

## **Chapter 9 Impact of tutorial activity on the desertion of dentistry students' generations 2016-2020 at the Universidad Autónoma de Campeche**

### **Capítulo 9 Impacto de la actividad tutorial en la deserción de las generaciones 2016-2020 de estudiantes de odontología de la Universidad Autónoma de Campeche**

LEÓN-PÉREZ, Floribeth\*, BRICEÑO-BUENFIL Diego and MONTEÓN-PADILLA, Víctor

*Facultad de Odontología y Centro de Investigaciones Biomédicas. Universidad Autónoma de Campeche.*

ID 1<sup>st</sup> Author: *Floribeth, León-Pérez* / **ORC ID:** 0000-0002-9338-9312, **CVU CONAHCYT ID:** 265759

ID 1<sup>st</sup> Co-author: *Diego, Briceño-Buenfil* / **ORC ID:** 0009-0006-9409-263X, **CVU CONAHCYT ID:** 1288408

ID 2<sup>nd</sup> Co-author: *Víctor, Monteón-Padilla* / **ORC ID:** 0000-0002-2325-229X, **CVU CONAHCYT ID:** 8720

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F. León, D. Briceño and V. Monteón

\* florleon@uacam.mx

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## Abstract

Tutorial attention is one of the most valuable tools to reduce school dropout, through tutoring, it is possible to investigate the causes that lead the student to make the decision to drop out and propose solutions to various problems to support the student. Since 2015, the UAC School of Dentistry implemented changes in the tutoring program, and in order to know its effect on dropout, a retrospective cohort study was carried out, in which generations of the PE of Dental Surgeon of the Autonomous University of Campeche (UACAM) during the period 2016-2020, the dropout rates per semester were determined, and it was related to the tutorial activity during the study period, risk measures were also calculated related to sex, age and place of origin. It was found that tutorial attention is a protection factor against dropout, students who are attended have a 72% lower risk of dropping out than those who are not. Factors such as being male or female, age, and origin was not a risk factor for desertion in this population. We conclude that the strategies of the tutorial action plan have positive effects to prevent the dropout of students from the UACAM Dental Surgeon program.

## Retrospective, Cohort, Desertion, Strategies

### 9.1 Introduction

During university life, students face various challenges, both academic and personal. Some of them have a negative influence, which can lead to poor academic performance and dropout. To reduce this situation, tutoring has been implemented, which has served to support the student during their university career. In Mexico, in 2000 the National Association of Universities and Higher Education Institutions (ANUIES) proposed tutoring and the guidelines that must be followed to improve the academic stay of students. (ANUIES 2000).

At the Autonomous University of Campeche (UACAM), tutoring was implemented in 2003 and from that time to date, the tutoring program of the Faculty of Dentistry has experienced changes in organization and strategies, some of these improvements have been evaluated from various perspectives, such as competencies, academic performance, and emotional intelligence. In the last 5 years a high graduation rate was detected, so we wanted to evaluate the program and investigate whether the tutoring program was the reason favoring the permanence of the students and influencing in some way the dropout.

This is a retrospective review analysis of academic files from the 2016 to 2020 generations considering the risks and possibilities of dropping out. We consider characteristics of our student population, place of residence, sex, age, the relationship between dropout and tutorial care. This study had no external funding.

### 9.2 Theoretical framework

Tutoring has been defined as a process of accompaniment, either individually or in groups, that a student carries out throughout their academic training. This process is provided thanks to a tutor who will be a guide in their studies at the higher institution and which has the purpose of supporting the student in both academic and psychological areas, with the main objective of increasing their efficiency, facilitating university transit and their adaptation to avoid desertion. (Soto et al., 2015)

The role of tutoring was analyzed by Cruz refers et al., 2011, who mention that during the 1970's a remarkable success was obtained in students by having a tutor. The studies had such an impact that a wide variety of disciplines began to incorporate tutoring as an important process for the psychosocial development of the student. (Cruz et al., 2011)

In Mexico, in 1991, the faculty of medicine at UNAM began with high-performance programs for outstanding students. A year later, the University of Guadalajara established that every member of the academic staff must play a tutor role. Thus, in 2000, the National Association of Universities and Higher Level Institutions (ANUIES) proposed tutoring as a viable and strategic resource to improve student performance. (López Ortega, 2003)

