Deaths by Suicide in Ecuador: A Quantitative Data Analysis

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Abstract

The aim of the present study was to investigate the profile of Ecuadorians who died by suicide during 2011. The National Mortality Study of 2011 was used in order to investigate the variables: sex, age, marital status, area of residence, natural region, level of instruction, ethnic self-identification, pregnancy and types of suicide. A descriptive analysis, a multiple correspondence analysis and a hierarchical classification were realized. The analysis showed that the majority of the Ecuadorians who died by suicide were men, singles and married, they were living in urban areas, in the mountain range and coast region, they had attended Primary or Secondary education and died by hanging, strangulation and suffocation or by exposure to pesticides, other chemicals and noxious substances.

Keywords: suicide, deaths, Ecuador, quantitative data analysis

1. Introduction

The present study aims to investigate the profile of the Ecuadorians who died by suicide. In order to achieve this aim we used the last officially published data about the mortality in Ecuador (INEC, 2011).

According to the National Mortality Study of 2011, the Ecuadorians who died by suicide (919 deaths) represent 1.48% of the total number of deaths in Ecuador (62304) during 2011. The Ecuadorians who died by suicide during 2010 (913 deaths) represent 1.48% of the total number of deaths (61681) (INEC, 2010). The Ecuadorians who died by suicide during 2009 (966 deaths) represent 1.62% of the total number of deaths (59714) (INEC, 2009). The Ecuadorians who died by suicide during 2008 (929 deaths) represent 1.55% of the total number of deaths (60023) (INEC, 2008). The Ecuadorians who died by suicide during 2007 (1006 deaths) represent 1.73% of the total number of deaths (58016) (INEC, 2007). The Ecuadorians who died by suicide during 2006 (900 deaths) represent 1.55% of the total number of deaths in Ecuador (57940) (González-Andrade et al., 2011; INEC, 2006).

A descriptive analysis, a multiple correspondence analysis and a hierarchical classification were realized. The variables under study are: sex, age, marital status, area of residence, natural region, level of instruction, ethnic self-identification, pregnancy and types of suicide.

The descriptive analysis presents the percentages and the frequencies for the variables under investigation. The multiple correspondence analysis presents the differentiation criteria of the Ecuadorians who died by suicide and the hierarchical classification defines the clusters of the persons according to their common characteristics (Athanasiadis, 1995).
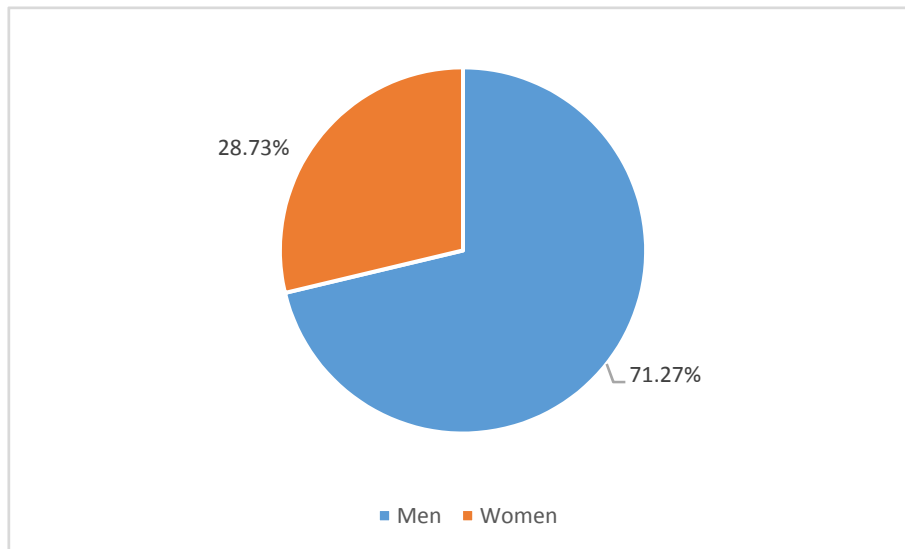
In the frame of this study, we used the statistical software SPAD v.4.5 offered by the Faculty of Humanities of the University of the Aegean.

