ISSN online 1688-4221 *Ciencias Psicológicas* July-December 2021; 15(2): e-2164
doi: https://doi.org/10.22235/cp.v15i2.2164

The role of self-efficacy, self-esteem and self-concept in depression in adolescents

O papel da autoeficácia, da autoestima e do autoconceito na depressão em adolescentes

El papel de la autoeficacia, la autoestima y el autoconcepto en la depresión en adolescentes

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***Abstract*:** This study sought to assess the relationship between self-efficacy, self-esteem, self-concept and depression in adolescents. For this purpose, we tracked depressive symptoms and the levels of self-efficacy, self-esteem and self-concept, as well as the ability to predict these constructs on symptoms. Finally, we checked if there is a relationship between predictor(s) and symptoms moderated by gender and age. The sample consisted of 501 adolescents, with a mean age of 16.4 years. Almost half of the adolescents had a positive screening diagnosis for depression and moderate levels in the three constructs. Only self-efficacy was a negative predictor of symptomatology, and this relationship didn't suffer from the interaction of the sex or age. The results show the relevance of self-efficacy in understanding the occurrence of depression in this group, providing support for its diagnosis, preventive actions and treatment.

***Keywords**:* depression; self-efficacy; self-esteem; self-concept; adolescent.

***Resumo*:** Este estudo buscou avaliar a relação entre autoeficácia, autoestima, autoconceito e depressão em adolescentes. Para tanto, realizou-se o rastreamento de sintomas depressivos e dos níveis de autoeficácia, autoestima e autoconceito, bem como se analisou a capacidade de predição desses construtos sobre a sintomatologia. Verificou-se, ainda, se a relação entre preditor(es) e sintomas foi moderada pelo gênero e idade. A amostra foi constituída por 501 adolescentes, com média de idade de 16,4 anos. Quase metade dos adolescentes apresentou diagnóstico positivo de rastreamento para depressão e níveis moderados nos três construtos avaliados. Apenas a autoeficácia foi preditora negativa da sintomatologia e essa relação não sofreu efeito de interação do gênero ou idade do adolescente. Os resultados denotam a relevância da autoeficácia no entendimento da ocorrência de depressão nesse grupo, fornecendo subsídios para sua utilização como suporte ao diagnóstico, ações preventivas e tratamento.

***Palavras-chave**:* depressão; autoeficácia; autoestima; autoconceito; adolescente.

***Resumen*:** Este estudio buscó evaluar la relación entre autoeficacia, autoestima, autoconcepto y depresión en adolescentes. Para eso, se realizó el seguimiento de los síntomas depresivos y los niveles de autoeficacia, autoestima y autoconcepto, así como la capacidad de predecir estos constructos sobre los síntomas. También se verificó si la relación entre los predictores y los síntomas fue moderada por género y edad. La muestra consistió en 501 adolescentes, con edad media de 16.4 años. Casi la mitad de los adolescentes tenían un diagnóstico de detección positivo para la depresión y niveles moderados en los tres constructos. Solo la autoeficacia fue un predictor negativo de sintomatología y esta relación no sufrió la interacción del género o la edad del adolescente. Los resultados muestran la relevancia de la autoeficacia en la comprensión de la aparición de depresión en este grupo, proporcionando apoyo para su uso como apoyo para el diagnóstico, prevención y el tratamiento.

***Palabras clave**:* depresión; autoeficacia; autoestima; autoconcepto; adolescente.

Received: 05/14/2020 Accepted: 09/27/2021

How to cite:
Nunes, D. & Faro, A. (2021). The role of self-efficacy, self-esteem and self-concept in depression in adolescents. *Ciencias Psicológicas*, *15*(2), e-2164. doi: https://doi.org/10.22235/cp.v15i2.2164

