GSR). The GSR is obtained by the ratio between the number of graduates and the number of entrants, adjusted by the year in which these students entered the institution. The GSR calculated by the MEC for all Federal Higher Education Institutions (FHEIs) in Brazil was 44% in 2018, double the value calculated for the FCE Collective Health program in the same year (22%). In 2019, the GSR for the FCE Collective Health program was 24% (MEC, 2019; UnB, 2020).

Considering the importance of studies that address the issue of dropout in recent and little analyzed programs, as well as the low values in the GSR indicator, and the difficulty of diagnosing dropout, given the complexity of its concept, the objective of this work is to trace and analyze the causes of dropout from the FCE undergraduate program in Collective Health. What differentiates this study from most empirical research on the subject is that here we seek to analyze the causes of program dropout (program change) and system dropout (exit from higher education) in a multinomial *logit* model.

The contribution of this research is not restricted to the analyzed program, it also advances the theoretical basis of a complex phenomenon, which is university dropout. Considering the appropriate limitations and contextualization, the results can also contribute to the construction of intervention measures in other higher education programs.

Causes of dropout

The theoretical model to explain dropout in the FCE Collective Health program was developed via a systematic literature review, which makes use of the intervention instrument entitled *Knowlegde Development Process – Constructivist (Proknow-C)*, proposed by Ensslin et al. (2010).

Based on the systematic literature review, it was not possible to observe a standardization of studies in determining the causes of dropout. It was found that the studies

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are founded on several existing models and are focused on the perception of researchers in their fields of study, prioritizing certain institutional contexts or specific programs.

Most studies noted that dropout is a very complex issue for universities. Based on the bibliographic search, the causes of dropout can be summarized into three dimensions: (a) Motivational and individual; (b) Socioeconomic and family-related; and (c) Institutional and academic. Chart 1 shows the main variables used in each dimension, according to the references consulted.

Chart 1

Relation between variables and references

Parameter	Study
Individual dimension	
Age	Gaírin et al. (2014); Hovdhaugen (2015); Jia e Maloney (2015); Venegas-Muggli (2019); Bernardo et al. (2016); Li e Carroll (2019); Casanova et al. (2018); Saccaro et al. (2019).
Sex	Jia e Maloney (2015); Hovdhaugen (2015); Venegas-Muggli (2019); Bernardo et al. (2016); Gaírin et al. (2014); Li e Carroll (2019); Casanova et al. (2018); Saccaro et al. (2019).
Marital Status	Heublein (2014); Gaírin et al. (2014).
Socioeconomic and family-related dimension	
Financial status	Hovdhaugen (2015); Venegas-Muggli (2019); Heublein (2014).
Family education	Hovdhaugen (2015).
Place of residence	Hovdhaugen (2015); Bernardo et al. (2016).
Institutional and academic dimension	
Permanence aid	Jia e Maloney (2015); Saccaro et al. (2019).
Academic performance.	Li e Carroll (2019); Zając e Komendant-Brodowska (2019); Respondek et al. (2017); Mujica et al. (2019); Heublein (2014); Casanova et al. (2018); Jia e Maloney (2015); Hovdhaugen (2015); Venegas-Muggli (2019); Bernardo et al., (2016).
Means of Admission	Saccaro et al. (2019); Casanova et al. (2018).
Identification with the program	Mujica et al. (2019); Gaírin et al. (2014); Zając e Komendant-Brodoeska (2019); Iñiguez et al. (2016).
Institutional aspect	Bernardo et al. (2016); Saccaro et al. (2019).

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Methodological procedures

FCE and research data

In the second half of 2019, FCE had 2,594 students enrolled in six undergraduate programs (Nursing, Pharmacy, Physical Therapy, Speech Therapy, Collective Health, and Occupational Therapy) and 163 students in two academic graduate programs. In 2019, the Collective Health program registered 128 admissions: 46% through the Serial Assessment Program (PAS), 23% with the National High School Exam (ENEM) score, 20% through entrance exam, and 10% through other means of admission (UnB, 2020).

The data of this research were obtained with the application of an electronic questionnaire to dropout and non-dropout students from the FCE undergraduate program in Collective Health from 2015 to 2019, totaling 637 students. Before answering the questionnaire, the participants were informed about the importance of the research and the safety regarding anonymity through an informed consent form. The research was approved by the Research Ethics Committee of the School of Ceilândia (CEP/FCE) by the opinion No. 4,284,741.