2. The Descriptive Analysis

71.27% of the Ecuadorians who died by suicide during 2011 were men and 28.73% were women (Table 1, Graph 1).

Table 1. Sex

	n	%
Men	655	71.27%
Women	264	28.73%
Total	919	100.00%

Graph 1. Sex

Table 2. Age

	n	%
[10,20)	223	24.27%
[20,30)	300	32.64%
[30,40)	131	14.25%
[40,50)	97	10.55%
[50,60)	78	8.49%
[60,70)	53	5.77%
[70,80)	25	2.72%
[80,90)	12	1.31%
Total	919	100.00%

24.27% of them were young persons between the ages of 10 and 19 years, 32.64% were persons between the ages of 20 and 29 years, 14.25% were persons between the ages of 30 and 39 years, 10.55% were persons between the ages of 40 and 49 years, 8.49% were persons between the ages of 50 and 59 years, 5.77% were persons between the ages of 60 and 69 years, 2.72% were persons between the ages of 70 and 79 years and 1.31% were persons between the ages of 80 and 89 years (Table 2, Graph 2).
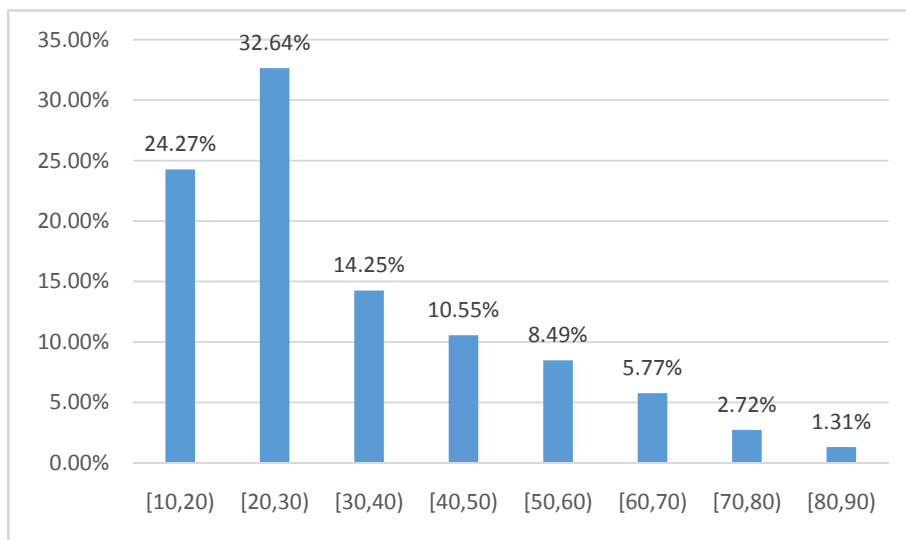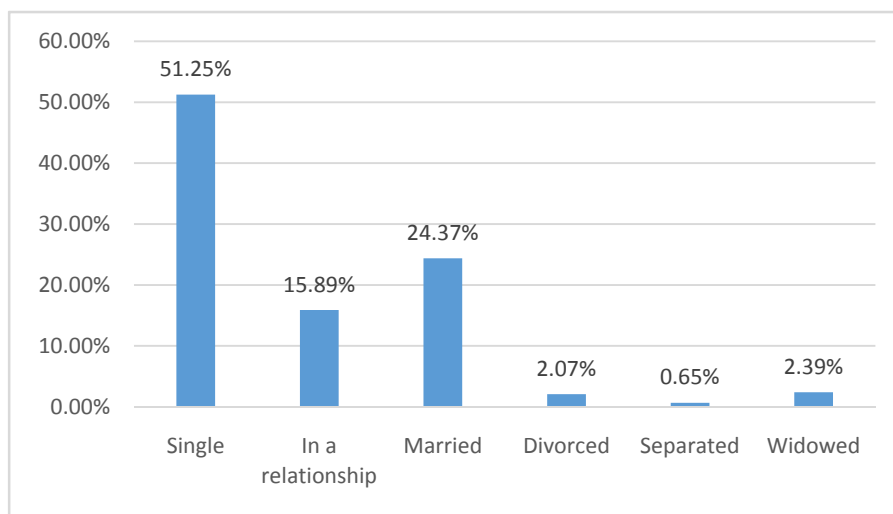
Graph 2. Age

