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# Perception of stress in aging: the role of environmental variables and appraisal of the life experiences on psychological stress

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ABSTRACT

*Background:* Psychological stress plays a pivotal role in individual well-being in aging. Environmental and psychological variables influence the stress responses of older adults. This study investigated the impact of some sociodemographic and appraisal of the life experiences on perceived stress.
*Method:* 300 older adults participated in the study. A measure of psychological stress and a questionnaire assessing the appraisal of life events and beliefs on the experience to be an older person were used.
*Results:* Females reported higher levels of stress. Moreover, the participants who lived in a rural area were more stressed than those who lived in an urban area. Beliefs on aging and condition of life affected perceived stress more than physical and objective variables.
*Limitation:* The study has several limitations. The data were self-reported, and the design of the study was cross-sectional. Moreover, a convenience sample was used.
*Conclusions:* This study showed that appraisal that old persons have of their life influences perceived stress. Well-being in aging is a complex goal and involves socio-emotional adjustment. Findings permit to hypothesize that encouraging independence is the base for enhancing the well-being of the older person. Older people must have the resources they need to deal with the challenges they face, to achieve a sense of purpose and control in their lives. This issues could be critical when planning the organization of services for older adults. These services should not just aim to maintain physical health but should also take into account the psychological needs of older people.

## 1. Introduction

Aging is a process characterized by structural and functional changes in different organs. It involves a progressive reduction of the homeostatic capacity of the organism with possible negative consequences on the state of health and quality of life. De Grey (1999) defined aging as deteriorative changes with time during post-maturational life. It underlies an increasing vulnerability to challenges, thereby decreasing the ability of the organism to survive. However, it is not a disease (e.g., Aubert & Lansdorp, 2008; Csermely & Sőti, 2006).

For this reason, it is difficult to pinpoint the moment in which aging begins, and analyze the numerous variables influencing on its evolution. The same definition of "old" person is not universal in the literature. Some studies on aging include subjects in their 50 s, while others consider people who are 60 or 65 to be old (e.g., Lindley, 1989). Most developed countries have accepted the chronological age of 65 years as a definition of an older person (Baernholdt, Hinton, Yan, Rose, & Mattos, 2012).

Physiological and cognitive changes increase rapidly for middle-aged adults aged 50 to 65 years (Lezak, Howieson, Bigler, & Trane, 2015). Although some skills, such as memory and attention (2016b, Commodari, 2016b; Craick, 1991; Hultch & Dixon, 1990;), decay from this period of life, other cognitive and behavioral functions maintain their efficiency.

Several environmental variables, such as health conditions, education, and social status, influence the quality of aging (Baxter et al., 1988; Raggi et al., 2016). Research also showed that exposure to particularly stressful environmental events and individual history have important repercussions on wellbeing in old age. Psychological stress can have, in fact, extreme adverse consequences on health (Hasan, Rahman, Arif, & Sobhani, 2012). In this regard, McEwen and Seeman (1999) highlighted that it is not so much the dramatic events that cause adverse effects on health, but rather the number of events in everyday daily life that elevate activities of physiological systems to produce some measure of wear and tear.

The relationship between psychosocial stressors and disease is

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affected by the nature, number, and persistence of the stressors as well as by the individual's biological vulnerability (i.e., genetics, constitutional factors), psychosocial resources, and learned patterns of coping (Schneiderman, Ironson, & Siegel, 2005). Inadequate social support, for example, is a significant predictor of stress in patients with HIV infection (Vedhara & Nott, 1986), women with postpartum depression (Corrigan, Kwasky, & Groh, 2015) and patients with cancer (Hann, Oxman, Ahles, Furstenberg, & Stuke, 1995). Also, living in rural or urban areas influences the aging process and exposes old people to different levels of potentially stressful events.

As regards the last point, the results of studies on people who live in different environmental and social contexts are controversial. Some studies found that physical and mental health is poorer in the rural population than in the urban one and gets worse as we age. Other studies did not report any difference between rural and urban residents (Cleary & Howell, 2006; Laditka, Laditka, Olatosi, & Elder, 2007; Oguzurk, 2008). However, emotional well-being and social status are worse in rural older people than in their urban counterparts (Kirk & Alessi, 2002). In this regard, a recent study on the quality of life in rural and urban adults aged 65 years and older (Baernholdt et al., 2012) hypothesized that lower scores of social functioning in rural areas suggest that rural older adults may be socially more isolated then their peers that live in an urban area. Moreover, they may need social and healthcare programs to maintain physical and mental health.

