



## STUDY PROTOCOL

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## Common mental disorders and related factors in undergraduate and graduate students from three dental schools in Cartagena, Colombia.

**Abstract:** Considering the growing incidence of mental disorders in young population worldwide, the aim of this research is to estimate the prevalence of common mental disorders (CMD) and related factors in dental students from Cartagena, Colombia. Methodology: A cross sectional study will be performed on all undergraduate and graduate students of Dentistry in Cartagena, Colombia. A population of 1.072 students will be completed by taking a census. The measurement of CMD will be made through Goldberg's 12-item General Health Questionnaire (GHQ-12) using a self-administered survey about the presence of sociodemographic, personal and academic factors. It will be requested a full list of the participating dental students from each center and codes will be assigned to maintain data confidentiality. Once the information is collected, it will be tabulated and analyzed using descriptive and inferential statistics through X<sup>2</sup>, student's t-test and multivariate logistic regression analysis. Additionally, CMD found in the final sample will be described: anxiety and depression, social dysfunction and loss of confidence and self-esteem. The statistical analysis will be done using STATA™ for Windows. Expected outcomes: it aims to study presence and distribution of CMD among dental students and their relationship with other variables of interest. Then, taking that information into account, to suggest possible intervention strategies targeted according to risk type.

**Keywords:** *epidemiology; dental students; mental disorders; anxiety; depression.*

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### INTRODUCTION.

Dental education is challenging and its demands often deplete students' mental resources decreasing their psychological resilience and making them susceptible to negative physical and mental health states<sup>1,2</sup>. In 1978, Wexler showed that certain fields present inherent problems which are felt through psychological symptoms such as anxiety and sometimes panic<sup>3</sup>.

Compared with the general population, dental students report experiencing anxiety and depression levels which are sometimes higher than those seen in psychia-

tric patients<sup>4,5</sup>. In Colombia, in 2013, Divaris, *et al.* showed alarming psychological distress levels in dental students through a multicenter study. Also, they described multiple related triggering factors (sex, social strata, economical support, and curriculum) for such psychological distress<sup>6</sup>. On the other hand, some factors such as having children and working simultaneously or even completing clinical rotations<sup>7</sup> can overload these students, making them more susceptible to developing other diseases such as burnout, which has a high prevalence among dental students, or generate suicidal thoughts<sup>8,9</sup>.

It is clear that a student with psychological distress is more likely to develop a common mental disorder (CMD) if the sources of this discomfort are not dealt with in time<sup>10</sup>. These CMD include a spectrum of psychiatric disorders like depression, suicide, anxiety, psychosis (neurosis), agitation, epilepsy and alcoholism<sup>11,12</sup>.

Psychosis or neurosis is the most severe mental disorder in the population. Although its frequency is not very high<sup>13</sup>, it is essential to identify it and start early treatment to avoid visits to specialized mental health centers. These patients show several abnormalities which may include: delusions, incoherence, inappropriate feelings, excessive agitation or slowness of movement, among other symptoms<sup>11,14</sup>.

Given the severity of this disorder, in 1997, Goldberg *et al.* proposed the use of the 12-item version of the General Health Questionnaire (General Health Questionnaire-12) for evaluating emotional symptoms, psychological well-being and common mental disorders in the general population and for first complexity level in adolescents and adults<sup>15</sup>.

In 2011, Santander *et al.*<sup>16</sup> estimated a point prevalence of 39% of CMD among medical students in Chile using the GHQ-12. The presence of emotional symptoms was positively associated with the female gender and recent personal events.

In 2002, Madhan, Rajpurohit and Gayathri<sup>11</sup> described mental health (depression, anxiety and stress) in orthodontic graduate students using the DASS-21 scale. As a result, they found that, compared with the general population, these subjects reported moderate to high depression and anxiety levels and high stress levels. Also, a moderate number of coexisting described symptoms were seen in 15.8% of these students and women were twice as likely to suffer depression. These results indicate sub-optimal mental health levels in these students and the need to improve their mental resilience and the academic climate<sup>17,18</sup>.