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Adolescence is considered a period of potential vulnerability, in which much of the load of mental illnesses emerge. Worldwide, it is estimated that 10-20 % of adolescents experience some mental health or neuropsychiatric problem, representing the main cause of years lost due to disability (which represents the equivalent of a full year of healthy life lost due to disability or health problems) among adolescents and young people (Patton et al., 2014). In Brazil, there is an estimated 30 % prevalence of Common Mental Disorders (CMD) in this group (Lopes et al., 2016). When not treated in adolescence, consequences of these conditions can extend into adulthood and result in damage to physical and mental health, limiting opportunities for a healthier life as adults. Among these conditions, emotional disorders, including depression, are the most frequent in adolescence and represent a significant impact on the etiology of other diseases and disabilities (World Health Organization [WHO], 2014).

Depression onset in adolescence is associated with greater functional impairment, psychiatric comorbidities, and suicide (Van Noorden et al., 2011). Most depressed adolescents have psychiatric comorbidities throughout their lives, with anxiety disorders being the most common (30 % to 80 %). Estimates also indicate that 5 % to 10 % of depressed adolescents commit suicide within 15 years of their first episode of depression, in addition to being seven times more likely to commit suicide, compared to adolescents without

a diagnosis of depression. Furthermore, the presence of depressive symptoms in adolescence is associated with numerous adverse outcomes in adulthood, including less education and worse health indicators (Rohde, Lewinsohn, Klein, Seeley & Gau, 2014).

Gender differences are reflected in the incidence, course, and number of depressive episodes (Lewis et al., 2015). Studies also indicate that before puberty there is a greater tendency for the presence of symptoms in boys (Johnson & Whisman, 2013; Rohde et al., 2014). After this period, girls begin to show consistently higher rates of depression. There is also differentiation in terms of symptomatology. Girls have a greater number of internalizing symptoms, such as lowered moods and constant crying, while boys express more externalizing symptoms, such as difficulty concentrating and aggressiveness. The etiology of these differences is complex and can be explained from biological (hormonal changes), environmental (socialization processes) and psychological (greater presence of negative affect and rumination) factors (Baptista, Borges & Serpa, 2017).

Different biological and psychological theories sought to establish the etiology of depression. Beck's Cognitive Theory (Beck, Rush, Shaw & Emery, 1979) is one of the most widely accepted theories among contemporary cognitive models. According to this model, depression is caused by the activation of schemas that track and encode the depressed individual's experience in a negative way, reflected in three dimensions, namely: negative views about himself, in which the person sees himself as inadequate or inept; the world, including a negative tendency to interpret their interpersonal relationships; and the future, characterized by the idea of hopelessness (Beck et al., 1979). In adolescence, individuals acquire new skills that allow them to make abstractions about themselves and others, which will constitute a set of interrelated and continuously developing self-beliefs. This set of beliefs about oneself, which includes self-concept, self-esteem, and self-efficacy, plays a moderating role in the occurrence of depression, acting as a protective component or enhancing the presence of symptoms (Rodriguez & Loos-Sant'Ana, 2015).

Self-efficacy refers to the individual's beliefs about their ability to organize and execute a certain course of action to achieve a result (Bandura, 1997). Self-efficacy also acts on the self-regulation of emotional states, influencing the individual's vulnerability to the occurrence of depressive symptoms. Numerous evidences, in different contexts, point to the relationship of self-efficacy and depression in adolescents, and their role in promoting adaptive outcomes in the face of adversities inherent in this stage of development, including transition from the family environment to impersonal environments, the complexity of high school, findings related to sexuality, among others (Guerra, Farkas & Moncada, 2018; Lara, Patiño, Navarrete, Hernández & Nieto, 2017; Muris, Meesters, Pierik & Kock, 2016; Tak, Brunwasser, Lichtwarck-Aschoff & Engels, 2017).