Individual differences in the aging process can be conceptualized as an accumulation of wear and tear caused by daily experiences and major life stressors that interact with both the genetic constitution and predisposing early life experiences (Lavretsky & Newhouse, 2012). The old age is often coincident with significant changes in individual lifestyle and the occurrence of events, such as retirement, losses, or medium-severity diseases that significantly influence daily routines. These events can favor the development of emotional disorders, with difficulties in coping with daily events, even in the absence of pathological conditions.

Blake (2001) highlighted that a lot of stressful events occur as a part of aging. Although the majority of older adults seem to tolerate these events fairly well, stress is an even more important predictor of depression in older adults than genetic factors (Blake, 2001). Moreover, negative self-perception of aging has been linked to poor physical health and functioning outcomes in later life, while a more positive self-perception of aging may be protective of decline in physical functioning (Robertson, King-Kallimanis, & Kenny, 2016; Sargent-Cox, Anstey, & Luszcz, 2012). In this regards, research on centenarians has shown that people who are one hundred and more years old present low levels of depression and high levels of extroversion (Baek, Martin, Siegler, Davey, & Poon, 2016). Moreover, several studies have shown that stereotypes on aging influence mental, physical, social, and emotional well-being of older people and ultimately the length and quality of their life (Dionigi, 2015).

It is not linear and easy to define how stressful events influence health and quality of life. Moreover, a stressful event does not often allow straightforward identification. The individual reaction to stress, in fact, is not directly related to the exposure to stressors but emotional responses instead mediate it.

According to the bio-psycho-social model of stress (Blascovich, Mendes, Hunter, Lickel, & Kowai-Bel, 2001; Lemyre, Tessier, & Fillon, 1990), the level of stress does not depend on the characteristics of an event, but on the appraisal of the situation mediates it. This model is the prevailing theoretical framework linking cognitive, physiological, and behavioral responses to the performance of stress in adults. It hypothesizes that while an acute stressor is active, individuals appraise the situation, evaluating their resources against the demands of the situation (Blascovich, Mendes, Hunter, & Salomon, 1999; Folkman, Lazarus, Gruen, & De Longis, 1986). This initial appraisal shapes the physiological response to the stressor, which then influences the individual performance (Blascovich et al., 1999; Mendes, Major, McCoy, & Blascovich, 2008). Once the situation is resolved, these factors together shape a post-task stress appraisal that incorporates perceptions of the degree to which the situation was stressful (Quigley, Barrett, & Weinstein, 2002; Rith-Najarian, McLaughlin, Sheridan, & Nock, 2014).

From this point of view, psychological stress is the state of tension, preoccupation, and agitation that develops when a person perceives the environmental request as demanding or exceeding his or her resources and imperiling his or her well-being (Lemyre et al., 1990). In this regard, Kanner, Coyne, Schaefer, and Lazarus (1981) evidenced that the assessment of daily hassles and uplifts may be a better approach to the prediction of adaptational outcomes than the usual life events approach. Psychological stress is not a psychopathological disease. It concerns physical and behavioral signs within the range of functional integrity. Stress-induced disorders occur as a result of stress when it is of high intensity or long duration or when other pathogenic processes are also present.

## 2. Research aims

Previous findings indicate that stress influences physical, psychological, and behavioral responses (e.g., Schneiderman et al., 2005). The present study aimed to investigate psychological stress in older people. The overall goal of the study was to examine the impact of socio-demographic variables and psychological variables, such as the appraisal of the personal experience to be an old person, on psychological stress.

Several studies analyzed the effects of stress on aging, but the majority of those focused on physical variables producing stress or psychological damage connected to stress. Different from the previous studies, the present research aimed to investigate the perception of stress and the personal variables that influence the individual's feelings of “being under pressure."

