

# Investigation on quality of life and psychological well-being of citizens of L'Aquila after earthquake on April 6, 2009

## *Analisi sulla qualità della vita e benessere psicologico sui cittadini aquilani in seguito al terremoto del 6 aprile 2009*

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**SUMMARY. Purpose.** In April 2009 there was an earthquake in L'Aquila city. Several studies have shown that the citizens ability to react to a stressful situation is related to the satisfaction level of services during the reconstruction process of the city. The general aim of the present study is to investigate if the knowledge of information about the reconstruction phase has an influence on the satisfaction of the citizens, regarding the lifestyles and the capacity to adapt and respond to changes. **Materials and methods.** Five hundred and three residents in L'Aquila city were interviewed using a questionnaire that examines the satisfaction level, understanding of political issues and the resiliency skills of individuals. **Results.** The data show that the lack of information about the work of the facilities of by the Government has caused dissatisfaction among the citizens who feel that they have not been well informed about the rebuilding on the city. **Conclusion.** The study can represent an indication concerning the facilities and assistance provided by politicians and be understood as an input in order to improve the administrative system and public welfare.

**KEY WORDS:** satisfaction, quality of life, reconstruction, communication, political facilities.

**RIASSUNTO. Scopo.** Il 6 aprile 2009 un terremoto ha colpito la città di L'Aquila. L'abilità dei cittadini di reagire a una situazione stressante sembra correlata al livello di soddisfazione per i servizi offerti dal governo durante la fase di ricostruzione della città. Lo scopo generale dello studio è indagare sul livello delle conoscenze che i cittadini hanno acquisito riguardo alle informazioni rese dagli organi competenti sin dalle prime fasi dell'attività di ricostruzione con l'obiettivo di valutare come questo influenzi la loro qualità della vita e capacità di adattarsi ai cambiamenti che un evento di forte impatto emotivo come il terremoto possa provocare. **Materiali e metodi.** Per tale ragione abbiamo utilizzato un questionario, somministrato attraverso intervista telefonica, a 503 cittadini di L'Aquila, per misurare i livelli di soddisfazione sulla qualità della vita e comprensione delle decisioni e degli interventi messi in atto dai politici locali e regionali. **Risultati.** La comunicazione gioca un ruolo primario, in quanto la mancanza di informazioni chiare ed efficaci circa l'operato del governo crea uno stato di insoddisfazione sulla qualità della vita nei cittadini. **Conclusione.** Lo studio può rappresentare una sorta di indicatore sociale riguardo la necessità di meccanismi di comunicazione chiari ed efficaci circa l'operato dei responsabili della ricostruzione post-sisma che sembrano influenzare il livello di soddisfazione per la qualità della vita dei cittadini allo scopo di promuovere il loro benessere psicologico.

**PAROLE CHIAVE:** soddisfazione, qualità della vita, comunicazione, lavoro dei politici.

## INTRODUCTION

On Monday April 6, 2009, at 3:32 a.m., an earthquake of 6.3 magnitude on the Richter scale badly damaged the city of L'Aquila located in central Italy. The L'Aquila earthquake caused the death of 308 people, with more than 1000 injured and 66,000 displaced. The international literature proves that victims of natural disasters experience a strong physical and psychological distress<sup>1-3</sup>. There are considerable individual differences in subjective and psychological reactions to trau-

ma and many studies have shown that different coping strategies are important predictors of the outcome of this size and type of reactions<sup>4,5</sup>. There are scarce and inconsistent information about citizens satisfaction on quality of life and on offered services by the government during the city rebuilding process after a devastating earthquake or other natural disasters in the Italian population<sup>6</sup>.

In the international literature, there is little information about the positive influence that knowledge of information from the early stages of reconstruction processes may have

on the public, since, as demonstrated in other populations, this information could improve the skills of resilience and coping and thus the management problems in the emergency post-disaster<sup>7-9</sup>.

The recent studies show that citizens' effective participation in restoration and reconstruction after a disaster leads to the development of a better resilience capacity and management of the difficulties caused by an earthquake<sup>10</sup>.

The monitoring and the understanding of the reconstruction process after natural disasters is crucial to motivate citizens to recovery and to improve the perception that citizens have about quality of their life<sup>11</sup>. Quality of life (QOL) is defined by the World Health Organization (WHO) as "individuals' perceptions of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations. It is a broad-ranging concept incorporating in a complex way a person's physical health, psychological state, level of independence, social relationships, personal beliefs and relationships to salient features of the environment."

