Title: 'I can't breathe': Anxiety and Emotion Awareness in older adolescents at the time of Covid-19

Running title: Anxiety management in adolescents during the COVID-19

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Abstract

The COVID-19 appears as a catastrophic health risk with psychological, emotional, social and relational implications.

From the early stages of the virus spread, the elderly population was identified as the most vulnerable and the health authorities have rightly focused on such frailest population. Conversely, less attention was paid to emotional and psychological dimension of children and adolescents. Actually, they were less at risk quoad vitam or quoad valetudinem, nevertheless they had to face a reality of anxiety, fears and uncertainties.

The current study investigated state anxiety and emotion awareness in a healthy sample of older adolescents, 84 females and 64 males, aged 17 to 19, during the pandemic lockdown, using Self-rating Anxiety Scale and the Italian Emotion Awareness Questionnaire.

An unexpected anxious phenomenology, impacting the anxiety ideo-affective domain, was found, while the somatic symptomatology appeared to be less severe. The highest anxiety symptom were the breathing difficulties.

These findings supported the hypothesis that the COVID-19 pandemic may be a risk condition for an increased state anxiety in older adolescents and suggest the need to provide 1. an effective, empathic communication system with the direct participation of older adolescents, 2. a psychological counseling service for stress management of adolescents.

Key words: COVID-19 pandemic; virus' transmission; fear of contagion; breathing difficulty; healthy adolescents; emotion awareness; anxiety-state.

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Introduction

The COVID-19 appears as an actual catastrophic health risk showing the features of the severe, imminent, subtle and faceless enemy, with very serious psychological, emotional, social and relational implications for individuals and communities [1–3].

The fear of contagion becomes the dominant idea and the future comes to be catastrophic and threatening. The risk can hide behind every corner and everything and everyone can be a vehicle for disease and death and a potential danger of contagion to be avoided. Fear dominates every other emotion, constantly reinforced by a media bombardment centered on information about the dead, the number of infections, overcrowded intensive care, hospitals unable to accommodate the sick and other fear and anxiety news. The news often spready discordant with one another, alarming or reassuring. It would be little more than an influenza or it would be an unpredictable virus, the level of aggression and the rate of contagion we do not know. In fact, the world is afraid of a terrible invisible enemy that can attack without your being aware of it, in silence, and only after a few days does it manifest itself in all its virulence [1]. A widespread panic and hyperarousal condition develop. A repertoire of unfamiliar behaviours must be taken on to protect yourself from the virus and its lethal power. Almost ritualistic behaviours with a rupophobic and pathophobic imprint are spreading, useful perhaps to the hygiene to contain the virus, but which become a distressing signal of alarm and helplessness [2,4,5].

Moreover, the need to reduce the chances of contagion requires to maintain safety distances and to limit even physical contacts. Therefore, relationships between people experience profound changes and direct communication disappears or in any case lose emotional value mediated by the non-verbal modalities [2,4,5]. Especially since people

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have been forced to stay home for months. Meeting, worship and leisure places, production facilities, services, schools, universities remained closed, forcing students and teachers to experiment with new forms of teaching and learning 'at distance' [6,7].

Worldwide, the elderly population was considered to be the most at risk of contagion and even fatal complications from the virus. Therefore, international health authorities and governments around the world direct attention and resources towards the health problems of elderly population. Doctors, health professionals, clinical departments and hospitals are forced to reduce their institutional interventions to respond, in the first instance, to the COVID emergency and treat the thousands of elderly people in need of care. Requests become increasingly demanding and health facilities are increasingly dominated by COVID patients [8].

In this frame, the world of adolescents and their psychological and emotional reactions become a less focused minority, even if fragile individuals such as adolescents can have highly destabilizing psychological effects. In a developmental stage in which emotions, cognition and peer relationships are oriented towards an expanding positive future of expectations and opportunities [9], suddenly an unpredictable and very serious danger compromises relationships, sociability and any immediate and future planning and it can worsen existing psychological health problems [6].

Therefore, as COVID-19 spreads around the world, to understand adolescents' behaviours and emotions in response to such invisible enemy can certainly be crucial for adolescents' psychological well-being, not only in the short but also in the long term.