## 3. Materials and methods

### 3.1. Participants

300 adult aged 65–83 (mean age = 73.38; *SD* = 4.36; 150 males, 150 females), who lived in semi-rural and urban areas of southern Italy, participated in the study. All the participants were in apparent good health.

One hundred fifty participants lived in a town, 150 lived in a village. The town had about 40,000 residents. It was near a large city and offered several services for old people, such as recreational activities and university for the third age. The village was an agricultural center of about 5000 residents. It offered neither specific services nor recreational activities for old people. The choice to enroll participants who lived in a town and in a village depended on the purpose to measure perceived stress in old people who lived in localities with different cultural and economic contexts. In each locality, participants were recruited near the main church and the most popular supermarket. The choice to hire people in a church and supermarket depended on the fact that old people broadly frequented these places, and in those places, old people spent much of their free times.

### 3.2. Procedures

A trained psychologist contacted all the people who entered the largest church in the area to attend Mass on Sunday morning, and all the people who were at the entrance of the more popular supermarket, on a weekday morning. All the persons more than 65 years were invited to participate in the study. Three hundred seventy people accepted the invitation. Out of these, 45 who reported being suffering from severe or chronic diseases were excluded from the study. Twenty-five other people were excluded after the preliminary administration of the Mini-Mental State Examination (Folstein, Folstein, & McHugh, 1975). This test was administered to all the participants to avoid participation in

the study of those who presented significant cognitive deficit. The research conformed to the Helsinki Declaration outlining the principles for research involving human subjects. All participants provided informed consent. They acknowledged that they could not be identified via the paper. The study followed Ethical Code for Italian psychologists (L. 18.02.1989, n. 56), Italian law for data privacy (DLGS 196/2003), and Ethical Code for Psychological Research (March 27, 2015) approved by Italian Psychologists Association.

### 3.3. Measures

The research was conducted by using two measures. The first, the "Psychological Stress Measure," evaluated psychological stress; the other one was a questionnaire that collected some socio-demographic information and assessed how a person evaluated previous life experiences and his or her life experience in old age.

The "Psychological Stress Measure" (PSM Lemyre et al., 1990; Italian adjustment: Di Nuovo, Rispoli, & Genta, 2000) focused on psychological stress. Psychological stress is not a pathological response unless it becomes chronic. It is a complex response of an individual to environmental requests. According to the authors, each person responds to stressors differently. Furthermore, attempts activated to handle tension were distinctive and of differential grades in different subjects, even in response to the same stressor stimulus.

Unlike the majority of the measures of stress, which were developed for psychiatric or clinical populations, PSM aims to measure perceived stress in the general population. Moreover, it does not use an inferential method to assess stress, but it focuses on the individual perception of the psychological status to feel "under pressure" (Brazil & Krueger, 2002). PSM consists of 49 items. The items focus on the individual feeling about one's cognitive, physiological, and behavioral state (e.g., "I'm worried about what can happen the next day"). The score ranges from 49 to 196.

PSM has good psychometric properties (Internal consistency – alpha Cronbach coefficient: .95; test-retest reliability between .68 – .80). Different language PSM versions were developed (e.g., English, Japanese, and Italian versions). All the versions of this test maintain the heuristic statistics, the normality of distribution and responsiveness of the original version (Lemyre and Tessier, 2008).

The second measure was a questionnaire that collected socio-demographic information and assessed how older people perceived their previous life experiences and their status of an old person. The questionnaire consisted of two parts. The first part collected some socio-demographic information (i.e., age, gender, education, area in which the person lived, the status of employment, marital status, and size of household). The second part was a seven-point Likert-type scale. It comprised 17 items that checked how the old persons evaluated their life experiences. The scale assessed several factors that influence well-being (e.g., ability to cope with everyday problems, working skills, leisure activities, the satisfaction of previous and present life, and expectancy for future, mood). The participants had to indicate how much each item was right for them (one: completely false; seven: completely true).

