

Characterization of Dating in University Students through Grouping Techniques

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Abstract. The present investigation has the purpose of knowing if in the relations of dating in students of a university of the south of Mexico present situations of violence, to be able to identify them and establish plans and programs that help to diminish them; as well as to characterize the types of violence in dating relationships. An online questionnaire was applied in which one of the sections is about dating, the descriptive clustering technique of data mining was applied to create groups with the characteristics of dating relationships in terms of what they would most allow, that they seek and what situations of violence they have lived within their dating. Four groups were formed, two formed by men and two by women, in which only one, formed by women from the Architecture degree, presented the situation of prohibiting and monitoring work or school friendships. It is concluded that it is necessary to conduct these types of studies in other faculties to also characterize these relationships in dating among students and implement actions according to the situations they present.

Keywords: Dating, data mining, grouping, violence.

1 Introduction

The Constitution of the World Health Organization establishes that health is a complete state of physical, mental and social well-being combined with this principle, the Universidad Juárez Autónoma de Tabasco in its 2016-2020 Institutional Development Plan establishes itself a promoter of health to favor the overcoming of the individual in all its human dimensions [1], this study is carried out with the objective of knowing the characteristics of their relationships such as what they would most allow and what they seek in their relationship and if there is some kind of violence in dating relationships; with the purpose of developing plans and programs to prevent and reduce situations of violence.

There have been several studies about dating violence. One of them was to know the factors and variables associated with this phenomenon, for this a questionnaire was applied to 376 students of different careers; they conclude that the factors that can affect situations of Violence in dating relationships are low self-esteem, parenting style. It is also stated that there are risk situations that raise the probability of present or future physical or emotional violent behaviors [2].

At the UAEM Zumpango University Center of the Autonomous University of the State of Mexico, an investigation was carried out to identify if there was violence in dating relationships among students, the sample consisted of 100 students, the instrument applied measured violence in four areas: economic , psychological, physical and sexual. As a result, they obtained that psychological violence shows in 92% in the immediate previous or current relationships. They point out that psychological violence is usually combined with some other type of violence [3].

At the University of Salamanca, a study was carried out to verify the relationship of sexist attitudes variables in the appearance and maintenance of violent behavior in couples and in this way to design prevention and intervention plans. The sample was composed of students from different careers, between the ages of 18 and 36 who had or had a relationship; the results showed that men report having committed more sexual aggressions and women more emotional verbal aggressions and there are no significant differences in the practice of physical aggressions. They conclude that it is necessary to investigate about ambivalent sexism towards men, more investigations of bidirectional violence in relationships of young people for the understanding, prevention and intervention in violence of young couples [4].

Another study to analyze the occurrence of aggressive behaviors in the dating of university students, was carried out at the Universidad de los Andes, in Mérida, Venezuela. They used Neidig's (1986) Modified Conflict Tactics Scale (M-CTS) instrument on psychological and physical aggression / victimization; which applied to 616 young people and their respective partners. The results indicate that the predominant tendency is psychological, reciprocal aggression, in relation to the gender perspective the indicators behave statistically the same in men and women, there is a significant difference in the prevalence of victimization due to mild physical abuse, it is men who suffer most from this type of abuse and women use physical and psychological aggression more frequently [5]. Other previous works have been developed using other techniques, such as association rules, GGE Biplots and Star Graphics [6-7].

2 Materials and Methods

The methodology used in the present study is qualitative and descriptive because it seeks to specify properties, characteristics and profile of groups [8]. In this case, violence in the dating of university students will be described by means of the data mining technique of the grouping with the objective of subsequently developing and implementing strategies to promote self-improvement, health and physical integrity [1]. The study population are the students of a university in southern Mexico of the Faculty of Engineering and Architecture enrolled in the August 2018 - January 2019 school period, which were 3,498. The sample was for non-probabilistic convenience, 574 students were chosen who had a year studied at the university, for this investigation 218 data of students and students who answered they currently have a girlfriend or boyfriend were selected.

2.1 Model KDD

Four variables were used to know the reasons why university students selected their careers, later these variables were related to student engagement. These four variables of the choice of studies are: the educational value, academic quality of the career, aptitudes for studies and the possibility of work. For this, four questions that measure these variables were taken as a basis and are integrated in an answer where 0 means nothing, 2 equals very little, 3 means little, 4 equals medium, 5 corresponds to enough, and 6 means a lot [10]:

- Integration and data collection: The sources of information that could be useful are identified and selected and their origin is determined. Then all the data is transformed to a common format, inconsistency in the data is eliminated, the data considered interesting is explored and identified.
- Selection, cleaning and transformation: The data is reviewed, the incorrect data is corrected or deleted, and it is determined the data or attribute relevant to the investigation.
- Data mining: In this phase the method, model and algorithm of the data mining to be used is selected and applied.
- Evaluation and interpretation: Evaluation and analysis of the obtained models, which may involve returning to the previous phases.
- Dissemination: The new knowledge is used and shared to potential users.