The tutorial activity can be implemented in two ways: individually and group. The individually tutoring has been defined as “a space for dialogue between tutor and student” (García et al., 2008), this is an essential for those cases of students who need help at critical moments during their training. The group tutoring has greater flexibility, it is supported by management instruments in the educational institution and change depending on the needs of each group. (Vásquez & Aldana, 2014)

In this context, the Autonomous University of Campeche implemented an individual and group tutoring program in 2003, providing students with support in academic, administrative, and professional aspects. Later in 2013 the program was renewed including a training plan supported on actions with goals and procedures to achieve them. For this purpose, it is necessary to update and carry out evaluations of the program and verify that it really meets the requirements for what it was created.

We understand desertion as abandonment of a study program before completing it, considering that it is left for a time long enough to continue. This is usually a complicated issue to address because it is caused by different factors, which has been a topic of study for several decades, yet the problem continues without a conclusive solution. (Poveda, 2019)

Dropping out of school can generate high social and private costs, as stated by Espíndola & León in 2002, who consider that when people have not reached certain minimum levels of education to take advantage of the benefits of training programs offered by the state or by companies, is an indication of illiteracy which causes less social integration. (Espíndola & León, 2002)

From the above, we understand that dropout is a problem that concerns both the student and society. In addition, it has an impact on financial support for institutions, because public institutions that have a higher dropout rate do not meet satisfactory results, and consequently they may receive fewer resources, and having a smaller number of students. (Smulders Chaparro, 2018)

According to Gallegos et al., in 2018, there are two types of dropouts, voluntary and involuntary, in the first one the dropout is because students decide to start another career or go to another institution to finish it, among other causes. The second is associated with academic failure, this type of abandonment is the most frequent. (Gallegos et al., 2018)

The reasons for dropping out, according to the National Development Plan 2007-2012, can be: a) low grades in high school studies, b) marital status and c) the need to share the time dedicated to studies with work activity. In order to find the factors that influence the dropout of students in institutions, it is possible and necessary to evaluate it from both a quantitative and qualitative perspective. (Florically & Chulim, 2012)

Within the quantitative evaluation, various studies have been carried out to demonstrate the benefit of tutoring in the comprehensive development of students, promoting learning and mitigating abandonment, as reported by Clerici R & Da Rel. 2018 in the University of Padova, Italy. They determined the effectiveness of a tutoring program in two groups of students, one with tutorial attention and the other without, but with similar characteristics, the main findings were that school dropout was reduced by 50% and academic performance improved in the attended group comparing to the non-attended group. (Clerici & Da Re, 2018)

Likewise, in 2020 Pupiales Rueda conducted an ethnographic investigation based on interviews, observation, and analysis of documents on tutoring, at the Technical University of Lisbon, Portugal. He concluded that tutoring helps to reduce both personal and academic risk of students, additionally an improvement of the professional development of the teacher. (Pupiales Rueda, 2020)

Similarly, Muñoz Valera conducted a study in 2013 on the impact of the advisory service on students at risk. Its objective was to investigate the perception that students have about the academic advisory service, based on condition of assistance and overcoming risk. Interviews were conducted in students in a situation of academic risk, their perception was investigated based on four dimensions: service, methodology, facilitator, and suggestions. Conclusions support that tutoring and guidance programs have positive impact on the performance of students. (Muñoz Valera, 2013)

Tutoring is extremely important both globally and nationally according to Molina, E. C., Rafael, E., & Heredia, F. (2022) and Saucedo et al., 2023. Data from the Secretary of Public Education in Mexico reported dropout rates in primary, secondary and high school are 0.6%, 4.4% and 12.9% respectively for the periods of 2018 to 2019, while at the university or higher level the dropout rate is 8.3%. , although it is lower than high school measures must remain or even be intensified to reduce this school dropout at these levels. (SEPW, 2019)

Given this panorama, in Mexico, various studies have also been carried out, which have demonstrated the importance of tutoring to promote permanence, for example, in 2015 Soto Patiño J.C et al, at the Irapuato Higher Institute, analyzed the relationship between tutoring and the influence it has on dropout. They found that, by using a focused tutoring model, the failure and dropout rate in students in the first semester could be reduced with a decrease of 5% and with respect to dropout in general, a decrease of 5.9% was obtained in the period of the 2012 to 2014. (Soto et al., 2015)