On this background, the current study aimed to investigate anxiety among a healthy sample of older adolescents, in order to support the need for psychological interventions with adolescents. Such developmental stage may be viewed as a significant

phase to assess the emotional effects of the pandemic, because it is relatively far off the emotional and behavioural complexity and instability of early adolescence, but not yet emotionally and behaviourally stabilized as in the young adult stage [9]. The hypothesis of the study was that the COVID-19 pandemic could be a condition of greater risk of increasing the level of anxiety in healthy older adolescents, compared to the anxiety levels documented by previous studies in the literature in normal adolescents during the non-COVID time.

Materials and Methods

Participants

The participants were recruited through an advertisement sent by email. The data was collected during the restrictions imposed by the Italian authorities for the COVID-19 pandemic, from 15th of April to 15th of May 2020. This period coincides with phase 1, that is, the most restrictive of the measures in contrast with the spread of the COVID-19. A sample of 148 Italian students, aged between 17 and 19 (average age 17.9 ± 1.2), 84 females and 64 males, attending the last two years of high school, participated in the study. Participants were asked to voluntarily fill in anonymous questionnaires remotely using their own pc or tablet from their own home. Informed consent was obtained from adolescents over the age of 18, parental consent was required for minors to participate in the study. The study was conducted respecting the anonymity and privacy of each participant, and in accordance with the Helsinki declaration. 23 subjects were excluded because their questionnaires were not completed or showed some apparent inconsistencies.

Measures

In order to have not answers directly related to the anxious reactions to the epidemic tout court, no measures openly referring to the epidemic were used.

1. To evaluating anxiety, the Zung Self-rating Anxiety Scale (SAS) was used. It is a standardized self-rating instrument, widely used in research and in clinical practice [10,11], devised to measuring state anxiety (in the last week), as a clinical entity and an operationally defined disorder, and not as a personality trait. It consists of 20 items rated on a 1-4 Likert type scale. Subjects were asked to rate each item as to how it applied to them within the past week, in the following four quantitative terms: none or a little of the time, some of the time, good part of the time, most or all of the time coded respectively as 1, 2, 3 and 4. The total score ranged from 20 (no anxiety at all) to 80 (severe anxiety). So, the lower the score, the less anxious the subject and vice versa.

2. To investigate emotion awareness, the following five subscales of self-report Italian Emotion Awareness Questionnaire for children and adolescents (EAQ) [12,13] were used: 1. Differentiating Emotions, as being aware of one's emotional states and understanding them as distinct states: seven items e.g. 'it is difficult to know whether I feel sad or angry or something else'; 2. Verbal Sharing of Emotions, as the tendency to share emotional experiences with others: 4 items e.g. 'I find it hard to talk to anyone about I feel'; 3. Not Hiding Emotions, as the tendency to refuse to deal with their emotions: 4 items e.g. 'when I am angry or upset, I try to hide this'; 4. Attending to Others' Emotions, as ability to perceive the emotions of others: 5 items e.g. 'it is important to know how my friends are feeling'; 5. Analyses of Own Emotions, as ability to detect and recognize own feelings: 5 items e.g. 'when I am angry or

upset, I try to understand why'. Participants were asked to rate the degree to which each item was true about them on a 3-point scale (1: Not true; 2: Sometimes true; 3: Often true). Score range from 25 to 75. The higher the score, the better the emotion awareness.

Statistical analysis

Percentages, means and standard deviations (SD) of the responses were computed for each item of the SAS and EAQ questionnaires. In order to test the items most representative for each questionnaire, the items were sorted in descending order by the item that had a higher rating than the one that had a lower rating.

In order to investigate the differences in the mean change of scores between males and females, the independent *t test* was conducted.

Pearson's correlations were used to measure the strength of relationship between SAS and EAQ. A *p value* < .05 was set as an indication of statistical significance for the analyses.