2.2 Data Mining

Data mining is the extraction of knowledge of large amounts of information using specialized techniques supported by technology and information technology; it involves the application of specialized techniques for the discovery of knowledge in large amounts of data to analyze behaviors, patterns, trends and associations [10]. According to Hernández, Ramírez and Ferri [11], data mining is understood as the process of extracting useful and understandable knowledge, from large amounts of data

stored in different formats. This knowledge can follow two types of models: Predictive or Descriptive.

Predictive models attempt to estimate future or unknown values from variables or fields in the database. Descriptive models identify patterns that explain or summarize data and serve to explore their properties. In this investigation, the descriptive clustering technic will be used [11].

2.3 Clustering

Clustering is a descriptive task of data mining that involves analyzing data and grouping it so that the elements of one group are similar with each other and very different from the objects of the other groups [11].

One of the techniques for clustering is the K means algorithm, this is a proximity-based method, it is based on a certain number of prototypes and a set of examples to be grouped, without labeling. K means places prototypes or centers in space, and thus includes data belonging to the same prototype with similar characteristics. The procedure of K means is as follows [11]:

- For each example x_k , the closest prototype A_g is calculated and included in the list of examples of that prototype.
- After having placed all the examples, each prototype A_k will have a set of data that it represents.
- The prototype moves towards the center of mass of the set it represents.
- Repeat the procedure until the prototypes no longer move.

2.4 Weka Software

WEKA (Waikato Environment for Knowledge Analysis) is an open source data mining software issued under the GNU General Public License is developed in Java. It is composed of a set of open source packages, including tools for preprocessing, classification, grouping, association and visualization. It includes a graphical interface that facilitates its use [12]. This software was selected to apply the grouping technique.

3 Development of Data Analysis to Obtain Clusters of Violence in Dating

The data set of this research consists of 218 students, of which 91 are women and 127 are men, from the Faculty of Engineering and Architecture of a university in southern Mexico, after applying online surveys to obtain general data and violence in dating. The sample has a minimum age of 18 years of age and a maximum age of 33, the average is 20,794 years of age and the standard deviation is 2,125, as for who solves the students' tuition 49% is the father, 22% both parents, 21% the mother, 9.70% the same student supports their tuition. 60.55% of the couples are dedicated to study, 20.64% work and 15.60% of the couples are dedicated to study and work.

Table 1. Characteristics of the population study sample.

Variable	Woman Yes	No	Man No	No
Kisses and Hugs	83	8	93	34
Caresses without Sexual intercourse	20	71	41	86
Sexual Intercourse	25	66	58	69

Table 2. Frequencies that seek in a dating relationship. Own elaboration.

Variable	Woman Yes	No	Man Yes	No
Preparing for starting a family	26	65	48	79
A way to getting to know someone before marriage	13	78	39	88
Somebody to have sexual a relationship with	13	78	39	88
Somebody to love and share mutual feelings	70	21	100	27
Company to go out and have fun	29	62	63	64

Table 3. Frequencies of aspects of violence presented in dating. Own elaboration.

Variable	Woman Yes	No	Man Yes	No
Insults and threatens of physical violence	8	83	13	114
Prohibition, surveillance or control of activities and friendships.	26	65	28	99
Monetary and spending control.	3	88	9	118
Physical aggressions with or without a weapon	3	88	5	122

Table 1 shows the frequency of responses to what they would most allow during dating, both women and men more frequently indicated kisses and hugs, followed by caresses without sexual intercourse, although in sexual relations Men are the ones who would allow it the most.

Table 2 shows the frequencies of what they are looking for in a dating relationship, showing that what they are most looking for is someone to love and with whom to share feelings, followed by company to go out and have fun.

Table 3 shows the frequencies of the aspects of violence presented in the dating; it is observed that the aspect that has been most presented is the prohibition, surveillance or control of activities or friendships.

Table 4. Grouping obtained with Weka software.