In 2015 in our institution UACAM León et al, carried out a comparison study between the dropout rates from 2008 to 2015 in students of the first semester of dental surgeon program at Campeche State University, they found a significant decrease (from 21% to 3% ), while the retention rate remained constant at around 70%, so they concluded that the strategies implemented during the study period were favorable to address the problem. (León Pérez et al, 2015). However, INEGI reports from 2000 to 2022 reported high school dropout rates between 11.1% to 12.8% for Campeche state and like Quintana these two states being the ones with the highest dropout rates in the south-southeast area of the Mexico country. (INEGI 2022)

### 9.3 Methodology

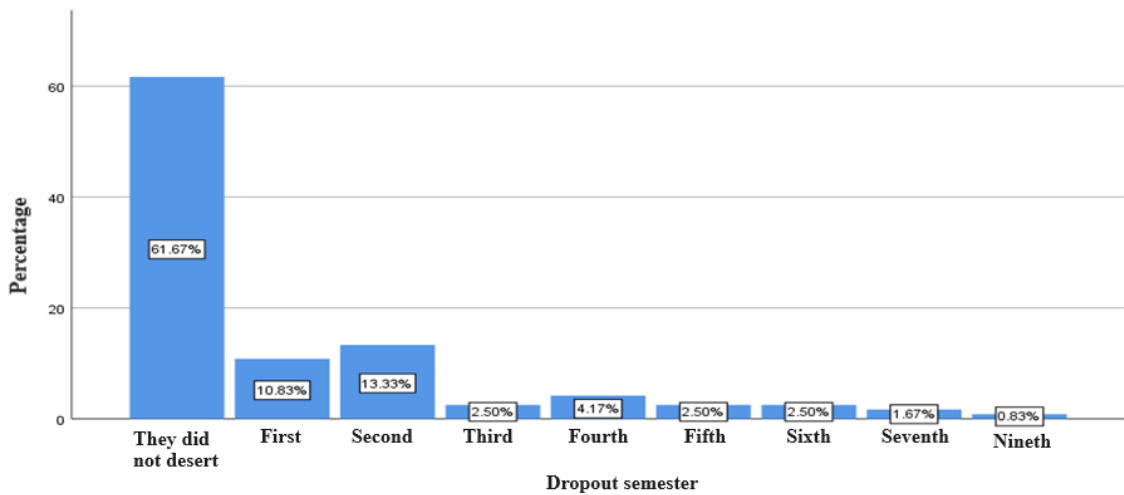
This is an observational, analytical, retrospective cohort study, carried out in the period from June 2021 to December 2021. The population studied were students who completed the degree in dental surgeon during the period 2016-2020 at the Faculty of Dentistry of the UACAM. The students' academic files were reviewed and analyzed by cohort from 2016 to 2020. The data was handled confidentially, respecting the privacy of those involved.

The dependent categorical, nominal dichotomous variable was dropout, the independent variables were age (quantitative ratio), nominal dichotomous and polychotomous: sex (1=Male, 2=Female), place of origin (1=Campeche, 2=Yucatán, 3=Quintana Roo, 4=Municipalities and 5=Others), school period (1=2016, 2=2017, 3=2018, 4=2019 and 5=2020) and tutorial attention (1=attended and 2=not attended). Statistical analysis. For the descriptive phase, frequencies and percentages were determined for nominal variables, as well as contingency tables to identify the distribution of the dependent variable with respect to the independent variables. In relation to the quantitative variables, measures of central tendency (mean, median and mode) and dispersion (standard deviation and variance) were obtained. SPSS statistical software was used to analyze the data obtained. In the analytical phase, the Chi square test was used to determine the association between the variables; relative and attributable risk, as well as absolute risk reduction and relative risk reduction, were also determined. using contingency tables and by formula, with the SPSS version 15 program.