Self-esteem and self-concept are cognitive constructs that commonly have a close relationship with self-efficacy. Self-esteem refers to an individual's subjective assessment of their values as a person (Orth & Robins, 2014). Self-concept, in turn, is a broad construct that involves people's perception of themselves in different domains, including social, familial, and physical, among others (Harter, 1985). Within the cognitive model of depression, the three constructs refer to the individual's beliefs about oneself and help to explain the presence of depressive symptoms. That is, negative self-efficacy, self-esteem, and self-concept beliefs tend to be associated with a higher probability of depression (Galicia-Moyeda, Sánchez-Velasco & Robles-Ojeda, 2013; Steiger, Allemand, Robins & Fend, 2014).

However, self-efficacy has played a prominent role in longitudinal and interventional research focusing on its development for the management and remission of depressive symptoms (Morton & Montgomery, 2012; Shoshani & Steinmetz, 2014; Tak et al., 2017).

Cognitive constructs, especially self-efficacy, express an important aspect in the adjustment process, as they moderate the impacts produced by adaptive challenges. Thus, studying them as predictors of depression is relevant for the adoption of more assertive preventive and diagnostic actions, as well as helping to better understand the phenomenon. Thus, the main objective of this study was to assess the ability to predict self-efficacy, self-esteem, and self-concept about depressive symptoms in adolescents. Other objectives included screening for depressive symptoms and analyzing the moderating role of gender and age variables in the relationship between the main predictors and symptoms of depression.

Method

Participants

The sample consisted of 501 adolescents, with a mean age of 16.4 years (*SD* = 1.15; *Min*. = 14 and *Max*. = 19), with the majority being female (*n* = 276; 55.1 %). High school students participated in the research, being 32.9 % from the 1st year (*n* = 165), 42.3 % (*n* = 212) from the 2nd year and 24.8 % from the 3rd year (*n* = 124), in both public and private schools from a capital city (*n* = 315; 62.9 %) and cities in the rural area (*n* = 186; 37.1 %) of Northeastern Brazil. The research design was non-probabilistic, with convenience sampling, carried out inside the classroom.

Instruments

A sociodemographic questionnaire was used containing information to characterize the sample, such as gender (male or female), age (in years) and education (1st, 2nd or 3rd year of high school). The perceived General Self-Efficacy Scale (GSE; Schwarzer & Jerusalem, 1995) was applied, adapted and validated for Brazil by Souza and Souza (2004). The GSE contains 10 items on a Likert scale from 1 (*It's not true about me*) to 4 (*It's completely true about me*). The final score was obtained from the sum of the items, ranging between 10 and 40 points, in which the higher the score, the greater the self-efficacy belief. In the present investigation, the scale presented Cronbach's alpha equivalent to .85.

The Multidimensional Self-Concept Scale (MSCS; Sarriera et al., 2015), a version adapted for the Brazilian context from the Form 5 Self-Concept Scale (AF5; García & Musitu, 2014). The measure contains 24 items with a possible answer between 1 (*never*) and 5 (*always*) points, covering the academic, family, physical and social self-concept dimensions. The scale ranges from 24 to 120 points, where higher scores indicate a more positive perception of the individual's self-concept. The scale presented a Cronbach's alpha of .87 in this research.

We also used the Rosenberg Self-Esteem Scale (RSES; Rosenberg, 1965), adapted for Brazil by Hutz (2000). The scale has 10 items arranged from 1 (*strongly disagree*) to 4 points (*strongly agree*). The total score varies between 10 and 40 points, the higher the score, the greater the participant's perception of self-esteem. The instrument obtained a Cronbach's alpha of .87 in this sample.

Finally, we applied the Patient Health Questionnaire-9 (PHQ-9; Kroenke, Spitzer & Williams, 2001), translated and adapted by Lima, Mendes, Crippa and Loureiro (2009), which was used to track depressive symptoms. The instrument was built based on the DSM-IV diagnostic criteria for major depressive disorder, allowing for the classification of severity levels (mild, moderate, or severe). The measure consists of nine items, evaluated on a scale (0 = *never* to 3 = *almost every day*) that measures the frequency of signs and symptoms of depression in the last two weeks. The final score ranges from 0 to 27 points. A score equal to or above 10 points represents a positive indication of depression. In this study, this measure had a Cronbach's alpha of .85.