We felt that is important to monitor the satisfaction level on quality of life of people that live in L'Aquila after the earthquake and during the rebuilding process. Moreover, the understanding of the strategies implemented during the reconstruction process, through appropriate communication strategies from local government, allow citizens to manage the lifestyle changes caused by such a tragic situation better<sup>12</sup>.

In a situation like this it would be interesting to see how people, sensing the nearness of the representatives of various public and administrative institutions are able to monitor the different phases of the reconstruction process, and for this reason the citizens can feel involved in the planning strategies concerning the rebuilding of the city and surrounding<sup>13-17</sup>. The collection and data analysis about the reconstruction process may affect not only the local authorities, but could also have repercussions nationally and internationally providing new findings and implications about the best strategies to be implemented to allow a greater chance of recovery in the population affected by the earthquake<sup>15,18</sup>. After the L'Aquila earthquake the Central Government appointed a person in charge of the reconstruction (the current head of the Abruzzi Region), and a Deputy manager (the Mayor of L'Aquila). The emergency phase after the earthquake was managed by the Berlusconi administration and the National Civil Protection board. The most important solution implemented by the Berlusconi government immediately after the earthquake was represented by the building of several deployment so-called "New Towns" in and around L'Aquila. The "New Towns" are new districts with wooden dwellings (MAP - moduli abitativi provvisori) and small apartments made by the same material ("Progetto CASE" - complessi antisismici eco-compatibili), build according to seismic criteria.

The political organization dealt with the management of the following phases regarding the "New Towns". In addition to this, the role of head of Abruzzi Region and the Mayor of L'Aquila was also to monitor the rebuilding phases and to carry out a damage assessment of each individual dwelling, and also to monitor and evaluate the housing projects submitted by individual citizens.

However, despite the provisions of the specific organization implemented by the central government not all the re-

construction stages have been appropriately communicated to citizens. This situation has created a number of difficulties in understanding the objectives and results in the public work implemented by the Commissioner for the reconstruction. This has led to a general dissatisfaction that has caused a kind of general unease and disillusionment among the L'Aquila citizens that has consequently had an impact on their social well-being and health. Previous studies have shown that understanding the political management and trust in administrators generates a higher satisfaction level, well-being in the satisfaction of the citizens themselves and a greater ability to handle stress<sup>19</sup>. Understanding how government representatives manage the decisions that affect the citizens is important in general but it is even more so when of a population has been affected by a seismic event. The understanding mechanism needs resources and strength to handle the stress induced by the fear that the event may occur again, and in order to improve the ability of resilience and stress coping<sup>20</sup>.

The general aim of the present study is to investigate the satisfaction levels on quality of life of the citizens of L'Aquila relative to the work of the person in charge of the post-earthquake reconstruction and their degree of understanding regarding the work of the regional and local governments that have dealt with the reconstruction phases. It was also investigated whether the reconstruction efforts were supported by clear and effective communication mechanisms that allow citizens to become the more resilient.

## METHODS

### Participants

A sample of 503 residents in the city of L'Aquila were subjected to a questionnaire regarding: satisfaction levels with the quality of life, understanding of how the politicians managed the problems of the city and individuals' resilience. The socio-demographic characteristics of the sample are reported in Table 1.

With the help of regional bodies to select the sample we divided the city into three main areas: "Progetto case" area, MAP project areas and all the other areas excluded from the circuit of the "New Town" (Figure 1a-c and Figure 2). In reference the selected areas, the number of inhabitants displaced in different areas has been calculated as approximately 5000 people. On the basis of these data it results that 10% of the population resided respectively in the MAP project CASE project and in areas excluded from temporary accommodation.

### Procedure

Implementation process of collecting data via telephone interview represents an effective and immediate tool for finding information and opinions from a wide number of respondents. The interviews were carried out from November 2011 to July 2012 with an average of 20 interviews per week for a about 7-8 minutes on average for each interview. This method allowed to achieve a higher percentage of the chosen target with obvious advantages, such as a reduction in both time and costs and immediate recording of the information received in the application<sup>21</sup>.