## 4. Results

Firstly, several *t* tests and ANOVA analyses by socio-demographic variables were calculated (age, gender, education, employment, the presence of disturbs typical of aging, e.g., high blood pressure, area in which the person lives, urban or rural, size of the household, employment, marital status). Secondly, the correlations between the PSM scores and the response to the 17 items of the Likert-type scale were measured. Based on correlation analysis, a hierarchical regression analysis using the MSP scores as the dependent variable and the responses to some items of the Likert- type scale was calculated. This analysis aimed to explore the contribution of the socio-demographic variables and the impact of old people's feelings on psychological stress. Mainly, the goal of the regression analysis was to evaluate how well the sets of independent variables were able to predict psychological stress, and which of these variables was the best predictor of PSM scores.

**Table 1**
Socio-demographic distribution of the participants.

| | | N = 300 | % |
|---|---|---|---|
| Gender | | | |
| | Men | 150 | 50% |
| | Women | 150 | 50% |
| Level of education | | | |
| | Primary school | 90 | 30% |
| | Secondary school | 75 | 25% |
| | High secondary school or university degree | 135 | 45% |
| Marital status | | | |
| | Single | 29 | 9.7% |
| | Married | 187 | 62.3% |
| | widower | 84 | 28% |
| Place of stay | | | |
| | Urban | 150 | 50% |
| | Rural | 150 | 50% |
| Status of employment | | | |
| | Self-employed | 78 | 26% |
| | Housewife or person who never engaged paid work | 117 | 39% |
| | Retired | 92 | 30.7% |
| | Volunteer | 13 | 4.3% |
| Size of the household | | | |
| | 1 | 67 | 22.3% |
| | 2 | 130 | 43.3% |
| | 3 | 39 | 13.0% |
| | 4 | 23 | 7.7% |
| | 5 | 20 | 6.7% |
| | 6 | 15 | 5.0% |
| | 7 | 6 | 2.0% |

### 4.1. Perceived stress by socio-demographic variables; t test and ANOVA analyses

Table 1 presents the socio-demographic characteristics of the participants. Table 2 presents mean scores, standard deviation, *t* test and ANOVA values by socio-demographic variables.

#### 4.1.1. Gender

The results showed that males and females differed in the perception of stress (males: $M = 84.14$, $SD = 10.05$; females: $M = 95.00$, $DS = 9.41$, $t = -9.65$, $p < .001$). The comparison of this result with the Italian norms showed that the perceived stress in our sample is within the normal range (Di Nuovo et al., 2000) The means values of the normative samples are $M = 89.01$ ($DS$: 23.50) for males, and $M = 91.85$ ($DS$: 23.40) for females.

#### 4.1.2. Area in which the person lives

The results showed the participants who lived in a rural area presented higher perception of stress than those who lived in an urban area (PSM scores: rural area: $M = 91.84$, $SD = 9.24$; urban area: $M = 87.30$, $SD = 12.37$, $t = -3.59$, $p < .001$). The participants who lived in the area that offered more services for the residents presented a lower level of psychological stress than the participants who lived in the rural area.

#### 4.1.3. Grade of education

The participants were divided into three groups according to their grade of education (group 1: primary school degree; group 2: junior high school degree; 3 group: high school or university degree). ANOVA

**Table 2**
Descriptive analyses of the PSM scores, and *t* test and ANOVA values by the socio-demographic variables.

| PSM | *M* (*SD*) | *t* | *p* |
|---|---|---|---|
| *Gender* | | | |
| Males | 84.10 (10.05) | −9.65* | < 001 |
| Females | 85.00 (9.40) | | |
| *Health* | | | |
| No disturbs typical of age | 89.12 (10.93) | −72 | .46 |
| Presence of disturbs typical of age | 90.06 (11.36) | | |
| *Area in which the old person lived* | | | |
| Urban | 87.03 (12.37) | −3.59* | < 001 |
| Rural | 91.84 (9.23) | | |
| *Marital status* | | | |
| Single | 89.05 (9.18) | 1.17 | .31 |
| Married | 88.94 (11.86) | | |
| Widower | 91.15 (9.98) | | |
| *Grade of dducation* | | | |
| Primary school | 98.53 (7.53) | 88.63* | < 001 |
| Junior high school | 91.25 (7.30) | | |
| High school or university degree | 82.67 (10.30) | | |
| *Status of employment* | | | |
| Self-employed | 88.14 (9.55) | 33.48* | < 001 |
| Housewife or persons who newer engaged paid work | 96.17 (9.90) | | |
| Retired | 83.34 (9.84) | | |
| Volunteer | 82. 92 (6.17) | | |
| *Size of the household* | | | |
| 1 | 90.44 (10.07) | .46 | .81 |
| 2 | 89.78 (11.93) | | |
| 3 | 88.17 (11.71) | | |
| 4 | 88.69 (9.769 | | |
| 5 | 89.35 (8.96) | | |
| 6 | 91.33 (8.99) | | |
| 7 | 84.16 (18.34) | | |