Even after having extensively researched stress conditions, anxiety, depression and burnout in dental stu-

dents, the occurrence of CMD such as neurosis has not been well documented.

## RESEARCH QUESTION

What is the prevalence of common mental disorders and related factors in undergraduate and graduate dental students from Cartagena, Colombia?

## OBJECTIVES.

General Objective:

To estimate the prevalence of CMD and related factors among undergraduate and graduate dental students in Cartagena, Colombia.

Specific Objectives:

1. To describe the sociodemographic conditions of undergraduate and graduate dental students from three dental schools in Cartagena.
2. To determine the prevalence of CMD in undergraduate and graduate dental students from three dental schools in Cartagena.
3. To estimate the general mean values of GHQ-12 and domains in undergraduate and graduate dental students from three dental schools in Cartagena.
4. To compare the general mean values of GHQ-12 scores and domains in undergraduate and graduate dental students from three dental schools in Cartagena according to the sociodemographic variables of interest for the study.
5. To relate the factors under study to the occurrence of CMD in undergraduate and graduate dental students from three dental schools in Cartagena.

## METHODOLOGY.

Study Type: An observational cross-sectional study.

Population and sample: it consisted of all students from three faculties of Dentistry in Cartagena who voluntarily wished to participate in the research. At the beginning of 2014, the estimated population was 1072 undergraduate and graduate students of Dentistry in Cartagena, Colombia. This population was divided in

454, 245 and 301 undergraduate students from three schools (two private and one public), respectively. In addition, 72 graduate students from the public institution involved in the investigation. Then, the information from each school was collected through census to complete the population size.

**Table 1.** Operationalization of variables under study.

VARIABLE	DEFINITION	NATURE	SCALE	MEASURE- MENT LEVEL
Sex	Phenotype and genotype characteristics which define an individual as male or female.	Qualitative	Nominal	Dichotomic
Age	Time in years since a person's birth.	Quantitative	Continue	Reason
Origin	A person's geographical place of origin.	Qualitative	Nominal	Polytomous
Marital Status	Law defining a person's civil status.	Qualitative	Nominal	Polytomous
Work status	Current conditions of the situation/ bind the productive sector of a subject.	Qualitative	Nominal	Dichotomic
Children	Situation which defines whether an individual has or does not have children at the time of the interview.	Qualitative	Nominal	Dichotomic
Common Mental Disease (CMD)	The psychiatric condition which with defines the individual some anxiety, depressive symptoms, etc.	Qualitative	Nominal	Dichotomic
Systemic Diseases	Time of the interview.	Qualitative	Nominal	Dichotomic
Semester	Student's actual academic level.	Qualitative	N/A	Ordinal
Type of Student	Student's academic status (regular or irregular) according to curriculum.	Qualitative	Nominal	Dichotomic
Academic Area	Student's training academic level (basic, pre-clinical or clinical).	Qualitative	Nominal	Polytomous

## SELECTION CRITERIA:

**Inclusion criteria:** Female and male dental students who were academically active in any of the three participating institutions at the time of the study.

**Exclusion Criteria:** Students who did not wish to participate in the investigation and who had been previously diagnosed with a mental pathology.

## Variables

The dependent variable was defined as the presence or absence of common mental disorders (CMD). The independent variable was defined as sociodemographic (sex, age, national origin, marital status), personal (employment status, having children, history of mental illness) and academic (semester completed and cumulative average) variables of interest for the study.

## STUDY PROTOCOL AND INSTRUMENTS.

Initially, the sampling aspects related to each of the participating centers were defined. Following this, the research team from the main center, designed a survey instrument for collecting information taking into account the variables previously described in the study.

The instrument consisted of two parts: administrative aspects which measured all sociodemographic and academic aspects, medical history and personal issues (family role, sport, etc). This section consisted of multiple-choice questions and was designed by the principal investigators considering recent literature reviews on the subject. Also, this instrument was self-administered in order to avoid bias reporting. The variables studied are shown in Table 1.