Table 3. Marital status

	n	%
Single	471	51.25%
In a relationship	146	15.89%
Married	224	24.37%
Divorced	19	2.07%
Separated	6	0.65%
Widowed	22	2.39%
NA	31	3.37%
Total	919	100.00%

51.25% of these people were singles, 15.89% were in a relationship, 24.37% were married, 2.07% were divorced, 0.65% were separated and 2.39% were widowed (Table 3, Graph 3).
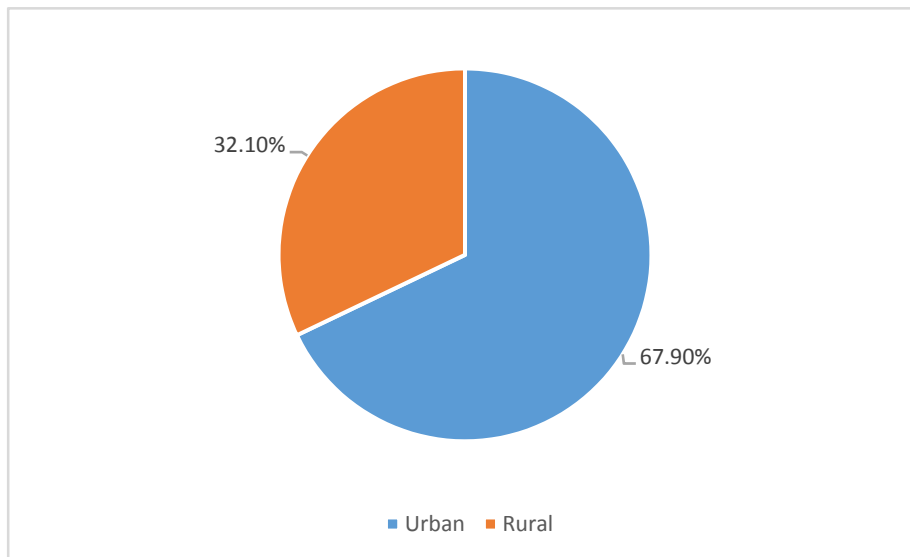

Graph 3. Marital status

Table 4. Area of residence

	n	%
Urban	624	67.90%
Rural	295	32.10%
Total	919	100.00%

67.90% of the Ecuadorians who died by suicide were living in urban areas and 32.10% were living in rural areas (Table 4, Graph 4).
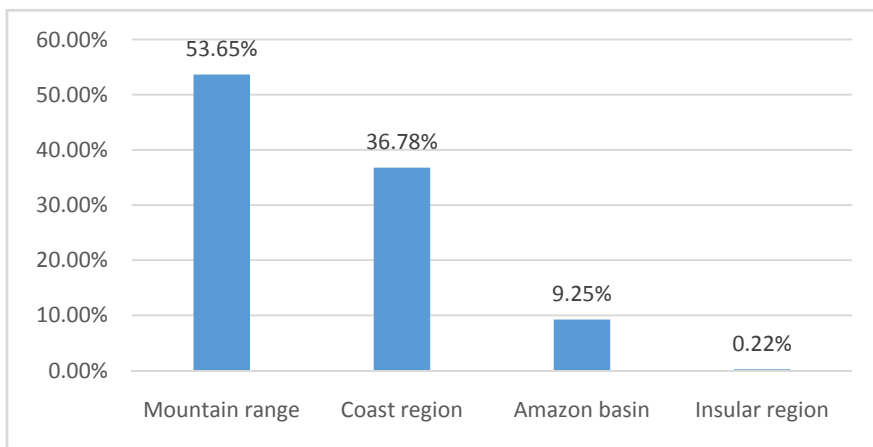
Graph 4. Area of residence

Table 5. Natural region

	n	%
Mountain range	493	53.65%
Coast region	338	36.78%
Amazon basin	85	9.25%
Insular region	2	0.22%
NA	1	0.11%
Total	919	100.00%

53.65% of these people were living in the mountain range of Ecuador, 36.78% in coast region, 9.25% in Amazon basin and 0.22% in insular region (Table 5, Graph 5).