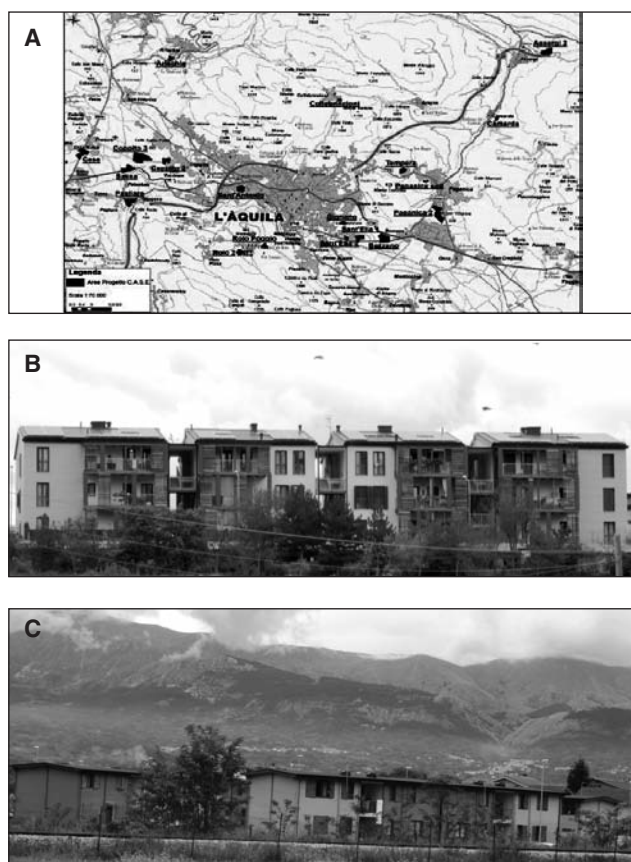
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Table 1. Socio-demographic characteristics in percentage frequency of the participants to the study

	Male	Female
N (%)	208 (41.4)	295 (58.6)
Age (mean and SD)	40.22 (13.36)	41.03 (13.97)
Years of education (mean and SD)	14.3 (2.35)	13.97 (2.24)
Marital status (%)		
Unmarried/maiden	96 (46.2)	126 (42.7)
Married	98 (47.1)	150 (51.5)
Separate	14 (6.7)	15 (5.2)
Jobs		
Employee	95 (45.7)	144 (41.1)
Student	32 (15.4)	56 (22.2)
Pensioner	14 (6.7)	16 (5.5)
Freelancer	51 (24.5)	35 (11.9)
Unemployed	9 (4.3)	31 (10.6)
Worker	7 (3.4)	2 (0.7)



Figure 2. Mapping of the areas used to occupy temporary housing units in the city of L'Aquila and the City of Lucoli (Province of L'Aquila).



Figures 1A. Map of L'Aquila; 1B. Pictures concerning the CASE Project; 1C Pictures concerning the CASE Project.

## Instruments

The questionnaire used for the telephone interview was realized from three other questionnaires used and realized previously by another study currently in press on a sample of 2000 people and used in international literature<sup>3</sup>. In particular, we used 10 items from assessment of quality of life questionnaire (VQV-ss)<sup>22</sup>; 3 items from Sense of Coherence Scale-Short Version<sup>23,24</sup>, and the 10 items from the questionnaire constructed in collaboration with the Abruzzi Region and, our questionnaire investigated, respectively, the satisfaction levels on quality of life, knowledge of the phases of the reconstruction process enacted by politicians and the comprehension skills and resilience strategies of the individuals themselves.

With regard to the levels of satisfaction we used 10 items, selected from the: Questionnaire on assessment of quality of life. (VQV-ss)<sup>22</sup>. The Questionnaire is a self-report, in each of which there are 4 possible semi-quantitative answers, referring to the degree of agreement to the statement. This questionnaire was designed for an application in the general population in subjects not affected by general medical conditions in psychiatric disorders manifested clinically. The items, therefore, have been formulated so as to capture the aspects of satisfaction and individual well-being, regardless of the general health of the subjects to be evaluated. The VQV-SS is distinguished from other tests because designed as a tool to investigate the QoL (Quality of Life) of the general population that disregards the presence or absence of disease, and aimed at a cultural target south-European type. The questionnaire allows us to distinguish different levels of satisfaction (individual, working and social levels) ( $\alpha$  of Cronbach's = 0.563).

To evaluate the ability of citizens to understand what is happening around them and give meaning to their lives selected 3 items were also selected from the Sense of Coherence Scale – Short version<sup>23,24</sup>.