*Sig. $p < .001$.

analysis showed that less educated participants presented higher level of stress compared to the most educated participants (PSM scores: primary school: $M = 98.53$, $SD = 7.53$; junior high school: $M = 91.25$, $SD = 7.30$; high school and university degree; $M = 82.67$; $SD = 10.29$; $F = 88.86$, $p < .001$). High education showed to be a protective factor from stress in aging.

#### 4.1.4. Status of employment

The sample was divided into four groups. The first group comprised the people in gainful employment. The second group comprised the housewives and the persons who never had a remunerated work in their life ($N = 117$). The third group comprised the people who were retired ($N = 92$). The fourth group included the participants who were retired but at the same time, were involved in voluntary activities or social services ($N = 13$). ANOVA analysis ($F = 33.52$, $p < .001$) showed that the most stressed participants were the housewives and the people who were never in gainful employment in their lives (PSM scores: $M = 96.17$, $SD = 9.90$). The lower level of stress was reported by the people who were retired but were involved in some voluntary activities (PSM scores: $M = 82.92$, $SD = 6.17$). The analysis of the scores obtained by the participants who were employed showed that it was the kind of work that influenced stress. The craftsmen (PSM mean scores: $M = 93.87$, $SD = 5.50$) and farmers (PSM mean scores: $M = 86.80$, $SD = 53.73$) were more stressed than the participants who worked as self-employed individuals (PSM mean scores: $M = 74.86$, $SD = 10.79$; $F = 12.86$; $p < .001$).

**Table 3**
Coefficients of correlation of Pearson between the items to the questionnaire on life perception and PSM scores.

| MSP | *r* |
|---|---|
| 1. I can cope daily worries | −.712* |
| 2. I often think to condition to be an old person | .579* |
| 3. I'm able to have fan and play leisure activities | −.185* |
| 4. My health is good | −.699* |
| 5. In the last year, my condition of old person caused some difficulties to my family | .054 |
| 6. I'm disheartened for my life | .447* |
| 7. I'm satisfied with the activities that I'm doing in this period | −.760* |
| 8. In the last two weeks, my condition of old person did not cause me any difficulties | −.552* |
| 9. I've been wanting to see his family in the last two weeks | .081 |
| 10. I get seek more than others | .717* |
| 11. The future scares me | .494 |
| 12. I would change my past life if I could | .786* |
| 13. I feel alone | .481* |
| 14. I can't to work as when I was younger | .421* |
| 15. I feel blue | .534* |
| 16. In the last two weeks I've been wanting to see my friends | −.132* |
| 17. Today I feel good | −.649* |

** sig: $p < .001$.

#### 4.1.5. Other socio-demographic variables

The other variables (household size and health) did not influence the perception of stress. As far as the size of the household was concerned, the participants had to indicate how many people (including themselves) lived in the same house. Interestingly, the fact of living alone or with other people did not influence on the perception of stress. Furthermore, the presence of age-related diseases did not affect psychological stress.

### 4.2. Correlational analysis

Correlational analysis between the PSM scores and the responses to the single items of the Likert scale was performed. The results are presented in Table 3.

The Results showed a significant correlation between several variables. The psychological stress was highly correlated with the perception that people had about their condition and experience to be an old person. Notably, high correlations were found between the PSM scores and the belief to be able to cope with everyday problems ($r = .71$ $p < .001$), the tendency to think to the status of an old person ($r = .57$ $p < .001$), the perception to be in good health ($r = -.69$ $p < .001$) or to be in worse health than the peers ($r = .71$ $p < .001$), and satisfaction with daily activities ($r = -.76$ $p < .001$).