Graph 5. Natural region

Table 6. Level of instruction

	n	%
None	70	7.62%
Literacy center	7	0.76%
Primary education	449	48.86%
Secondary education	284	30.90%
Basic education	18	1.96%
Middle education	4	0.44%
Cycle Post - Baccalaureate	5	0.54%
Higher education	35	3.81%
NA	47	5.11%
Total	919	100.00%

7.62% of the Ecuadorians who died by suicide during 2011 had not attended school, 0.76% had attended Literacy center, 48.86% Primary education, 30.90% Secondary education, 1.96% Basic education, 0.44% Middle education, 0.54% Cycle Post-Baccalaureate and 3.81% had attended Higher Education (Table 6, Graph 6) (Kalouri et al., 2011).
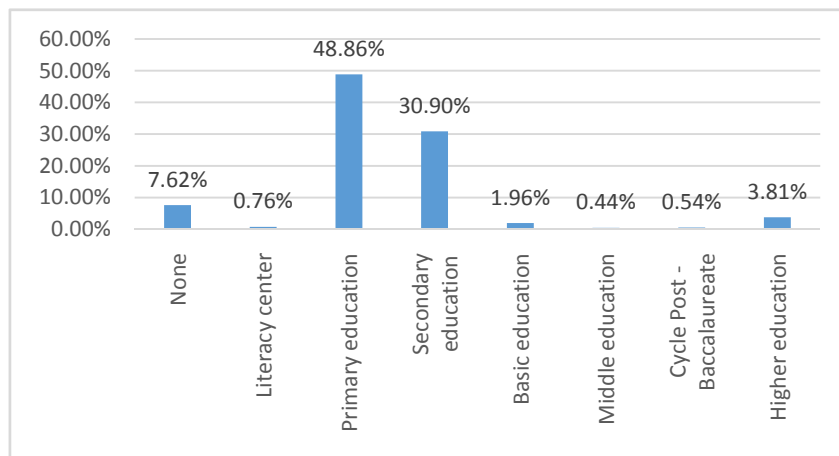

Graph 6. Level of instruction

Table 7. Ethnic self-identification

	n	%
Indigenous	102	11.10%
Afro-ecuadorian	20	2.18%
Black	219	23.83%
Mulatto	11	1.20%
Montubio	4	0.44%
Mestizo	483	52.56%
White	2	0.22%
Other	3	0.33%
NA	75	8.16%
Total	919	100.00%