An Italian version of Antonovsky's<sup>24</sup> 13-item short version of the Sense of Coherence Scale (SOC) was used to measure the respondent's comprehensibility, manageability, and meaningfulness. A 7-point Likert-type scale was used with responses ranging from

1 (very often) to 7 (very seldom or never). The SOC-scale specifically measured three protective factors: 1) the extent to which individuals are likely to perceive stressors as predictable and explicable (comprehensibility); 2) the extent to which they have confidence in their capacity to overcome the stressors (manageability); 3) the extent to which they judge it worthwhile to take on the challenge (meaningfulness) ( $\alpha$  of Cronbach's = 0.753).

Finally, to analyze the level of understanding and appreciation of the rebuilding committee board a questionnaire was created in collaboration with the Abruzzi Region. The survey has 10 questions to assess: the appreciation of the quality of facilities offered by the Commissioner of Reconstruction and the Mayor of the city; the work done by these people regarding the rebuilding of the city, the understanding, the perception of information relating to the interventions implemented from the earthquake till now, the level of trust the citizens have regarding the different autonomous city committees ( $\alpha$  of Cronbach's = .532). The questionnaire consists of 23 items.

### Statistical analysis

Statistical analyses were carried out using SPSS 16.0 for Windows. After calculating the Cronbach's of the individual items of the questionnaire extracted from the original scales, we proceeded to analyze of the frequencies and percentages for each of the items used. Finally, we conducted a correlation analysis, using the Spearman rank, among items related to satisfaction, politics and SOC.

## RESULTS

The socio-demographic details of the sample are well reported in Table 1. We conducted a frequency analysis on the results obtained in each item of the three questionnaires.

As regards to the items of questionnaire that measures the QoL satisfaction levels about quality of life, the following results were obtained: in the item regarding the question "Do you consider that the overall balance of your of life is satisfactory?" (Figure 3a) the citizens showed an adequate level of satisfaction by declaring pretty and very satisfied to the extent respectively of 62.6% and 26%. Similarly 52.3% of people said to be quite satisfied with their current economic situation (Figure 3b). For the question concerning the satisfaction of social relations 62.4% of citizens claim to be fairly esteemed, only 27.6% say they are greatly respected by people around them (Figure 3c).

Three years after the earthquake most people interviewed have a positive view of their lives. In fact only 21.9 % of interviewees, negatively answered the question: "Has your outlook on life become more negative regarding your life after the earthquake?" (Figure 3d). That result is confirmed by 52.3% of respondents declaring that they identified the ability and willingness to plan their lives, when they have sufficient resources (Figure 3e).

Regarding the changes in lifestyle after the earthquake, most people (77.9%) said their lives have fairly (44.3%) or greatly changed (33.6%) (Figure 3f). With regard to employment, 16.3% of the population are considered satisfied, and 39.2% of the public feeling quite satisfied (Figure 3g). Similarly, 50.3% of the population claim to be very or fairly satisfied concerning the way their free time activities (Figure