Results

Table 1 shows the mean absolute values (on the maximum score of 4) and as percentage of SAS anxious scores listed in decreasing order, from the highest score items, showing a higher level of anxiety, to the lowest score items, showing a lower level of anxiety. SAS overall mean score was 42.2 ± 4.7 (52.5% of the maximum possible score). In 12 items out of 20, the mean agreement score was higher than or equal to 2 (on maximum 4) , indicating that in these items, most participants tended to choose the high anxious agreement responses 'good part of the time', coded as 3, or 'most or all of the

time', coded as 4. Item recording the highest score was item 13 of breathing difficulties ('I can breathe in and out easily') where 85% of the participants chose the highest score with a mean of $3.4 \pm .81$. Similarly, in the item 19 of sleep disorder ('I fall asleep easily and get a good night's rest'), mean was $2.6 \pm .10$. Likewise, items of anxiety, panic, negative expectation of the future or somatic signals of anxiety: item 1'I feel more nervous and anxious than usual'(mean $2.5 \pm .68$), item 3 'I get upset easily or feel panicky' (mean $2.4 \pm .78$), item 5 'I feel that everything is all right and nothing bad will happen' (mean $2.3 \pm .79$), item 17 'My hands are usually dry and warm' (mean 2.4 ± 1.0). Instead, reached the lowest scores items referring to somatic disorders such as item 12 'I have fainting spells or feel like it' (mean $1.4 \pm .63$), where 96 % of participants chose the lowest scores ('none or a little of the time' coded as 1 or 'some of the time' coded as 2), or item 6 'My arms and legs shake and tremble'(mean $1.4 \pm .78$) where 90% of participants chose the lowest scores 1 or 2.

Table 2 displays, in decreasing order, absolute mean values on the EAQ and the percentage ratio between the score actually reached, at each individual subscale, and the maximum score. 'Attending to others' emotions', 'analyses of own emotions', and 'differentiating emotions' were the subscales with the highest score, indicating high specific emotional ability. In these subscales, the average agreement score was between two and three, showing that most participants tended to choose between 'sometimes true' coded as 2 and 'often true', coded as 3.

Conversely, 'verbal sharing of emotions' and 'not hiding emotions' subscales were the two with the lowest score, indicating a low specific emotional ability. In both two scales, the average agreement score was below 2, showing that most participants tended to choose between 'not true' coded as 1, or 'sometimes true' coded as 2. For example,

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item 6 of 'verbal sharing' subscale 'when I am upset about something, I often keep it to myself' (mean $1.70 \pm .68$), or item 15 of 'not hiding emotions' subscale: 'when I am upset, I try not to show it' (mean $1.78 \pm .71$).

Furthermore, both SAS and the EAQ scores were examined in relation to sex. Female's anxiety total scale scores appeared significantly higher than those of males (43.5 ± 4.6 vs 39.3 ± 3.7; $t_{146}= 3.06$; $p= .003$), but not EAQ scores (57.9 ± 10.4 vs 58.3 ± 8.3; $t_{146}= .15$, $p = .88$).

SAS total score and EAQ total score did not correlate and Pearson's correlation index was very close to zero ($r = -.09$, $p= .28$). Correlations between SAS total scores and individual EAQ subscales were similarly low.

Discussion

The current study aimed to investigate state anxiety and emotion awareness in a healthy sample of older adolescents. It was hypothesized that by effects of COVID-19 pandemic, the sample would have shown a high level of anxiety. The age group around 18 was chosen to minimize any high anxiety levels or a low emotion awareness due to the emotional-affective instability of younger adolescence. Similarly, SAS and EAQ were chosen because did not present any reference to the pandemic.

In the current study, over half of the SAS individual items (12 out 20), and consequently the SAS total score, reached a high anxiety score, above 50% of the maximum value. Previous studies, in non-COVID time, had found a lower total SAS score (between 32 and 34) in a large non-clinical sample of college students (more than 1500 participants), aged around 19, randomly recruited [11,14,15]. In addition, the Zung's rating scale measures 'state anxiety' as a transient expression of a temporary emotional

condition, relative to the current period (in the last week). State anxiety construct refers to a momentary interruption of an emotional positive continuum expressed in a subjective feeling of tension, worry, restlessness, nervousness, reactivity also through an activation of the autonomic nervous system and several physiological activations [16,17]. Conversely, 'trait anxiety' construct expresses a stable modality of emotional functioning dominated by anxiety which favours a constant perception of danger and threat even in the face of neutral events or with low anxiety value. Therefore, since the sample was a healthy non-clinical one and the SAS measured state and non-trait anxiety, high level of the anxiety observed would not appear to be attributed to the sample's stable emotional functioning, but it is likely to be due to a temporary condition or feeling of tension and apprehension that favours a leavening of anxious responses. Especially as, on the qualitative level, the item reaching the highest anxiety score was the item of breathing difficulties. In none of the previously mentioned studies, the score on this item reached such high level [e.g.11,14,15].