The questionnaire had 11 closed-ended questions (Appendix 1). The first question sought to trace which students have already dropped out of the program, differentiating those who changed their program (program dropout) and who left higher education (system dropout). For students who reported having changed, they were asked to identify which program they change to. The content of the other questions sought to trace the causes that may lead students to change program or leave higher education, considering the theoretical framework presented in Chart 1.

The sample reached was 147 questionnaires correctly answered. The sample size reached a ratio of approximately 15 cases for each explanatory variable (causes of dropout), being, therefore, triple the minimum of 5/1 proposed by Hair Jr. (2005). Data collection was carried out from September 19 to 25, 2020, by the students' email with an access link. The questionnaire was prepared on the Google Forms platform, as it provides a dynamic, free and practical format.

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Analytical instruments

The causes of dropout in the FCE undergraduate program in Collective Health were estimated by multinomial logistic regression. It is a statistical analysis that enables predicting a qualitative dependent variable, but provides more than two possibilities of answers (categories) from a set of explanatory variables (Hair Jr. et al., 2005). Therefore, it is the appropriate technique to evaluate dropout in its different concepts. Multinomial logistic regression accommodates explanatory variables on nonmetric (nominal and ordinal) and metric (interval and ratio) scales.

Regarding the use of ordinal scales, such as those of Likert (1932), as explanatory variables in logistic regression, Fernandes et al. (2020, p. 6) is clear: "logistic regression also accommodates variables with more than two categories" and "is ideal for modeling the distribution of ordinal variables, that is, when there is an intensity structure between the categories." Corroborating Fernandes et al. (2020), Grace-Martin (2023, p. 1) says: "There are no assumptions about the distribution of the (independent) explanatory variables in any regression."

The dependent variable differentiated students into three groups: those who never left the program; those who changed their program; and those who left higher education. The explanatory variables considered 10 variables associated with the Individual, Family, and Institutional dimensions. The Institutional dimension was divided into three subdivisions: 1) Ease of admission into the program; 2) Identification with the program; and 3) Difficulty in following the program. Chart 2 shows the coding used in the data tabulation, expressing the level of measurement and enabling the interpretation of the effect of the variables.

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Chart 2

Level of measurement of the variables

Nº	Paramenter	Description
Dependent variable		
1	Student situation	Polytomous category: Never left the program (1); Changed program (2); Left higher education (3)
Explanatory variables		
Individual dimension		
2	Age	Continuous: number of years
3	Sex	Dichotomous category: Male (1); Female (2)
Family dimension		
4	Parents are participants in academic life.	Ordinal: Strongly Disagree (1); Disagree (2); Neither Agree nor Disagree (3); Agree (4); Strongly Agree (5)
5	Parents do not support undergraduate education.	Ordinal: Strongly Disagree (1); Disagree (2); Neither Agree nor Disagree (3); Agree (4); Strongly Agree (5)
Institutional dimension: Ease of admission into the program		
6	Reason for choosing the Collective Health program	Dichotomous category: Low competition for admission (1); Other (Professional valorization, Social prestige, Family influence and/or Vocation) (2)
7	Means of Admission	Dichotomous category: Entrance Exam (1); Other (2) (PAS, ENEM, SISU, among others).
Institutional Dimension: Satisfaction with the program		
8	Identification with the program	Ordinal: Strongly Disagree (1); Disagree (2); Neither Agree nor Disagree (3); Agree (4); Strongly Agree (5)
9	Empathy with faculty	Ordinal: Strongly Disagree (1); Disagree (2); Neither Agree nor Disagree (3); Agree (4); Strongly Agree (5)
Institutional dimension: Difficulty in following the program		
10	Incompatibility between study and work	Ordinal: Strongly Disagree (1); Disagree (2); Neither Agree nor Disagree (3); Agree (4); Strongly Agree (5)
11	Difficulties in the teaching-learning relation	Ordinal: Strongly Disagree (1); Disagree (2); Neither Agree nor Disagree (3); Agree (4); Strongly Agree (5)

Multinomial logistic regression uses the maximum likelihood estimation (MLE) method and does not estimate the values of the dependent variable, but rather the likelihood of occurrence of the event under study, in this case, the likelihood of the student changing program and leaving higher education. The Statistical Package for Social Sciences (SPSS) version 20 was used to estimate the model.