11.10% of these people were indigenous, 2.18% afro-ecuadorians, 23.83% blacks, 1.20% mulattos, 0.44% montubios, 52.56% mestizos and 0.22% were whites (Table 7, Graph 7) (Stefos, 2015; Montenegro & Stephens, 2006).
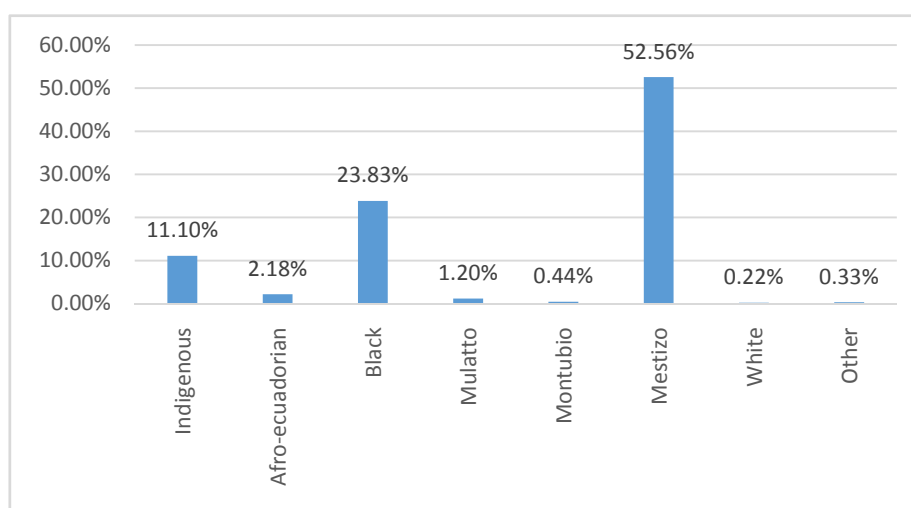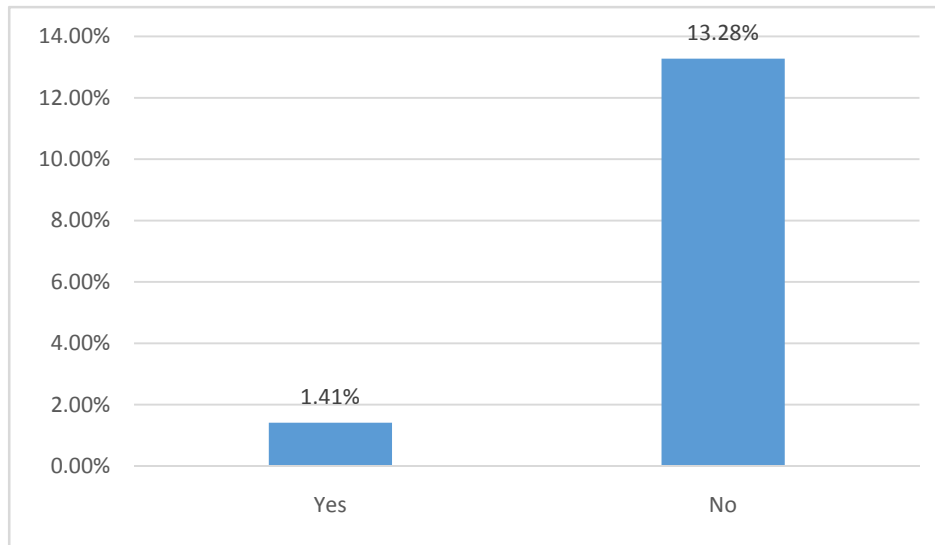

Graph 7. Ethnic self-identification

Table 8. Women who were pregnant when they died

	n	%
Yes	13	1.41%
No	122	13.28%
NA	784	85.31%
Total	919	100.00%

1.41% of the Ecuadorians who died by suicide during 2011 were pregnant women (Table 8, Graph 8).

Graph 8. Women who were pregnant when they died

Table 9. Types of suicide

	n	%
Intentional self-poisoning by and exposure to non-narcotic analgesics, antipyretics and antirheumatics.	2	0.22%
Intentional self-poisoning by and exposure to narcotics and psychodysleptics (hallucinogens).	1	0.11%
Intentional self-poisoning by and exposure to other drugs, medicaments and biological substances.	8	0.87%
Intentional self-poisoning by and exposure to alcohol.	18	1.96%
Intentional self-poisoning by and exposure to other gases and vapors.	1	0.11%
Intentional self-poisoning by and exposure to pesticides.	122	13.28%
Intentional self-poisoning by and exposure to other chemicals and noxious substances.	211	22.96%
Intentional self-inflicted injury by hanging, strangulation or suffocation.	481	52.34%
Intentional self-inflicted injury by rifle, shotgun and larger firearm.	1	0.11%
Intentional self-inflicted injury by other firearms.	48	5.22%
Intentional self-inflicted injury by smoke, fire and flames.	1	0.11%
Intentional self-inflicted injury by sharp object.	2	0.22%
Intentional self-inflicted injury by jumping from a high place.	2	0.22%
Intentional self-inflicted injury by unspecified means.	21	2.29%
Total	919	100.00%