### 9.4 Results

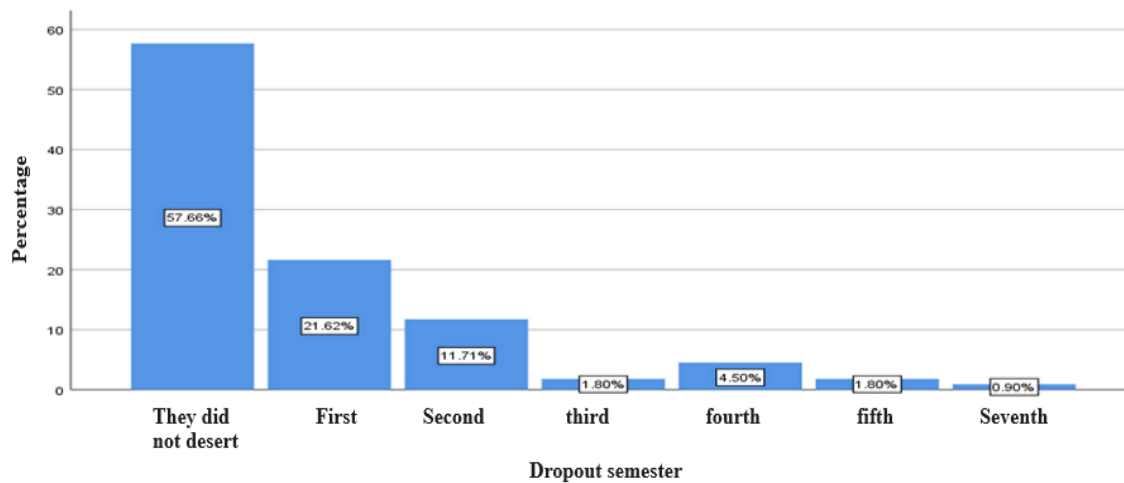
*Descriptive phase.* The generation 2016-2021 of dental surgeon program of the Faculty of Dentistry at the Autonomous University of Campeche consisted of 120 students (43% male and 57% female). With a mean age of 18.9 years and a standard deviation of 1.523. An overall 39% (47/120) of dropout was found for this generation. The frequency and percentage of dropouts per semester were calculated, as shown in Fig. 1- It is observed a dropout of 10% for the first semester and 13% for the second, but in the third and higher semester dropout felt between 4 to 0.8%. On the other hand, the frequency of students attended in the first semester was 64%, in the second semester 57%, but in the third and higher semester the percentage of attended student felt between 37% to 9.2%.

**Figure 9.1** Percentage of students who did not drop out (1st column) and students who dropped out by semester during the period 2016-2021



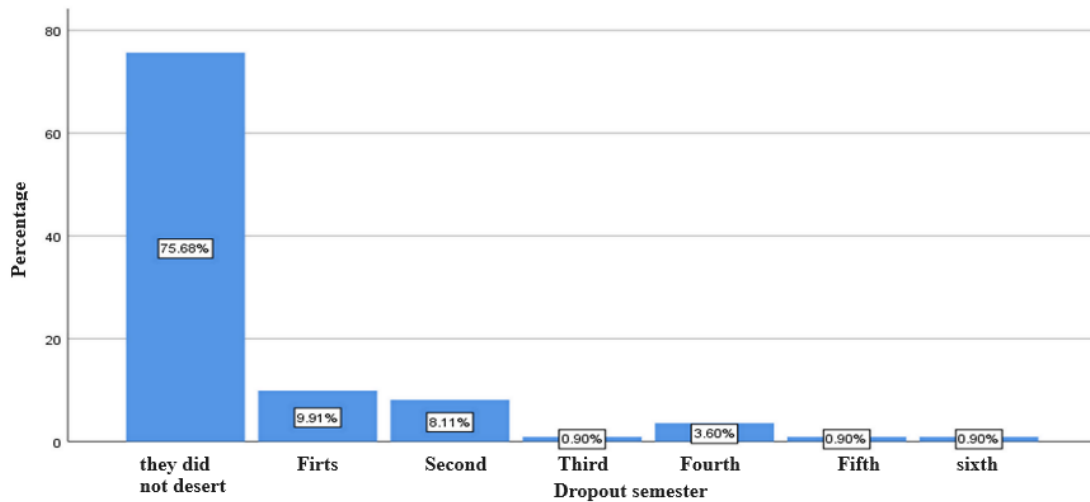
The generation 2017 consisted of 111 students (39% men, 61% women) with an average age of 19.16, and 43% of dropout. Dropout frequency along their stay at the university as shown in Fig. 2. The dropout percentage in the first and second semester was 21% and 11% respectively, but third and higher semester the dropout was between 4% to 0,9%.