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The predictive capacity of the model was evaluated by the likelihood value (-2LL), comparing the -2LL value between the null model and the model with the explanatory variables. The -2LL value is expected to be statistically the lowest of the model with the explanatory variables. Pearson's test was used to assess the goodness of fit, and the interpretation of this test is that statistically nonsignificant values indicate that the predicted probabilities do not deviate from the observed probabilities. The diagnosis of fit is finalized with the evaluation of Nagelkerke's R^2, which ranges from 0 to 1, with the values closest to 1 indicating a greater capacity of the explanatory variables to predict the situation of students regarding change of program and dropout from higher education (Hair Jr. et al., 2005; Fávero & Belfiore, 2017).

The hypotheses tested are that the coefficients for all explanatory variables are nonzero, and a 5% significance level was adopted for all statistical tests. Similarly to May-Junior (2021), multicollinearity was tested using a linear model and predictors with a Variance Inflation Factor (VIF) ≥ 10 were excluded, as suggested by Gujarati (2000).

Results

Within the sample reached, approximately half the students had dropped out of the FCE Collective Health program, with 34% continuing their studies in another program, and 13% declaring they had dropped out and, as of the time of data collection, had not entered any other higher education program (Figure 1). Approximately 60% of the students who changed program remained on the UnB campus in the city of Ceilândia, on the suburbs of Brasília. The preferred program was Pharmacy, followed by Speech Therapy, Physical Therapy, Nursing and, finally, Occupational Therapy program.

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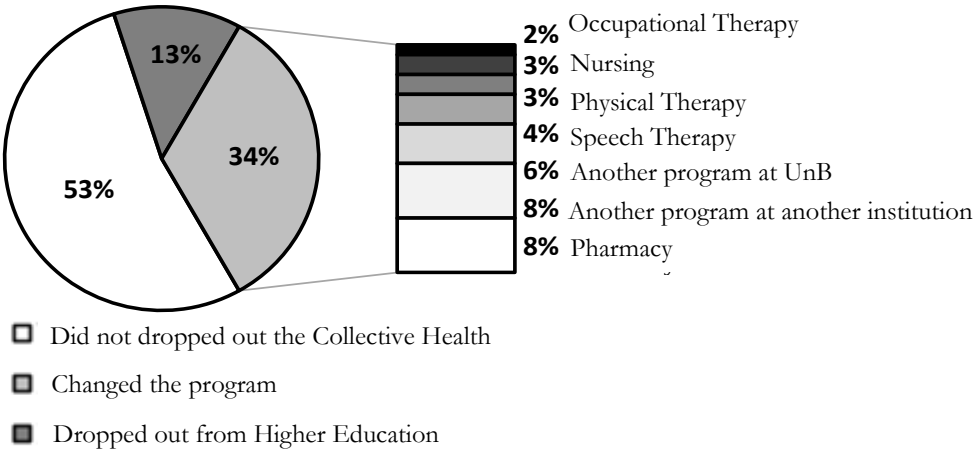
Figure 1

Decision of FCE Collective Health students between 2015 and 2019



In the null model, the likelihood value (-2LL) was 263,182, while in the model with the explanatory variables it was 162,152. This reduction in -2LL was significant at 5%, indicating that the model with the explanatory variables has a better fit than the null model. Nagelkerke's R^2 was 0.612, suggesting that the variables used explained more than half of the variance of dropout from the FCE Collective Health program. The result of Nagelkerke's R^2 value confirms the difficulty of explaining dropout with few variables.

Pearson's test was not statistically significant at 5% level, indicating goodness of fit for the model. That is, the probabilities do not deviate from the observation. The VIF value did not diagnose multicollinearity, minimizing problems of shared contribution between the explanatory variables.

Table 1 shows the parameters of the explanatory model for dropout in the FCE Collective Health program, identifying the direction and magnitude of the coefficients (β), their exact level of significance (*p-value*) and the probability of student dropout in relation to each explanatory variable (e^{β}). Based on Fernandes et al. (2020), the percentage variation in the probability of occurrence of dropout (($e^{\beta} - 1$) x 100) was calculated to facilitate the interpretation of the magnitude of the Logistic Regression coefficient. To facilitate the interpretation of the results, Table 2 presents the mean age and frequency of responses within the dimensions and groups analyzed.