0.22% of the Ecuadorians who died by suicide during 2011 died of exposure to non-narcotic analgesics, antipyretics and antirheumatics, 0.11% of exposure to narcotics and psychodysleptics (hallucinogens), 0.87% of exposure to other drugs, medicaments and biological substances, 1.96% of exposure to alcohol. 0.11% of exposure to other gases and vapors, 13.28% of exposure to pesticides, 22.96% of exposure to other chemicals and noxious substances, 52.34% died by hanging, strangulation or suffocation, 0.11% by rifle, shotgun and larger firearm, 5.22% by other firearms, 0.11% by smoke, fire and flames, 0.22% by sharp object, 0.22% by jumping from a high place and 2.29% by unspecified means (Table 9, Graph 9).
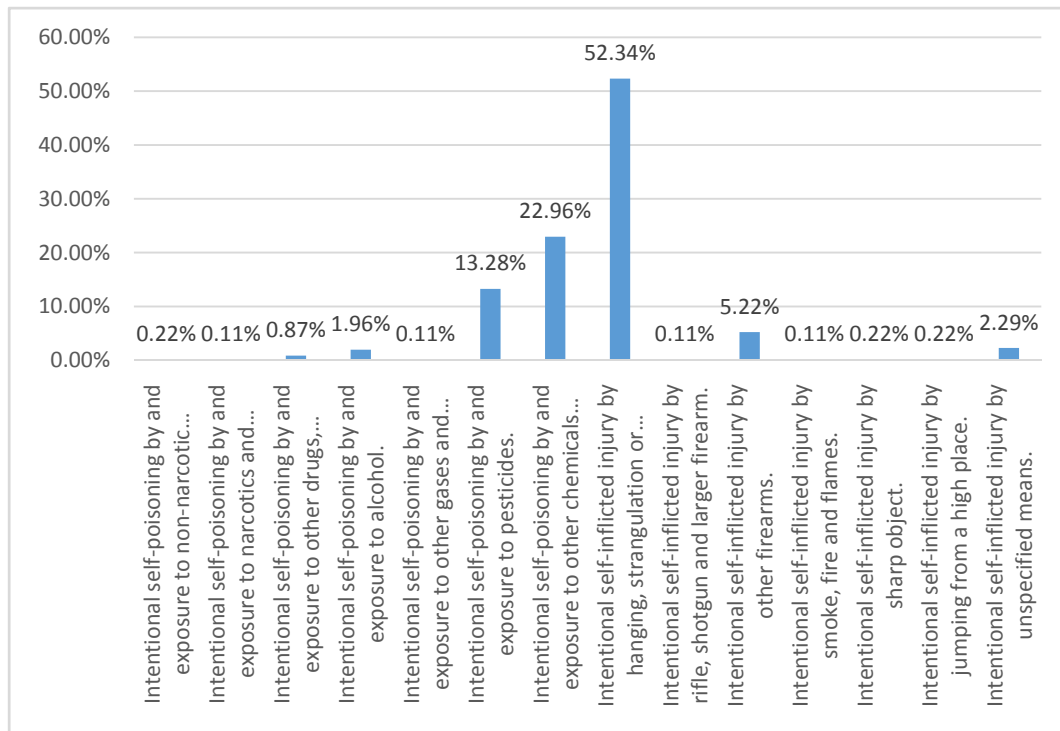
Graph 9. Types of suicide

3. The Multiple Correspondence Analysis

In the frame of this study, we used the multiple correspondence analysis that is based on the correlation of all the variables under study at the same time (Benzécri, 1992). The results set the three factorial axes which are the differentiation criteria of the Ecuadorians who died by suicide during 2011. The differentiation criteria correspond to the axes of the multiple correspondence analysis and they are presented in order of significance (Kampouropoulou et al., 2015).

First differentiation criterion (First factor axis, inertia percentage 7.96%)

The first differentiation criterion is consisted on one hand of men who were living in urban areas in coast region of Ecuador, they were older than 50 years of age, blacks, married or in a relationship and committed suicide using firearms. On the other hand, there are young women aged 10-19 years who were not pregnant when they died, singles who were living in rural areas of the mountain range of Ecuador or in Amazon basin and committed suicide using chemicals and noxious substances.