### 4.3. Regression analysis

Based on the results of the correlation analyses, a hierarchical multiple regression analysis was performed (see Table 4). At the first step, "gender" was introduced to look for possible confounding effects. Previous studies showed that women scored significantly higher than men on psychological stress (Di Nuovo et al., 2000; Matud, 2004). At the second step, the socio-demographic variables were added. "Education," "area in which somebody lived," and "status of employment" were added to the model to evaluate the contribution of socio-demographic variables on psychological stress. At step three, the variables *"I can cope with daily worries," "I often think about my status as an old person," "I'm satisfied with the daily activities," "In the last two weeks, my*

**Table 4**
Hierarchical regression analysis using PSM scores as the dependent variables and the Likert-type scale items as the independent variables.

| | $R^2$ | $R^2$ change | $F^2$ change | Beta | t |
|---|---|---|---|---|---|
| *PSM* | | | | | |
| Step1 | .23 | ..23 | 93.20* | | |
| Gender | | | | .48 | 9.65 |
| Step 2 | ..55 | .32 | 71.38* | | |
| Gender | | | | .43 | 11.07* |
| Rural/urban area | | | | .06 | 1.52 |
| Education | | | | −.54 | −12.84* |
| Employment | | | | −.01 | −.42 |
| Step 3 | .83 | .27 | 53.07* | | |
| Gender | | | | .19 | 7.02** |
| Rural/urban area | | | | .05 | 1.98 |
| Education | | | | −.08 | −2.33** |
| Employment | | | | −.004 | −.13 |
| "I can cope daily worries" | | | | −.22 | −3.60** |
| My health is good | | | | −.04 | −.85 |
| "I often think to my condition of old person" | | | | .02 | .67 |
| "I'm satisfied with the current activities | | | | −.21 | −5.23** |
| In the last two weeks. my condition of old person caused mE some difficulties | | | | .03 | .87 |
| "I get seek more than others" | | | | .15 | 4.53** |
| "I would change my past life if I could." | | | | .23 | 5.93** |
| "I feel blue" | | | | .109 | 3.61** |
| "Today I feel well" | | | | −.086 | −2.57* |

*Note*: * sig: $p < .05$; **sig: $p < .005$.

*condition of being an old person did not cause me some difficulties," "I get sick more than others," "I would change my past life if I could," and "Today I feel good."* These variables were added to detect the contribution of individual perceptions and beliefs on psychological stress.

The results showed that gender, which was introduced as a control variable in the first step of the hierarchical analysis, accounted for a significant proportion of the explained variance ($\Delta R = .23$; $\Delta F = 92.20$, $p < .001$). This model was statistically significant ($F = 93.20$, $p < .001$) and explained 23.8% of the variance in psychological stress. After introducing the socio-demographic variables (i.e., area in which the person lives, education, and status of employment) at Step 2, the total variance explained by the model as a whole was 55% ($F = 93.35$; $p < .001$). The introduction of the social demographic variables explained an additional 32% of the variance in psychological stress, after controlling gender ($\Delta R^2 = .32$; $\Delta F = 71.38$, $p < .001$). At step three, the main items of the Likert-type scale were added. The results showed that at step three the total variance explained by the model as a whole was 83% ($F = 111.11$, $p < .001$). In the final adjusted model, "gender," "education," *"I can cope with daily worries," "I'm satisfied with the current activities" "I get sick more than others" "I would change my past life if I could" "I feel blue," "Today I feel good"* were significant predictors of the perceived stress (see Table 4 for the Beta values).

## 5. Discussion

Perception of stress and beliefs about one's health and social and psychological conditions can influence well-being and the quality of life. The World Health Organization (1993) defines the quality of life as individuals' perception of their position in life in the context of the culture and value systems in which they live and about their goals, expectations, standards, and concerns. It is a broad-ranging concept, which is affected by the person's physical health, psychological state, level of independence, social relationships, personal beliefs and their relationship to salient features of their environment.

Psychological stress is one of the main variables that influence well-being in aging, such as in all the stages of life (Schneiderman et al., 2005). However, psychological stress depends on several variables, which are often difficult to define. The results of the present study contribute to clarifying the variables that influence perceived stress in aging.