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Table 1

Results of the multinomial logistic regression

Parameter	β	*p*-value	Exp(β)	(Exp(β) – 1) x 100
Those who changed program compared to those who did not leave the program				
Constant	0.388	0.865		
Age	**0.177**	**0.009**	**1.193**	**19**
Sex = 1 (Male)	0.610	0.285	1.841	84
Sex = 2 (Female)				
Parents support the academic life	**0.394**	**0.035**	**1.482**	**48**
Parents do not support undergraduate education.	0.248	0.251	1.281	28
Reason for choosing the Collective Health program = 1 (Low competition for admission)	0.785	0.171	2.191	119
Reason for choosing the Collective Health program = 2 (Other[a])				
Means of admission = 1 (Entrance Exam)	0.685	0.173	1.983	98
Means of admission = 2 (Other[b])				
Identification with the program	**−0.948**	**0.000**	**0.388**	**−61**
Empathy with faculty	**−0.745**	**0.001**	**0.475**	**−53**
Incompatibility between academic life and work	**−0.408**	**0.041**	**0.665**	**−34**
Difficulties in the teaching-learning relation	−0.374	0.080	0.688	−31
Those who left higher education compared to those who did not leave the program				
Constant	−10.776	0.013		
Age	**0.336**	**0.000**	**1.400**	**40**
Sex = 1 (Male)	**1.664**	**0.040**	**5.278**	**428**
Sex = 2 (Female)				
Parents support the academic life	0.145	0.611	1.157	16
Parents do not support undergraduate education.	0.181	0.624	1.199	20
Reason for choosing the Collective Health program = 1 (Low competition for admission)	**−3.117**	**0.006**	**0.044**	**−96**
Reason for choosing the Collective Health program = 2 (Other[a])				
Means of admission = 1 (Entrance Exam)	0.860	0.292	2.362	136
Means of admission = 2 (Other[b])				
Identification with the program	**−1.227**	**0.002**	**0.293**	**−71**
Empathy with faculty	**−0.698**	**0.028**	**0.498**	**−50**
Incompatibility between academic life and work	**1.424**	**0.021**	**4.154**	**315**
Difficulties in the teaching-learning relation	0.415	0.250	1.514	51

Note. [a] Professional valorization, Social prestige, Family influence and/or Vocation. [b] PAS, ENEM, SISU, among others. Variables in bold were statistically significant.

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Table 2

Description of the variables according to student situation

Student situation	Individual dimension			Family dimension				Institutional dimension			
								Ease of admission into the program			
	Age (mean)	Sex		Parents support the academic life		Parents do not support undergraduate education.		Reason for choosing the Collective Health program		Means of Admission	
Never left the program	22	Men	22%	SD	19%	SD	70%	Low competition for admission	60%	Entrance exam	32%
				D	19%	D	11%				
				I	20%	I	9%				
		Women	78%	A	32%	A	9%	Other[1]	40%	Other[2]	68%
				SA	10%	SA	1%				
Changed program	24	Homem	30%	SD	21%	SD	60%	Low competition for admission	82%	Entrance exam	43%
				D	15%	D	17%				
				I	13%	I	6%				
		Women	70%	A	23%	A	13%	Other[a]	18%	Other[b]	57%
				SA	28%	SA	4%				
Left higher education	28	Men	42%	SD	47%	SD	67%	Low competition for admission	37%	Entrance exam	42%
				D	5%	D	6%				
				I	16%	I	17%				
		Women	58%	A	16%	A	0%	Other[a]	63%	Other[b]	58%
				SA	16%	SA	11%				

Student situation	Institutional dimension							
	Program satisfaction				Difficulty following the program			
	Identification with the chosen program		Empathy with faculty		Incompatibility between academic life and work		Difficulties in the teaching-learning relation	
Never left the program	SD	4%	SD	9%	SD	11%	SD	25%
	D	6%	D	21%	D	7%	D	34%
	I	22%	I	31%	I	28%	I	14%
	A	46%	A	29%	A	35%	A	19%
	SA	23%	SA	10%	SA	20%	SA	8%
Changed program	SD	21%	SD	26%	SD	19%	SD	45%
	D	17%	D	36%	D	4%	D	19%
	I	21%	I	9%	I	26%	I	19%
	A	30%	A	21%	A	28%	A	13%
	SA	11%	SA	9%	SA	23%	SA	4%
Left higher education	SD	11%	SD	21%	SD	0%	SD	21%
	D	37%	D	21%	D	0%	D	16%
	I	16%	I	26%	I	22%	I	11%
	A	11%	A	32%	A	22%	A	47%
	SA	26%	SA	0%	SA	56%	SA	5%

Note. [a] Professional valorization, Social prestige, Family influence and/or Vocation. [b] PAS, ENEM, SISU, among others. Strongly disagree (SD); Disagree (D); Neither agree nor disagree (I); Agree (A); Strongly agree (SA).