It is interesting to point out that it is widely shared, among the public opinion, that breath is the very easy vehicle for the virus' transmission and coronavirus mainly impacts on respiratory function while breathing difficulties are among the first manifestations of viral activity in the human body. The circulating news persistently focused on 'assisted breathing', 'breathing machines', 'intubation'. It is very easy, therefore, that a high percentage of the sample (85%) complaints about not being able to 'breathe in and out easily'. Moreover, breathing's rhythm changes in accordance to emotional stress. Anxiety, stress or panic increase the respiratory rate and the amount of air in the lungs resulting in the feeling of shortness of breath and even of anguish that takes your breath away (from the Latin 'angustia' as a sense of oppression or narrowness). To breathe is to

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live. Man is born with the 'first breath' and dies exhaling the 'last breath'. In the biblical story, Adam begins to live when his creator blows the breath of life, 'inspiravit spiraculum vitae'. Chronic respiratory diseases in pediatric age appeared as a significant source of stress also for the mothers, impacting on their personality traits and on memory performances [18].

Likewise, items referring to sleep disorder, anxiety, panic and a negative expectation of the future reached high average score. Sleep is one of the great anxiety-sensitive functions. Just as the catastrophic expectation of the future, restlessness, feeling nervous are symptomatic expressions of anxiety, through the motor and neurovegetative pathways. Coronavirus not only brings death in the short term, but also destabilizes behaviour patterns in the long. Production models, employment policies, social and interpersonal relationships, leisure habits, education and training systems and every consolidated behavioural repertoire must be rethought and reformulated according to coronavirus and the risk of contagion. Especially for younger generation, therefore, the overall future becomes nebulous, confused, uncertain and distressing. An anxious phenomenology develops impacting the anxiety ideo-affective dimension, while the somatic symptomatology, such as fainting, tremors, dizziness, paraesthesia, appears to be less severe.

Conversely, on the EAQ, total emotional awareness score reached quite high levels, compared to the maximum score, showing valid emotional abilities in the sample. On the qualitative view, 'Attending to others' emotions' and 'Analyses of own's emotions' were the two subscales with the highest scores. The participants consider important to know, analyse, understand and care for the emotions of others and one's own both in normal and problematic conditions ('if a friend is upset'). Contrarily, they self-

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rated as less willing to verbal share own's emotions with others, and they showed difficulty to explain emotions as 'to talk to anyone about how I feel', believing, for example, that 'when I am feeling bad, it is no one else's business'. On the one hand, therefore, openness and willingness to evaluate and understand the emotions of others and one's own, on the other, less willingness to share one's emotions with others.

In the correlational analysis, anxiety and emotional awareness overall scores appeared as two unrelated variables. Therefore, anxiety observed in the study did not seem associated to emotion awareness and management. It is further confirmed the nature of state anxiety, which occurs temporarily in a particular historical condition, and the hypothesis that the epidemic promotes an increase in anxiety even in adolescents with good awareness of their own and others' emotions. These findings supported the hypothesis that the COVID-19 pandemic and following restrictive measures may be a risk condition for an increased state anxiety level in older adolescents. Probably, widespread anxiety and fear, prolonged isolation in a restricted domestic environment, forced removal from school friends and relatives, the fear of being infected, the confused or contradictory information, the uncertainties of the personal and family future support an increase in anxious responses. Such data are consistent with similar recent studies on college students in China indicating that the students were troubled by anxiety of the COVID-19, probably for the possible effect on their studies [19], future employment [20], and on their interpersonal relationships [21,22].

Examining both the EAQ and SAS in relation to sex, female's anxiety scale scores appeared significantly higher than those of males whereas no significantly differences were found at the emotion awareness. Probably, girls feel the distress of the moment with greater anxiety, even though they manifest emotional awareness skills similar to that of

boys. This finding was inconsistent with Cao and colleagues [1] that male and female students in a sample of University students in China experienced similar stresses and negative emotions due to the epidemic.