For measuring CMD, the validated Spanish version of the *General Health Questionnaire-12* (GHQ-12)<sup>19</sup>, widely used in biomedical research<sup>16,20</sup>, was used. GHQ-12 is an instrument designed to assess emotional symptoms, psychological well-being and common mental disorders in the general population and for first level of complexity in adolescents and adults<sup>15</sup>. The original GHQ version had 60 points; currently, there are versions with 36, 30, 28, 20 and 12 points. The twelve-point version (GHQ-12) is preferred because of its shortness and faster delivery. It consists of

a Likert-type scale which explores symptoms during the previous month with a pattern of four ordinal response options from never to always with 0 being the lowest possible score and 36 the highest possible score<sup>19</sup>.

Interpretation of the test results suggested that a score  $\geq 11$ <sup>15</sup> indicated the presence of some kind of symptoms of common mental disorder. This cutoff is widely supported in scientific research with this instrument, yielding good inter-

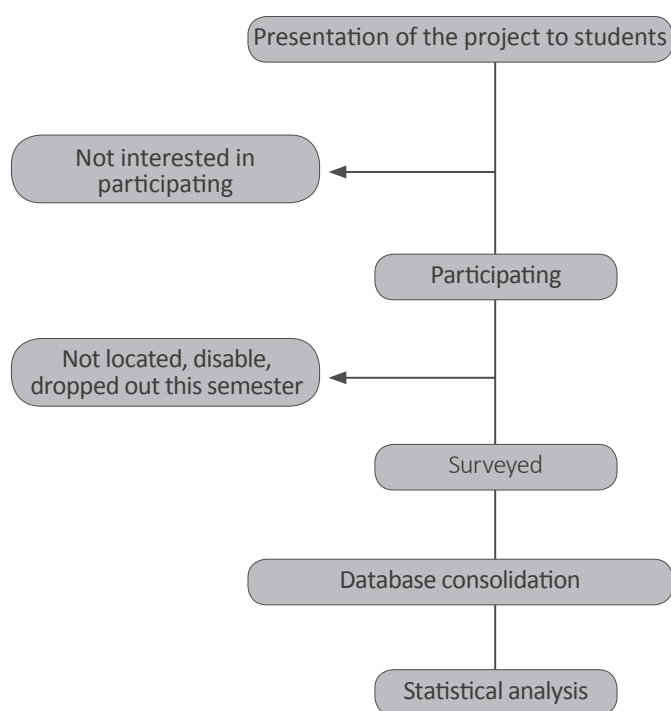
nal consistency<sup>19</sup> and appropriate results through confirmatory factor analysis<sup>17</sup>.

Additionally, this instrument can achieve discrimination of symptoms in three factors: anxiety and depression (items 1, 2, 7 and 10), social dysfunction and loss of confidence (items 3-6, 8 and 9) and self-esteem (items 11 and 12)<sup>20</sup>, with higher scores indicating greater severity of symptoms.

Once the instrument was ready, it was applied. For this, the person in charge of each center asked the Academic Department of each school the list of students enrolled. A particular system of alphanumeric codes was created for each institution/facility to enable students to identify if they were positive for any CMD. These codes were assigned to each student registered in the list. Likewise, they were only known by the two main investigators (Figure 1).

Thus, a schedule for applying the instrument to the entire group in a single attempt was estimated (Figure 2). If a student was not surveyed in this first attempt, he/she was immediately located in order to obtain the data.

Figure 1. Flowchart of the study.



### INFORMATION COLLECTION AND PROCESSING.

After having the instruments filled out by the participants, they were reviewed for completeness in its processing. If there were missing questions, they were returned to be filled it. Once the instrument was processed, the participants

Figure 2. Gantt chart.

ACTIVITY	1	2	3	4	5	6	7	8	9	10	11	12
Literature review						MSP - KAV						
Preliminary draft definition	MSP - KAV											
Cooperation actions		MSP										
Pilot Test			MSP - KAV									
Instrumental justifying				M - K								
Information collection				MSP - KAV - Assistants-Participating schools.								
Statistical analysis								MSP - KAV				
Final report and article										MSP - KAV		
Publication of results												MSP - KAV

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were asked to place the survey in a sealed ballot box to ensure confidentiality.