Discussion of the results

The results indicated that students' age influences their decision to change program and also to leave higher education (Table 1). On average, the age of students who reported having changed their program and having left higher education was, respectively, two and four years

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higher when compared to the age of those who did not leave the Collective Health program (Table 2). The likelihood of dropping out the program and higher education is higher in older students. The order of magnitude obtained from the collected data was that the one-year increase in student's age is associated with a 19% and 40% increase in their probability of changing program and leaving higher education, respectively. As students age, they tend to be more rigorous in weighing the cost-benefit ratio of staying in the program. Furthermore, increased maturity with age can reduce indecision and increase agility in decision-making, whether to change program or to leave higher education.

Corroborating the results for the effect of age on dropout, Saccaro et al. (2019) concluded that the older the students, the lower their survival rate in higher education. Therefore, this characteristic is possibly related to the fact that the greater the age, the greater the degree of adult life activities, resulting in greater difficulties in completing undergraduate education. Silva (2013) pointed out that the opportunity cost for older students to remain in the institution is higher due to other responsibilities assumed outside the university.

Student sex affects the decision to leave higher education and has no relation to the decision to change program. The order of magnitude is that the probability of a male student leaving higher education is 5.78 times higher than the probability of a female student making the same decision. The frequency of responses within the analyzed groups facilitates understanding the results (Table 2). While the percentage of female students who did not leave or who changed program was 78% and 70% of the sample, in the group of those who declared having left higher education there was a close result between the sexes (58% for females and 42% for males). Given that female students represented 73% of the sample, the proximity in proportion within the group of those who declared having left the program suggests that male students have a predisposition to dropping out.

Being female had a strong impact on reducing the probability of leaving higher education (428% lower, according to Table 1). This result may be related to the fact that female students are usually the majority in undergraduate programs in Collective Health (Castellanos et al., 2013). Noting that the analyzed program is consistent with the finding of Castellanos et al. (2013), the majority female presence may indicate a better adaptation of this sex with the studied program, influencing its reduced dropout rate.

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In addition, female students tend to be more persistent in higher education (Saccaro et al., 2019). This understanding is in line with the Brazilian Higher Education Census, which addresses the 2010–2019 time frame (Inep, 2019). The Census presents mean indicators for the trajectory of undergraduate program entrants by sex, showing that female students have a better completion rate when compared to males: 43% against 35%. This is also reflected in the dropout rate in the entrance program, which is lower than that of males. Naturally, the explanation of the result reached for the effect of the sex variable is not exhaustive, suggesting the deepening of its impact on future research.

As for the family dimension variables, only the one that measured the parental support participation in the academic development of students impacted the decision to change program. The order of magnitude is that a one-unit increase (each point on the Likert scale) in parents' support is associated with a 48% increase in the student's likelihood to change program. No statistically significant influence on the decision to leave higher education was found at the 5% level for these variables (Table 1). The results indicate that family support has a greater influence on the student's decision to seek another professional career than in the decision to leave higher education, perhaps because issues unrelated to the student's desire have a greater weight in the decision to drop out of the system than in the decision to change program.

Part of the literature uses the parental education level as a measure of parental influence, demonstrating different effects on dropout. Higher parental education can reduce dropout due to better advice in the children's choice of program and to better support during undergraduate education. On the other hand, it can increase family income and enable a longer decision time for career choice (Sampaio et al., 2011; Hovdhagen, 2015).

The study by Ortiz and Dehon (2013) concluded that having a mother with a higher education degree has a positive influence so that the children graduate and decreases the probability of dropout. In addition, Ortiz and Dehon (2013) said that having an unemployed parent is also a significant factor for school dropout. Empirical evidence from Neres and Almeida (2022) indicated that increased parental involvement in their children's education reduces the likelihood of dropout, confirming the positive role of the family —played by parental affective ties, cohesion and support—in an individual's integration into higher education.