As psychological community implication, data suggest the need to develop intervention programs focused on the emotional and affective reactions of older adolescents. As the pandemic is inevitable, unpredictable and uncontrollable [23], and as the restrictive measures are the only way to contain the spread of the infection, the golden rule in addressing adolescents' anxiety may be to provide 1. an effective, empathic communication system and reassuring with the direct participation of adolescents 2. a psychological counseling service for stress management.

In a recent editorial, the Lancet, in order to prevent 'the disease of panic', highlighted that Covid-19 pandemic cannot be prevented, nevertheless provide the people with accurate information 'is the most effective prevention against the disease of panic' [24]. A communication aimed at older adolescents should offer them the possibility of being properly and honestly informed and of getting out of isolation by sharing with others their fears, anxieties and irrational beliefs. Such communication system should be not only factual, but focused on their problems as, for example, the management of any physical symptoms potentially related to the infection, the real ways of transmitting the virus, the duration of the restrictive measures, the short-term effects of the pandemic on the school year, lifestyle, leisure activities, interpersonal relationships and the economic conditions of their families, the validity of fake news, and the long-term effects on their future and their families [25].

Likewise, a psychological counseling can provide online services to cope with mental health issues due to anxiety from pandemic and contagion or from intrafamilial

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interpersonal relations. According to Petersen' suggestion, fear must be handled through an 'optimistic anxiety', that is, being anxious enough 'to take the advice of the authorities to heart' and optimistic enough to feel that one's actions make a difference [26]. Promotional videos may be used by experienced psychologists to increase healthy lifestyle, promoting the maintenance of adequate physical activities and hygiene habits, an appropriate diet and a regular sleep-wake rhythm.

Both effective, empathic information and psychological counseling, monitored by experienced adults, directly involving adolescents, can mitigate their anxiety reactions and may help them to handle uncertainty and fear contextualizing individual vulnerability.

In conclusion, it is important to underline a limitation of the presented study concerning the sample size. Unfortunately, unusual condition of forced distancing led us to use a remote data collection method and to dedicate a large part of the work to building the online task. This has limited us in recruiting a larger sample.

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Declarations of interest: none

Conflict of Interest Statement and Compliance with Ethical Standards: The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest and in compliance with ethical standards.

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Table 1 – SAS absolute mean values and as percentage (on the maximum score of 4) listed in decreasing order

items	domain	mean ± sd	score %
13	breathing	3.4 ± .81	85
19	sleep	2.6 ± 1.0	65
1	nervous, anxious	2.5 ± .68	62.5
17	hands warm	2.4 ± 1.0	60
3	upset, panicky	2.4 ± .78	60
5	fear of future	2.3 ± .79	57.5
7	headache	2.3 ± .97	57.5
9	calm	2.3 ± .78	57.5
16	urinary	2.3 ± .83	57.5
8	weak, tired	2.1 ± .89	52.5
18	hot face	2.0 ± .92	50
10	heartbeat	2.0 ± .71	50
2	afraid no reason	1.9 ± .80	47.5
20	nightmares	1.9 ± .72	47.5
4	falling apart	1.9 ± .64	47.5
15	stomach ache	1.8 ± .82	45
14	paraesthesia	1.8 ± .81	45
11	dizzy spells	1.6 ± .95	40
6	shake, tremble	1.4 ± .78	35
12	fainting spells	1.4 ± .63	35
1-20	**overall**	**42.2 ± 4.7**	**52.7**

Legend: The light grey indicates score above 50% items, the dark grey indicates score below 50% items.

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Table 2 – EAQ and 5 subscales absolute mean values and as percentage (on the maximum score for each scale) listed in decreasing order

subscale	mean ± sd	score %
4. Attending to others' emotions	13.8 ± 1.9	92.1
5. Analyses of own's emotions	13.1 ± 2.2	87.3
1. Differentiating emotions	15.2 ± 3.5	72.3
3. Not Hiding emotions	8.2 ± 2.1	68.2
2. Verbal sharing of emotions	7.9 ± 2.5	65.7
Total score	**58.2 ± 8.2**	**77.6**