**Figure 9.2** Percentage of students who did not drop out (1st column) and students who dropped out by semester during the period 2017-2022



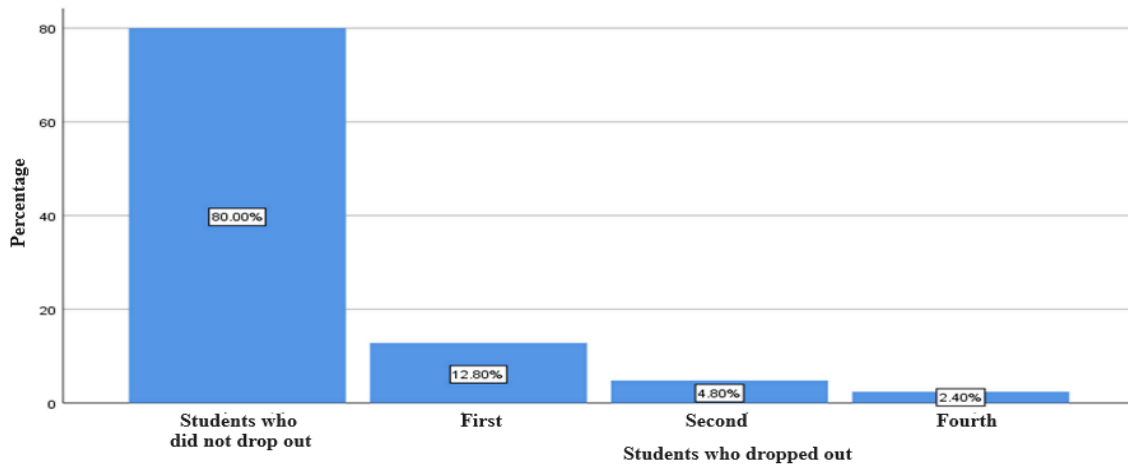
The 2018-2023 generation consisted of 111 students (33% men and 67% women) with an average age of 19.1 with dropout of 24%. The dropout percentage in the first and second semester was 9% and 8.1% respectively, but in the third and higher semester the dropout was between 3.6% to 0.9% a 0.9 in the third, 3.6% in the fourth, 0.9% as can see in figure 9.3.

**Figure 9.3** Percentage of students who did not drop out (1st column) and students who dropped out by semester of the 2018-2023 generation



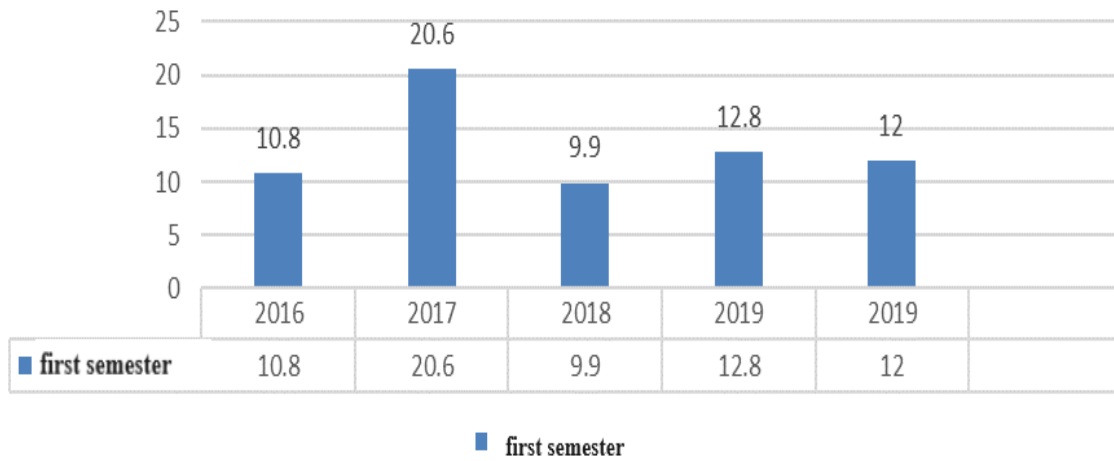
The 2019 generation consisted of 125 students (30% men, 70% women) with an average age of 18.9. A dropout percentage of 20%. In the first and second semester was 12.8% and 4.8%, but in the third and higher semester until the fifth semester, in the first and second semester was 12.8% and 4.8% respectively. But in the third 0% and in the fourth only 2.4% as shown in Fig. 9.4.