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Students who reported having chosen the Collective Health program due to the ease of admission, not basing their decision on reasons related to professional valorization and/or social prestige of the profession, family influence and/or vocation, were 96% less likely to drop out higher education compared to the reference group, that is, the group of students who did not leave the program. Probably, students who chose the program due to low competition have a lower potential for disappointment with it and a limited capacity to choose other programs, thus valuing the opportunity to obtain a higher education degree at a prestigious federal university, regardless of the program. The Collective Health program has the easiest admission among those available on the UnB campus in Ceilândia, and one of the easiest at UnB.

The two variables that represented satisfaction with the program—identification with the program and empathy with the faculty—influenced dropout rates of both program and higher education. The probability of students who identify with the program and faculty changing program is 61% and 53% lower, at a 5% significance level. In turn, their probability of dropping higher education is 71% and 50% lower. This shows that students who identify with the program and/or who develop a good relationship with professors are more likely to complete the FCE Collective Health program.

Nunes et al. (2020) pointed out that professors are responsible for providing students with experiences that lead to self-knowledge and the power of listening and tolerance, so students can recognize their weaknesses and fears. It is understood that professors are strong influencers and that they are sometimes observed as parameters by their students. In this sense, empathy (as in all fields of life) is an essential element in the academic setting, and can have a positive impact on education and, consequently, on student permanence. Ambiel et al. (2018, p. 14) verified the influence of socio-cognitive and socio-affective variables on evasion, concluding that "the belief in being organized, self-regulated, and self-motivated leads students to see themselves with lower changes of dropout".

The qualitative studies by Zając and Komendant-Brodowska (2019) discuss voluntary abandonment. These studies found that university dropout can result from a disappointing interaction with the institution, in which a single incident or experience rarely has an effect. The authors found that professors' low commitment to teaching, little willingness to dialogue with students, and a lack of teaching skills can translate into supposedly boring classes, negatively affecting students.

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Identification with the program and with their professional career tends to reduce dropout, since professional aspirations linked to personal satisfaction, and not exclusively to the financial gain of the profession, are a determining factor for students to stay or abandon the program (Casanova et al., 2018; Mujica et al., 2019).

The variable that measured the incompatibility between academic life and work presented a contradictory result between the decisions to change program and abandon higher education. Its influence on the decision to change program was indirect, that is, increased incompatibility reduces the probability of changing program by 34%. Conversely, each point increase on the Likert scale—confirming the existence of incompatibility between academic life and work—is associated with an increased probability of the student leaving higher education by 315%. Along with sex, these were the variables with the greatest impact on system dropout, and thus, the probability of male students with a high workload dropping higher education is much higher.

The contradictory effect of work on the decision to change program or abandon higher education is corroborated by Moulin et al. (2012). The evidence of these authors showed that working for many hours had a significant effect on students who left higher education, but did not affect students who changed program or educational institution.

The complexity in understanding the influence of work on academic life was expected and is widely discussed in the work of Hovdhagen (2015). According to Hovdhagen (2015, p. 632, free translation), "it is likely that a moderate degree of work does not have a strong impact on studies and, in most cases, work interferes with students' leisure time, not with study time." Moreover, the option to work during academic life may be a choice, and not a need of the student, aiming at the gain of experience and better positioning for future employability. In this regard, it should be considered that UnB is free and has a broad student aid program, although insufficient and with aspects that can be improved (Almeida et al., 2021).

The group of students who reported having changed program had the highest frequency of "strongly disagree" responses for the statement "I experience incompatibility between academic life and work" (19%, according to Table 2). It is a group with a lower need to work and that probably has the financial conditions to abandon a program and start another, that is, it has more decision time to choose their professional career. Conversely, the group with the highest percentage of "strongly agree" responses in the same variable was the group of those

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who left higher education (56%). In the latter case, the explanation is that work is a necessity, making it difficult to follow the university and contributing to increase dropout rates.

Final Considerations

The results of this research showed that dropout is a complex and multicausal problem, related to individual, family and institutional issues. Although this topic is widely addressed in the literature, the main contribution of the work was to approach dropout from the perspective of its different concepts, analyzing its causes. The study demonstrated that program dropout and higher education dropout are distinct phenomena, influenced by different variables and in a varied manner.