Subsequently, data was typed by the staff intended for that purpose (the responsible person for each center). Independent double checks were used for typing to minimize errors. Likewise, periodic verification was performed by the principal investigator.

For typing data, a matrix table was created in Microsoft Excel. It was designed by the principal investigator who regularly made virtual exclusive backups to be used by those responsible for each center.

### STATISTICAL ANALYSIS.

For the statistical analysis, univariate analysis using descriptive statistics according to the type of variable was initially used. For qualitative variables, proportions with confidence intervals at 95% were calculated. On the other hand, for quantitative variables, measures of central tendency and dispersion were calculated after the analysis of data normality which was done using Shapiro-Wilks test. If data followed a normal distribution, mean and standard deviation was reported; otherwise, median and interquartile range was described.

For the bivariate analysis,  $X^2$  or Fisher exact test for comparison of proportions was used. The strength of association between variables was estimated with odds ratios and confidence intervals at 95%. Likewise, the mean difference for the global (or factors) scale according to variables of interest was estimated using student "t" or Wilcoxon tests if data did not follow a normal distribution.

### **Trastornos mentales comunes y factores relacionados en estudiantes de pre y posgrado de tres facultades odontología en cartagena, Colombia. Protocolo de estudio.**

**Resumen:** Teniendo en cuenta la creciente incidencia de las patologías mentales en población joven a nivel mundial, el objetivo de esta investigación es estimar la prevalencia de trastornos mentales comunes (TMC) y factores relacionados en estudiantes de pre y posgrado de Odontología en Cartagena, Colombia. Metodología: estudio de corte transversal en todos los estudiantes de pre y postgrado de Odontología

In the multivariate analysis, a model using binary logistic regression was obtained. It defined CMD as dependent variable (categorization of the scores obtained with GHQ-12) and the independent variables as those which have had significance in the bivariate analysis and in the study context. Estimates of association of this regression were expressed as odds ratios and confidence intervals at 95%.

For data analysis, the STATA™ v.12 statistical package for Windows (4905 Lakedrive College Station, Texas, USA) was used. Finally, statistical significance was assumed when  $p \leq 0.05$ .

### ETHICAL CONSIDERATIONS.

This study was in agreement with the Declaration of Helsinki amended in Edinburgh as well as the resolution 008430, October 1993. Then, the present study is estimated as zero risk. Nevertheless, each participant was asked to sign a written informed consent.

Given the context of this study, if a participant was found to present CMD, he/she was sent to the University Psychology Welfare Service at each institution for proper management of the disease. The surveys collected in this investigation will rest in sealed envelopes in the offices of the Research Department of the Faculty of Dentistry of the University of Cartagena where only the principal investigators will have access to them for five years. After this time, they will be subjected to controlled incineration. Endorsement from the Ethics Committee of the University of Cartagena will be requested.

de Cartagena, Colombia. A través de un censo, se completará la población de estudio de 1.072 sujetos. La medición de los TMC se realizará empleando el instrumento General Health Questionnaire-12 (GHQ-12) a través de una encuesta autoadministrada que indaga además sobre existencia de factores sociodemográficos, personales y académicos. Se solicitará a cada centro participante un listado completo de los estudiantes participantes y se asignarán códigos alfanuméricos para mantener la confidencialidad de la información. Una vez recogida la información, será tabulada y analizada empleando estadística descriptiva con frecuencias, propor-

ciones, medidas de tendencia central y dispersión e inferencial a través de  $X^2$ , t de student y multivariado con regresión logística. Adicionalmente, se realizará una caracterización de los trastornos mentales comunes encontrados en la población: ansiedad y depresión, disfunción social y pérdida de confianza y autoestima. El análisis se realizará en el paquete STATA™ para Windows. Resultados esperados: Se pretende

investigar la presencia y, distribución de los TMC en estudiantes de Odontología y su relación con otras variables de interés. Así mismo y teniendo en cuenta los factores, sugerir posibles estrategias de intervención focalizadas por tipo de riesgo.

**Palabras clave:** *epidemiología; estudiantes de odontología; psicosis; ansiedad; depresión.*

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