Attribute	Clusters				
	Full Data (143.0)	0 (70.0)	1 (27.0)	2 (11.0)	3 (35.0)
Sex	Man	Man	Man	Woman	Woman
Program	Bachelor of Architecture	Bachelor of Civil Engineering	Bachelor of Electromechanical Engineering	Bachelor of Architecture	Bachelor of Chemical Engineering
Who pays tuition	The father	The father	The father	The father	Both parents
Has worked before	Si	Si	Si	Si	Si
Live with	Parents	Parents	Parents	Parents	Parents
Preparing for starting a family	No	No	Yes	Yes	No
A way to getting to know someone before marriage	No	No	yes	Yes	No
Someone to have a sexual relationship with	No	No	Yes	Yes	No
Somebody to love an to share mutual feelings	Yes	Yes	Yes	Yes	Yes
Company for going out and have	No	No	Yes	Yes	No
I would allow kisses and hugs	Yes	Yes	Yes	Yes	Yes
I would allow caresses without sexual intercourse	No	No	Si	No	No
I would allow sexual intercourse	No	No	Yes	No	No
Insults or threatens of physical violence	No	No	No	No	No
Prohibition, vigilance or control of activities or friendships	No	No	No	Si	No
Monetary and spending control	No	No	No	No	No
Physical violence with or without a weapon	No	No	No	No	No

Phases of KDD

The KDD process was used to develop clustering, which is described below:

Integration and Data Collection

The data was obtained from a questionnaire applied online, exported to a spreadsheet, organized and passed into a pro-delimited CVS format that is recognized by Weka.

Cleaning and Transformation Selection

At this stage of the study, the data is reviewed, selecting those with characteristics that are relevant to the investigation.

Evaluation and Interpretation

For the validation of this technique given the number of records in the data set, Weka's 66% percentage split option was applied, the software automatically selects 66% of the data set for training and 34% for tests.

Results Obtained from the Group

The groups obtained through the clustering technique using the Simple K-means algorithm are shown in Table 4. The Weka data mining tool was used for this technique.

In total, four groups were formed, two formed by men from Civil Engineering and Electrical Mechanical Engineering degree respectively and the other two formed by Women from the Architecture and Chemical Engineering programs.

Group 0 is made up of men from Civil Engineering program whose fathers solve their studies and live with both parents, they have worked; They seek in their dating relationship someone to love and share feelings and what they would most allow are kisses and hugs, this group does not present any situation of violence in their dating.

Group 1 is formed by men from the Electromechanical Engineering program whose father solves their studies, they live with both parents, this group seeks in their relationship: preparing to start a family, a way to getting to know someone before marriage, someone to have sex with, company to have fun; allowing kisses and hugs, caresses without sexual intercourse and sexual relationships, this group does not present having experienced any situation of violence in their dating.

Group 2 is composed of women from the Architecture program, their father is the one who solves their studies and they live with both parents, they seek in their relationship to prepare to start a family, a way to getting to know someone before marriage, someone to have sex with, someone to love and share feelings and company to go out to have fun. The most that they would allow in a dating relationship are kisses and hugs, this group indicated having lived prohibition, surveillance or control of activities or friendships.

Group 3 is formed by women of the Chemical Engineering program whose both parents pay their tuition, seek in a dating relationship someone to love and share feeling and what they would be more willing to allow are kisses and hugs; and they have not experienced situations of violence in their dating.

4 Conclusions

Men predominate in this population sample due to the nature of the programs, of the four groups, two consisted of men and two by women, the groups formed by men did not show situations of any type of violence: psychological or physical, however, of the groups formed by women the one of the Architecture program stated to have lived situations of violence from partners when prohibiting, monitoring or controlling activities or friendships.

Although three of the four groups formed, have not experienced a situation of violence in their dating, analyzing the frequencies of those who answered having experienced a situation of violence, it is that for both men and women the most presented situation was to prohibit, monitor friendship with classmates from school or work, followed by criticizing the way of being, and insults. For women, the next situation of violence they have experienced with their boyfriend is that they have criticized their way of dressing, for men it is that they told them silly before other people.

Likewise, it is observed that the men reported a greater frequency regarding the following situations of violence; He has pushed you; He has slapped you and He has scratched you.

Comparing these results with those obtained by Olvera, Arias and López [3], a similarity is observed in that they mention that the type of violence that occurs most is the psychological one, followed by some other type.

Regarding the results obtained by Rodríguez [5], it can be concluded that it is also agreed that both men and women have lived in their relationships of psychological violence, and that men report more psychological and physical aggression than women.

It is concluded that these types of studies should continue to be carried out in the other faculties of the University, to compare the results between the different populations, and in this way the plans and programs to prevent and reduce situations of violence during dating are the most appropriate to those required by the students.

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