Ethical Aspects and Procedures

This research was approved by the Ethics Committee for Research with Human Beings (Research Registry, CAAE: 10476319.2.0000.5546). Initially, authorization was obtained from educational institutions, as well as from parents or guardians through the Authorization Term. Adolescents who agreed to participate signed a Free and Informed Consent Form (FICF), containing the objective of the research, guarantees of confidentiality and the right to refuse or withdraw consent at any stage of the research process. Data were collected in person in the classroom, self-administered and with an average duration of 30 minutes.

Data Analysis

Analyzes were performed using the Statistical Package for the Social Sciences (SPSS, version 25). Priorly, exploratory statistics were performed, with the replacement of lost and extreme cases (less than 1 % of the total sample) by the mean, as well as the analysis of the asymmetry and flattening coefficients to assess the normality of the distributions. Then, descriptive statistics (percentage frequency, mean and standard deviations) were obtained.

To assess the prediction of symptoms of depression, multiple linear regression analysis (backward method) was conducted (Field, 2009). The PHQ-9 depression score was entered as the dependent variable (DV) and the self-efficacy, self-concept, and self-esteem scores as independent variables (IVs). From the result of this analysis, the moderating role of gender and age variables in the relationship between depression and the predictor variable(s) was verified. Moderation analysis consists of the effect of a variable on the direction or strength of the relationship between a predictor (independent) variable and the predicted (dependent) variable. Moderation analysis allows the identification of individual differences or situational conditions that alter the relationship established between two other variables (Edwards & Lambert, 2007).

Initially, compliance with the assumptions for performing the moderation analysis was analyzed: the data must present homoscedasticity (the constant variances of the errors are the same for all combinations of independent and moderating variables) and cannot indicate multicollinearity (highly correlated variables); and residue must be normally distributed (Hayes, 2012). Subsequently, it was verified whether the dependent and independent variables established significant associations with the moderating variables through the t test (gender) and Pearson's correlation (age). Once these criteria were met, the

moderation analysis was conducted in the Process tool for SPSS (version 3.4). The significance level adopted for all analyzes was $p < .05$.

Results

On the self-efficacy, self-esteem and self-concept scales, the participants had a mean score of 27.9 (*SD* = 6.22; *Min*. = 10; *Max*. = 40), 26.9 (*SD* = 6.45; *Min*. = 11; *Max*. = 40) and 81.9 (*SD* = 16.34; *Min*. = 41; *Max*. = 120), respectively. On the depression scale, the mean score was 10.4 (*SD* = 6.58; *Min* = 0; *Max* = 27), and 48.7 % (*n* = 244) had a positive screening diagnosis for depression in the PHQ-9 (score equal to or greater than 10 points).

Relationship between depression and constructs

Pearson's correlation analyzes showed that the scores of the variables measured had a statistically significant correlation ($p < .001$), meeting the assumption for performing linear regression. Table 1 shows the correlation coefficients between depression, self-efficacy, self-esteem, and self-concept.

Table 1.
Correlation index between depression, self-efficacy, self-esteem, and self-concept scores

	(1)	(2)	(3)
Depression	-	-	-
(1) Self-efficacy	-0,501*	-	-
(2) Self-esteem	-0,689*	0,613*	-
(3) Self-concept	-0,561*	0,565*	0,660*

Notes: (1) = Depression; (2) = Self-efficacy; (3) = Self-esteem. * $p < 0,001$.

In the multiple regression analysis, using the PHQ-9 score of depressive symptoms as the dependent variable, the model generated presented an adjusted coefficient of determination (R^2) of 25 % ($R^2 = 0.250$, $F = 167.44$; $p < .001$) and self-efficacy was the only variable that remained in the model, being a negative predictor of depression ($\beta = -0.50$; $p < .001$). The self-esteem and self-concept variables were not statistically significant and were excluded from the final model ($p > .05$). The initial evaluation of the assumptions of linear regression, multicollinearity, and the analysis of the residuals of the regression did not indicate problems in the validity of the final model.