Second differentiation criterion (Second factor axis, inertia percentage 6.68%)

The second differentiation criterion is consisted on one hand of people who committed suicide by hanging, strangulation or suffocation, their level of instruction was Secondary education, they were singles, mestizos and they were living in urban areas. On the other hand, there are indigenous people who were living in rural areas of Amazon basin, they committed suicide using chemicals and noxious substances, had no attended school or their level of instruction was Primary education and they were older then 50 years of age.

Third differentiation criterion (Third factor axis, inertia percentage 5.39%)

The third differentiation criterion is consisted on one hand of people who were living in the mountain range of Ecuador, they were married and divorced and their level of instruction was Higher education. On the other hand, there are people who were living in the Coast region, they were in relationship, committed suicide using pesticides, they were blacks, women and separated.

4. The Hierarchical Classification

The method of hierarchical classification was used aiming to a classification of Ecuadorians who died by suicide during 2011 (Kampouropoulou et al., 2014). This method offers the advantage of representing the centroids of the clusters on the factor levels looking for a detailed interpretation of the differences between the groups (Martin, 2008). The hierarchical classification led to the formation of seven clusters which are presented in Figure 1 (Kampouropoulou et al., 2011).
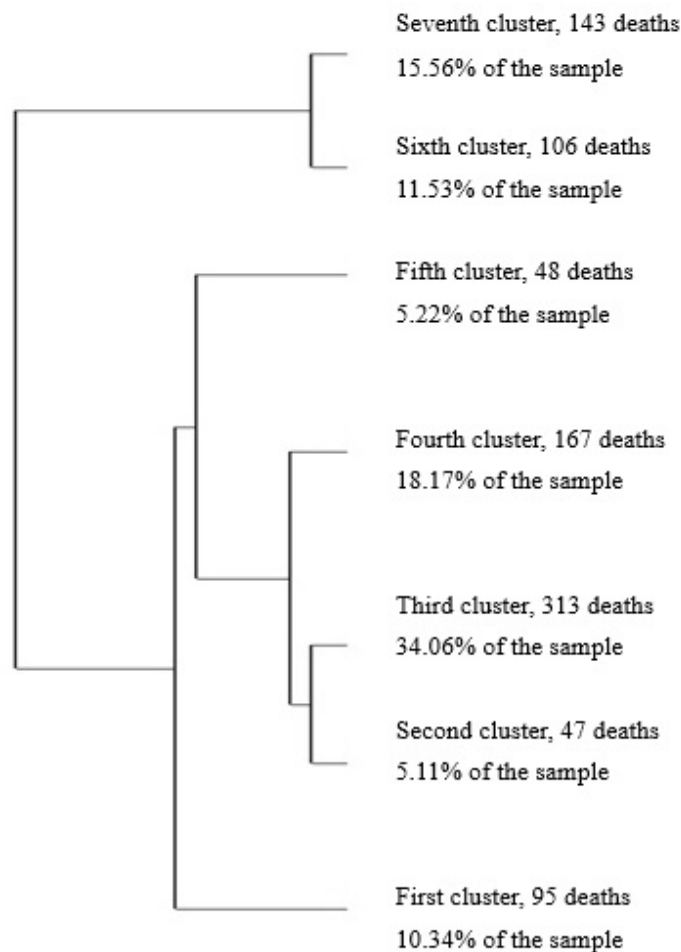

Seventh cluster, 143 deaths
15.56% of the sample

Sixth cluster, 106 deaths
11.53% of the sample

Fifth cluster, 48 deaths
5.22% of the sample

Fourth cluster, 167 deaths
18.17% of the sample

Third cluster, 313 deaths
34.06% of the sample

Second cluster, 47 deaths
5.11% of the sample

First cluster, 95 deaths
10.34% of the sample

Figure 1. The Hierarchical Classification

First cluster (95 deaths, 10.34% of the sample)

The first cluster consists of people who committed suicide by hanging, strangulation or suffocation, their level of instruction was Secondary education and they were singles.

Second cluster (47 deaths, 5.11% of the sample)

The second cluster consists of afro-ecuadorians who were living in Coast region and committed suicide with firearms.