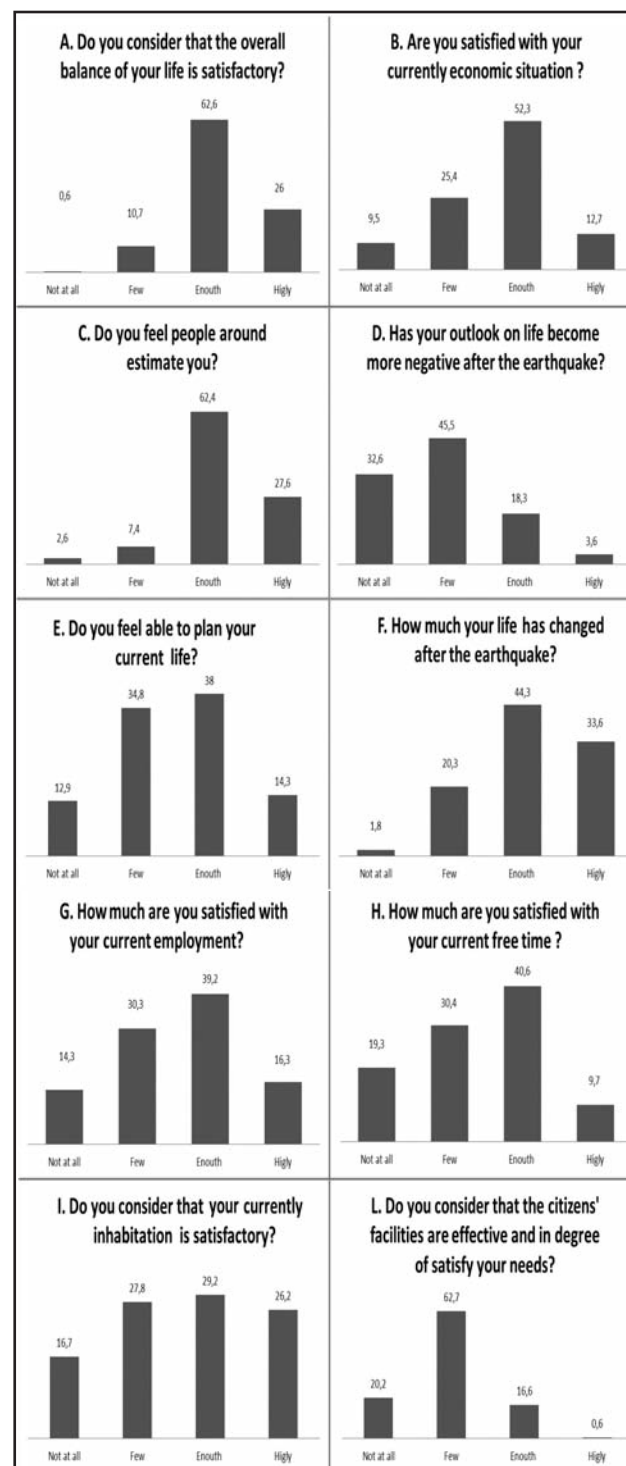


Figure 3. Percentages of the people interviewed in the satisfaction items.

3h). Compared to satisfaction with their current home, 44.5% of the population surveyed said they were not satisfied (Figure 3i). The highest percentage of dissatisfaction that

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the citizens have given regarded the quality of facilities offered by the government; 82.9% of them consider them to be unavailable or ineffective (Figure 3l).

Regarding the SOC questionnaire, relating to the way in which people perceive life and the resilience capacity in stressful situations, the results show that 57.3% of respondents claim to have no difficulty in understanding what has happened to them (Figure 4a).

Regarding the data obtained in relation to the meaning that the citizens have of their lives, only 22% of the respondents claim that they are unable to overcome the difficulties in their lives (Figure 4b). Similarly, only 23.7% of respondents said they feel that everyday difficulties cannot be overcome (Figure 4c). The results obtained from three SOC items have shown that, even if there is a stressful situation for L'Aquila citizens, they show a good resilience capacity.

In the political section of the questionnaire the results show that 52% of citizens appreciate the work done by the Commissioner for the reconstruction (Figure 5a).

In contrast, to the analogous question of how citizens evaluate the work done by the Mayor of the city, the surveyed population negatively evaluated the work of the Mayor (63%) (despite this, the Mayor was re-elected in May 2012) (Figure 5b). According to the majority of the citizens, the priorities which the Head in charge of the reconstruction are not only the reconstruction and employment, but also (56.9%) in the social activities (Figure 5c).

Regarding the information level received from the Commissioner for the reconstruction about the organization of services given to the citizens, the results show that 57% of respondents think they have been misinformed (Figure 5d). On the contrary, regarding the level of information received by the Mayor of the city about the organization of direct service-

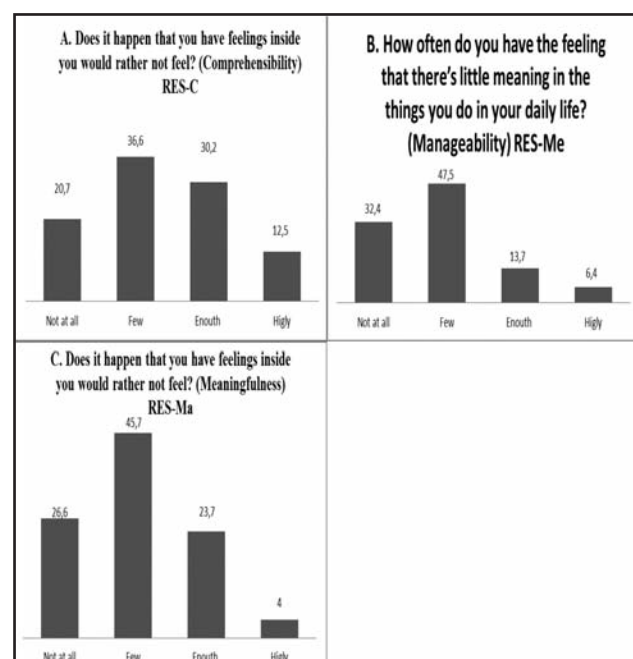


Figure 4. Percentages of the participants response in the SOC items.