Among the individual factors, advancing age is associated with the decision to change program and, with a much greater influence, with the decision to leave higher education. On the other hand, only the decision to leave higher education was associated with student sex, with males more likely to drop out of the system.

We found no family influence on the decision to leave higher education, but, on the other hand, students who reported having parents who participated in their academic development stood out among those who decided to change their program. This is a decision motivated by personal matters perhaps even more difficult than those associated with abandoning higher education, which may be unrelated to the student's will, such as the need to work to support the family. Thus, family participation in the student's career choice was more evident than its influence on the choice of obtaining or not a higher education degree.

The decision to change program requires the student's capacity to be admitted into another program, certainly more competitive, as well as financial support that enables them to postpone entering the labor market. Conversely, the decision to leave higher education may be associated with difficulties in following the program, due to the need to work full-time or deficiencies in basic education. In other words, decisions to change program or leave higher education may be associated with the same factor, but in reverse. It is normal for some students to enter a lower-competition program, even if it is not their first choice, expecting to obtain credits in subjects and switch to the desired program in the future.

Two decisive factors for preventing student dropout, either by changing program or abandoning higher education, were associated with student identification with the Collective

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Health program and empathy with the faculty. Notably, the Collective Health program is recent and little known and the professors constitute the main link between the profession and the aspirations of students, thus becoming a key element in the students' training and perception of the opportunities of the labor market of the profession.

The limitations of the research result from the difficulty of measuring and incorporating other variables. Thus, future studies should deepen the understanding of the effect of the observed variables, but using other measurement scales and disaggregating the results by gender, age, family income, and other control variables, as well as incorporating new variables that were not analyzed in this study. Although the theoretical framework on the causes of dropout has many references, the complexity and specificity of the phenomenon provides opportunity for qualitative research, either to find hypotheses for the issue and/or to understand behaviors of specific groups of students. Finally, the results of this research have a limited potential for extrapolation, especially in contexts that are different from that in which the data were obtained.

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Appendix 1

Questions of the questionnaire

STUDENT'S SITUATION AS TO DROPPING OUT
1) Have you ever dropped out of your program at any point in your academic life? If so, what was the main reason? ( ) I have never dropped out of the program ( ) Change of program ( ) Has dropped out of Higher Education so far 1.1) If your reason for dropping out was a change of program, to which course did you change? ( ) Nursing ( ) Pharmacy ( ) Physical Therapy ( ) Speech Therapy ( ) Occupational Therapy ( ) Another UnB program ( ) Another program at another institution
INDIVIDUAL DIMENSION
2) How old are you? _____ years 3) Sex? ( ) Female ( ) Male
FAMILY DIMENSION
4) My parents are active participants and closely follow my academic development and life. ( ) Strongly disagree ( ) Somewhat disagree ( ) Neither agree nor disagree ( ) Somewhat agree ( ) Strongly agree 5) My parents do not support my undergraduate education. ( ) Strongly disagree ( ) Somewhat disagree ( ) Neither agree nor disagree ( ) Somewhat agree ( ) Strongly agree
INSTITUTIONAL DIMENSION
Ease of admission into the program
6) What is the main reason why you chose this program? Mark only one option. ( ) Low competition for admission ( ) Other (Professional valorization, social prestige, family influence and/or vocation) 7) By what means did you enter the undergraduate program in Collective Health? ( ) Entrance Exam ( ) Other (PAS, ENEM, SISU, among others)
Program satisfaction
8) I identify with the training I chose. ( ) Strongly disagree ( ) Somewhat disagree ( ) Neither agree nor disagree ( ) Somewhat agree ( ) Strongly agree 9) There is empathy from faculty regarding my individual needs as a student ( ) Strongly disagree ( ) Somewhat disagree ( ) Neither agree nor disagree ( ) Somewhat agree ( ) Strongly agree

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Difficulty following the program
10) I experience incompatibility between academic life and work. ( ) Strongly disagree ( ) Somewhat disagree ( ) Neither agree nor disagree ( ) Somewhat agree ( ) Strongly agree 11) I have difficulties in the teaching-learning relationship. ( ) Strongly disagree ( ) Somewhat disagree ( ) Neither agree nor disagree ( ) Somewhat agree ( ) Strongly agree