**Figure 9.4** Percentage of students who did not drop out (1st column) and students who dropped out by semester of the 2019-2024 generation



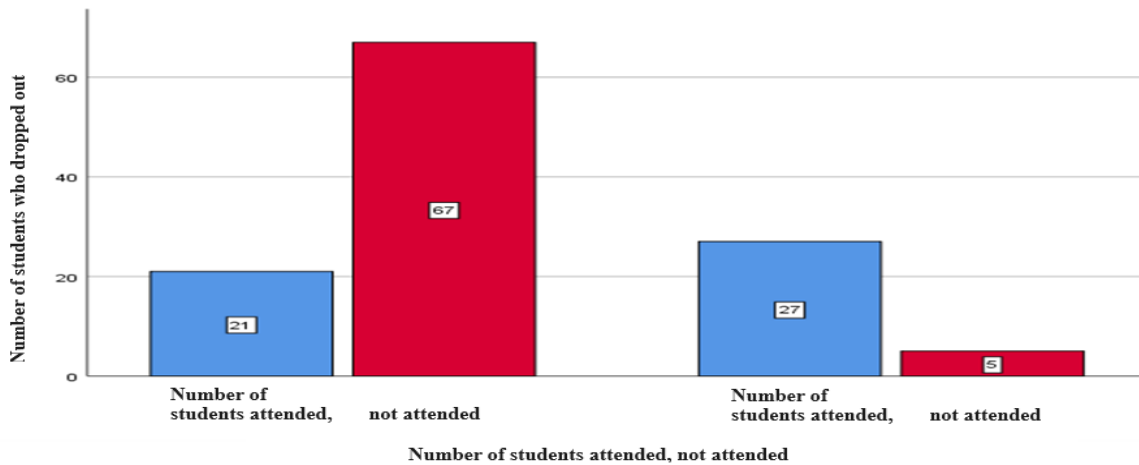
The 2020-2025 generation consisted of 180 students; the overall dropout was 12%. Our study analysis stops in this 20-20-2025 generation. According to our results, the first semester shows the highest dropout for all generations. But 2017-2022 generation presented the highest dropout (fig. 9.5).

**Figure 9.5** Dropout rates during the first semester in generations studied



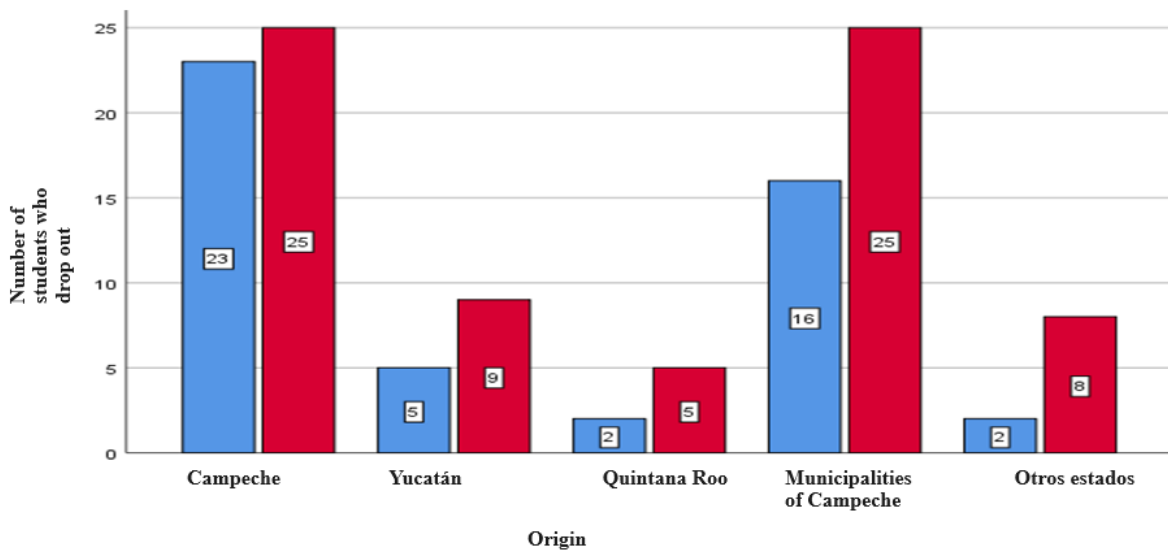
*Analytical phase.* The association between tutorial attention and dropout was determined in the students of the 2016-2021 generation, a Chi square value of dependent, that is, attention influences dropout. Of the students who received attention from a tutor, only 24% dropped out, while 87% of the students who were not attended dropped out, as can be seen in fig. 9.6.