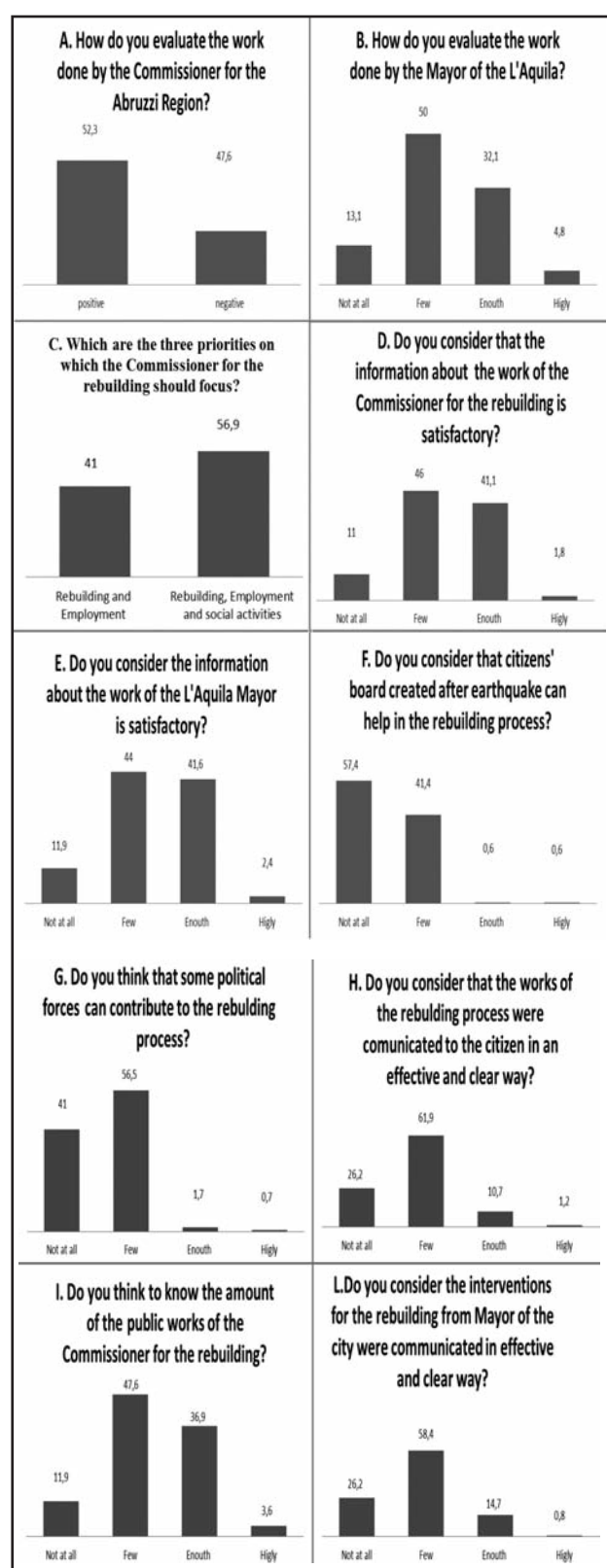


Figure 5. Percentages of the participants response in the political items.

es to citizens, 41.6% of respondents claimed to have been quite well informed and 44% badly informed (Figure 5e). The general spread unease after the earthquake resulted in the founding of a significant number of citizens' autonomous committees, claiming to represent holders of citizens' needs. According to data, the majority of the population (57.4%), did not believe in the work of this groups (Figure 5f).

Most citizens also believe that no political force could provide a significant contribution to the rebuilding process (41%) or only a little contribution (56.5%) (Figure 5g). Regarding the information level received from the Commissioner for the reconstruction and the Mayor of L'Aquila about the public works, the people claim to have been almost totally kept in the dark concerning in their decisions on the rebuilding process. The citizens consider the communication between them and serves the public authorities to be unclear and ineffective (Figure 5h-l).

### Correlation analysis

Finally, we conducted a correlation analysis, using the Spearman rank, among items related to satisfaction, politics and SOC.