Results showed that women were more stressed than men. This finding agrees with those of other previous research (e.g., Barnett, Biener, & Baruch, 1987; Di Nuovo et al., 2000; Matud, 2004). Females often report higher levels of stress than men; the present study confirmed that differences by gender in response to stressful events persist in old age. This study also found that the older people who lived in a rural area and those who were less educated presented higher levels of stress compared to their peers.

Interestingly, housewives and people who never had remunerated work reported higher levels of stress compared to other participants. People who still worked were less stressed than retired people. The retired participants that were engaged in voluntary activities reported a lower level of stress than retired people and people who still worked.

The size of the household did not make an impact on perceived stress. The old participants who lived alone were not more stressed than their peers who lived with the consort or with other family members. Similarly, having an illness or being healthy did not influence perceived stress.

Interestingly, the beliefs on the abilities to cope with daily worries, satisfaction with the current activities, mood, and evaluation of previous life experiences, influenced the stress scores. The trust that older people placed on his or her coping abilities, to manage daily routines, and the overall satisfaction for life, contributed to the sensation of being under pressure that characterizes psychological stress.

## 6. Limitation

The present study has several limitations. The first limitation is that the data were self-reported and some of the responses were retrospective. The second limitation concerns the use of a convenience sample, which limits the generalization of the findings. However, the large size of the sample guarantees a certain generalization of the results. Finally, the design of the study was cross-sectional and did not allow for the evaluation of causal relationships. For this reason, caution should be used in the interpretation of the regression analysis.

Despite these limitations, the results of this study contribute to an in-depth analysis of psychological stress in aging. Unlike previous studies, which have studied objective factors producing stress or psychological impairment connected to stress, the present research investigated subjective appraisal of life experiences and perception of stress, with the aim of deep analyzing the individual's feelings of being under pressure. In particular, since psychological stress is not a psychopathological disease (Lemyre & Tessier, 2008; Lemyre et al., 1990), the present study investigated psychological stress as a set of emotional, cognitive, somatic, and behavioral factors within the range of psychological normality. Moreover, the study did not investigate directly environmental factors connected to well-being but was focused on individual perceptions of personal experiences.

## 7. Conclusion

The results of this study are interesting. This study showed that appraisal that old persons have of their life primarily influences perceived stress. This result is intriguing because psychological stress significantly affects overall well-being. The findings of this study highlight the necessity of considering well-being in aging as a complex goal, whose achievement requires high attention paid to the variables that concern socio-emotional adjustment. This consideration becomes of pivotal relevance when programs or interventions for old age are created.

The contributions of older people in society must be recognized and

valued. Results of the present study permit to hypothesize that encouraging independence is the base for enhancing the well-being of the older person. Older people must have the resources they need to deal with the challenges they face, to achieve a sense of purpose and control in their lives. In aging, individual resilience changes and often a small amount of input can make a significant difference in the ability to cope with the challenges that life present. Promoting well-being and reducing psychological stress in aging is a benefit for the whole of society, and could contribute to reducing the cost of care. Based on these considerations, the services for old people should not be centered only on environmental and objective aids, but they should take into account that well-being and perceived stress are affected by how a person perceives his or her aging.

Based on the results of the present study, it is possible to conjecture that specific programs of social support aimed to increase self-esteem and general self-efficacy of old people, could reduce the perception of stress and increase the possibility to have "positive" aging.

## Contributors

Elena Commodari and Santo Di Nuovo have made substantial contributions to conception and design, acquisition of data, analysis and interpretation of data; 2) All the authors participated in drafting the article 3) All the authors have given final approval of the version to be submitted.

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## Ehical code neurology

The research conformed to the Helsinki Declaration outlining the principles for research involving human subjects. All participants provided informed consent. They acknowledged that they could not be identified via the paper. The study followed Ethical Code for Italian psychologists (L. 18.02.1989, n. 56), Italian law for data privacy (DLGS 196/2003), and Ethical Code for Psychological Research (March 27, 2015) approved by Italian Psychologists Association.

## Declaration of Competing Interest

There is not any conflict of interest.

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## Appendix A. Supplementary data

Supplementary material related to this article can be found, in the online version, at doi:https://doi.org/10.1016/j.npbr.2019.09.001.

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