**Figure 9.6** Percentage of students who were attended and not attended vs who dropped out and who did not drop out (blue and red columns respectively) in the 2016-2020 generation of the dental school.



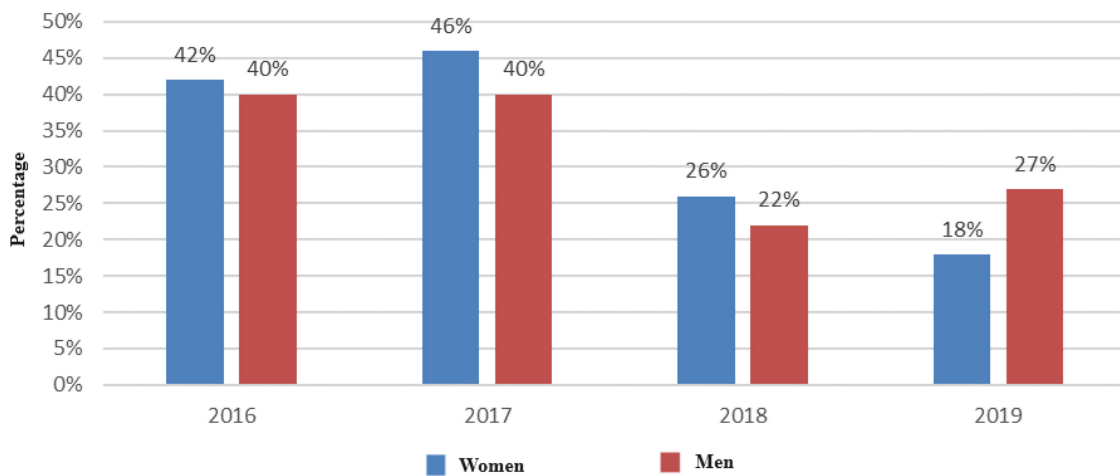
When analyzing the association between the place of origin and the dropout of the 2016 generation. In figure 9.7 shows the highest dropout rate for students of Campeche city (48%), followed by students who come from municipalities of Campeche State with 40%, the students coming from other state but in the same Yucatan peninsula such as Yucatán state and Quintana Roo states showed 36% 29% respectively and students from other states of the republic the dropout was only 20%. However, being a foreigner is not a factor that influences the permanence of students.

**Figure 9.7** Number of students who dropped out from different places of residence (blue columns for women and red columns for men), 2016 generation



When analyzing the association between sex and dropout per semester, female sex (42%) had a higher dropout in 2016 compared to the male sex (40%). In the 2017 generation, 46% were female and 40% male, and in the 2018 generation, 26% women and 22% men dropped out, however, in the 2019 generation, the male sex had a higher dropout (27%) compared to the female sex (18%) (fig. 8).

**Figure 9.8** Percentage of women and men who dropped out in the 2016-2019 generations



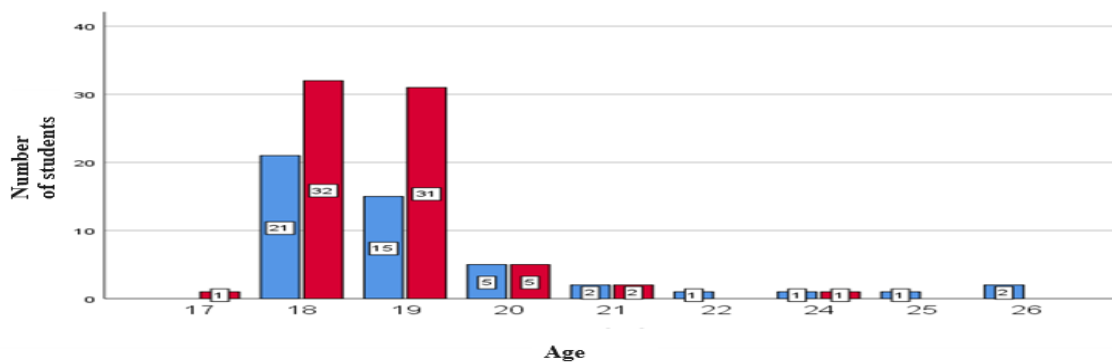
Regarding age. A total of 120 students who began their studies in the 2016-2021 generation, 53 students were 18 years old when they began their studies, they represented 45% of the total population. Out of 53 students who dropped out 32 corresponded to this age group for 60% of dropout.