Third cluster (313 deaths, 34.06% of the sample)

The third cluster consists of men aged 20-39 years who were mestizos and singles, their level of instruction was Secondary education and the majority of them committed suicide by hanging, strangulation or suffocation.

Fourth cluster (167 deaths, 18.17% of the sample)

The fourth cluster consists of married and divorced men aged 40-69 years whose level of instruction was Primary and Higher education and they were living in urban areas.

Fifth cluster (48 deaths, 5.22% of the sample)

The fifth cluster consists of widowed people older than 60 years of age who were living in Coast region.

Sixth cluster (106 deaths, 11.53% of the sample)

The sixth cluster consists of indigenous people who were living in rural areas of Amazon basin, they committed suicide using chemicals, noxious substances and pesticides and they had no attended school or their level of instruction was Primary education.

Seventh cluster (143 deaths, 15.56% of the sample)

The seventh cluster consists of young women aged 10-19 years, singles, who were living in the mountain range of Ecuador and their level of instruction was Secondary education.

These differentiations are presented in Figure 2 where the centroids of the seven clusters are presented on the level of the first two axes. The positions of the clusters regarding to the two axes present the differences and the similarities of the characteristics demonstrated in each cluster (Stefos et al., 2005).
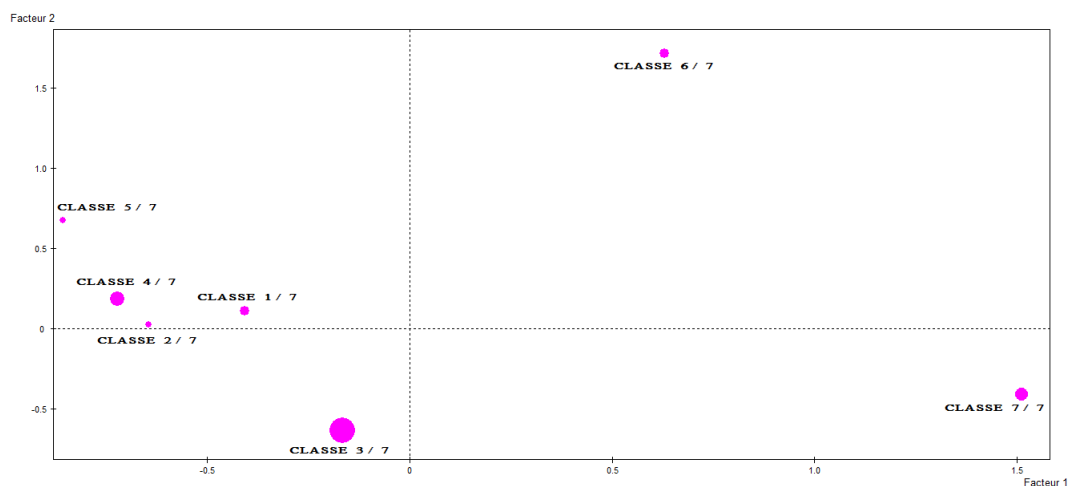

Figure 2. The Correspondence Analysis

5. Conclusion

The aim of the present study was to investigate the profile of Ecuadorians who died by suicide during 2011. We used the National Mortality Study of 2011 and investigated the variables: sex, age, marital status, area of residence, natural region, level of instruction, ethnic self-identification, pregnancy and types of suicide (Stefos & Papapostolou, 2013).

The results of the descriptive analysis are confirmed by the multiple correspondence analysis and the hierarchical classification (Morineau, 1984).

The analysis of the data showed that the majority (71.27%) of the Ecuadorians who died by suicide during 2011 were men.

71.16% were persons between the ages of 10 and 39 years. 51.25% were singles. The majority (67.90%) of the Ecuadorians who died by suicide were living in urban areas. 90.42% were living in the mountain range and coast region.

79.76% had attended Primary or Secondary education. 88.57% died by hanging, strangulation and suffocation or by exposure to pesticides, other chemicals and noxious substances (Stefos et al., 2011).

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