The results revealed that the item related to the work of the Commissioner for the rebuilding is significantly correlated with the three SOC items regarding the way in which the people perceive their lives and to how they use their resilience capacity in stressful situations: item 1 of SOC (comprehensibility) ( $r=.197$ ,  $p<0.01$ ); item 2 of SOC (manageability) ( $r=.129$ ;  $p<0.01$ ) and item 3 (meaningfulness) ( $r=.238$ ,  $p<0.01$ ). Furthermore, the item related to the work of the Commissioner for the rebuilding is inversely correlated with the feeling of the citizens have of not being able to control daily events ( $r=-.293$ ,  $p<0.01$ ).

### DISCUSSION

The present study has investigated the satisfaction level of the L'Aquila citizens for both the quality of their lives in relation to changes related to the earthquake of 6 April 2009 and the work of local and regional bodies for the post-rebuilding phases.

Conducting a study on a population affected by an earthquake, is of great importance in relation to the fact that the satisfaction levels of citizens are an index of the correctness of the works of the local and regional organization responsible for the post-rebuilding phases. It is directly reflected on the psychological resilience of the citizens themselves. The highest dissatisfaction degree among citizens has emerged concerning the urban facilities offered by the committed responsible for the rebuilding, defined by population as totally inefficient and not easily accessible. Moreover, the citizens show a lack of confidence regarding the work of the Mayor and the citizens' committee that only create confusion. Therefore, the dissatisfaction for these aspects has generated a "local inertia" in the population, and has led to a collective distrust and dissatisfaction<sup>25</sup>. However, despite this general dissatisfaction with the current situation three years after the earthquake, people show a good ability to manage, understand and plan their lives. This result could be explained by

the fact that the discomfort and discontent of citizens seems to be due more to external factors, such as the quality of facilities provided to citizens by public administrations, than to internal factors.

Some epidemiological studies have produced a series of clinical knowledge about traumatic experiences after different types of natural disasters<sup>26</sup>, concluding that many years after the traumatic event, the population shows an increase in perceived stress and psychological illnesses related to the poor understanding of what happened around them<sup>1,5</sup>.

Yanar<sup>27</sup> in the 1994, has shown that residential satisfaction is directly related to topics such as the desires and expectations of the individual, how they perceive the physical environment, how these perceptions influence their behaviors, the adaptation of the individual to the residence and its environment or change in the residence and the environment because of inadaptability, choice of residence, standards of the residence, user requirements, the quality of the environment and the life and habitability of the residence.

Ukoha and Beamish<sup>28</sup> claimed the necessity for the change in the public regulations and methods of control related to residential practices and the requirement for good quality structures, after a natural disaster.

Data obtained from our study allows us to reflect on an same important aspects: regardless of whether or not there is satisfaction for the facilities provided by those responsible for post-earthquake rebuilding, the citizens complain about the lack of a clear and effective communication as a tool for participation and sharing. This result shows that citizens have felt excluded from the rebuilding process because they have not been adequately informed about the choices to be implemented. The distance that this lack of communication has created between citizens and politicians has created a climate of general dissatisfaction. Despite this, the ability of citizens to think, understand and plan their lives allows them to have hope for the future. However, in spite of the situational distress that these people live and the confusion over the various decisions of politicians regarding the city and their lives, the residents in L'Aquila feel satisfied with their life in general, the work they do, and how to spend their free time. They do not have a negative view of things and their lives, and do not lack hope in the future. The discomfort and the inability to recover a general well-being are certainly due to the management of the facilities offered locally and at the same time to the total absence of information that proves to be ineffective<sup>29</sup>.

Several studies on community resilience have demonstrated that the feeling of control of socio-political size<sup>30</sup> is configured as an effective mediator of the adverse effects associated with deprivation linked to socioeconomic status. The consequences of our study are very important in promoting resilience in a community by means of an active participation and the development of their knowledge, skills, values and culture. In this way the citizens can improve their coping strategies and adapt to different dramatic situations<sup>31</sup>. This study, first of all allows us to have a real estimation of the satisfaction level of citizens about the management of the government in the rebuilding phases three years after the devastating earthquake. Our results are important because we feel, like other authors, that active participation in decision making regarding the rebuilding phases and clear and adequate information can improve the satisfaction level on the quality of life in the population<sup>3</sup>.

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The political system is a reference point for the people, because when its actions do not meet the needs of citizens, the satisfaction level of the quality of their lives changes, and especially there is the perception of not possessing internal resources.

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