The second age group, with a high dropout rate, was 19 years old, consisted of 46 students (39% of the generation). 31 students from this group dropped out, therefore the dropout rate was 67 % students. (fig.9.9).

These two age groups had the highest dropout rates. When performing the Chi square test to determine if age influences dropout, in the 2016-2020 generation, a value of  $X^2=8.384$  and a significance of 0.397 was obtained, so there is not enough evidence to affirm that age influences dropout from the group studied.



**Figure 9.9** Number of students who remained and who dropped out, aged between 17-26 years in the 2016-2020 generation



To determine the impact of tutorial attention, the relative risk (RR, also known as risk ratio) was calculated between the total number of students who were assisted who dropped out and those who did not drop out, with students who were not assisted who dropped out and who did not. The incidence among exposed is 0.23 (a risk of exposed: 23.86%) with a confidence of 95%, an interval of 0.16 to 0.33 and the incidence of unexposed 0.84 (a risk of unexposed: 84.38%) with an interval of 0.67 to 0.93. The relative risk (RR) in the group was 0.28, with an interval of 0.18 to 0.42, it can also be expressed in the following way, the students attended have 72% lower risk of dropping out than those who do not receive care (1-RR).

The RR is useful in our study since when the value is less than 1, tutorial attention turns out to be a protective factor against dropout and although it is not the only variable, however, is a factor that protect against dropping. This is also verified with other impact measures such as Attributable Risk, Absolute Risk Reduction and Relative Risk Reduction (RA, RAR and RRR), which are shown below: An RA of 0.60 means that the attention has reduced the risk of dropping out by up to 60%.

The RA is like the Absolute Risk Reduction (RAR), which was calculated as follows:  $RAR = \text{Risk of non-exposed} - \text{Risk of exposed} = 0.84 - 0.23 = 0.60$ , this represents that care has been avoided by up to a 60% desertion. The RRR was calculated as follows:  $RRR = \frac{\text{Risk of non-exposed} - \text{Risk of exposed}}{\text{Risk of non-exposed}} = \frac{0.84 - 0.23}{0.84} = 0.60 / 0.84 = 0.7172$ , this means that the population of students who received attention reduced dropout by 71.72% compared to the population of students who did not receive attention.

Similarly, the RRR was determined in terms of student dropout by sex and origin. Obtaining a value of  $RRR = 0.52$ , which indicates an inverse association, that is, the sex variable cannot be considered a risk factor for the students since it is less than 1. With respect to origin, the Relative Risk was of 1.05, which indicates that a student who lives in the city has the same risk of dropping out as another student from another place.

The above is important because although dropout is multifactorial, in this study we found that age, sex, as well as place of origin are not the main factors that directly influence dropout, but attention have a positive impact, that is, attended students have a lower risk of dropping out than those not attended. However, more studies are recommended to identify other factors that influence dropout and to restructure the tutorial action plan of our faculty so that to improve supporting to students and achieve their academic and personal goals.

## 9.5 Conclusions

Tutorial attention throughout the scholar 'life is a protective factor that can reduce or prevent dropout; those who are assisted have a 72% lower risk of dropping out than those who are not. The highest dropout rate was observed in 2017, which coincides with the absence of tutors during that period in our faculty. In the population studied, variables such as sex, age and origin are not factors influencing dropout in the group studied.

### *Improvement proposals*

1.- Carried out new strategies on student of the first year because their highest dropping out. Search for economic factors, skill capabilities on comprehensive and theoretical abstracting, their background knowledge and professional orientation to dental career.

2.- Focusing on tutor-student communication.

3.- Prospective studies must be carried out to find other risk factors on students of high semester.

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