Moderation analysis

Based on the results of the multiple regression analysis, a moderation analysis of the gender and age variables in the relationship between self-efficacy and depression was conducted. When evaluating the assumptions, there were no problems that would prevent the analysis from being carried out. The t test indicated statistically significant differences by adolescent gender in self-efficacy ($t = 6.37$; $p < .001$) and depression ($t = -6.53$; $p < 0.001$) scores. Pearson's correlation showed a positive and significant association between age and

self-efficacy score (r = 0.12; p = .006) and a negative and significant association with the depression score (r = -0.16; p < .001).

As a result of the moderation assessment, it was seen that both sociodemographic variables did not show a significant interaction effect with self-efficacy, indicating that the relationship between self-efficacy and depression was not moderated by gender (b = -0.525, 95 %CI [-0.221 ; 0.116]; t = -0.61; p = .542), nor by the age of the adolescent (b = 0.007, 95 %CI [-0.061; 0.075]; t = 19; p = .842).

Discussion

Adolescents in this sample showed levels above average on the self-efficacy, self-esteem, and self-concept scales. Other studies have also reported similar findings (Carlsen et al., 2017; Chui & Wong, 2016; Sznitman, Zimmermann & Petegem, 2019). These three constructs reflect a set of beliefs about oneself that are interrelated and continually evolving. In adolescence, the individual acquires new cognitive skills that allow for the realization of abstractions and reflections about themself, others, and their capabilities. These beliefs take on meaning and integrate a unique sense of identity, developed from personal experiences, self-reflection, and feedback from important affective figures (Rodriguez & Loos-Sant'Ana, 2015). Therefore, levels above the average of self-efficacy, self-esteem, and self-concept are associated with a more adapted functioning, influencing the psychological adjustment in the face of challenges inherent to adolescence. While below-average beliefs are associated with the presence of negative health outcomes, such as the occurrence of common mental disorders (Shoshani & Steinmetz, 2014; Stoddard & Pierce, 2015).

As for depressive symptoms, almost half of the participants in this study had a positive screening diagnosis for depression, following the trend of other studies with this population (Bhatta, Champion, Young & Loika, 2018; Moeini, Bashirian, Soltanian, Ghaleiha & Taheri, 2019; Yang, Lau & Lau, 2018). The presence of depressive symptoms in adolescence, although at clinically non-significant levels, is associated with a series of maladaptive outcomes, including more frequent presence of physical health problems (Wright et al., 2016), higher school absenteeism (Gonzálvez et al., 2018), increased risk of attempted and completed suicide (Twenge, Joiner, Rogers & Martin, 2018), among others. Because of this, depression in adolescents has been a global issue in health discussions. In any case, although the body of knowledge about the phenomenon has advanced in numerous aspects, there is still a need to improve methods of prevention, diagnosis, and treatment (Thapar, Collishaw, Pine & Thapar, 2012). Thus, analyzing cognitive constructs as predictors of depression contributes both to the assessment – as it identifies which individuals are more vulnerable – as well as to the treatment –from the elaboration of strategies for the development of more adaptive beliefs about oneself.

Belief in their own ability to take action to achieve results is a crucial factor in teenagers' emotional well-being. In this study, self-efficacy was the only cognitive construct that remained in the multiple linear regression analysis model, and it was seen that lowered levels of self-efficacy were predictive of higher levels of depressive symptoms. No study was identified in the literature that investigated the three constructs together and their relationship with depressive symptoms, as was done in this research. However, there is evidence pointing

to the relevance of self-efficacy in explaining of depression in adolescents (Guerra et al., 2018; Muris et al., 2016; Tak et al., 2017). Bandura, Pastorelli, Barbaranelli and Caprara (1999) explain that lowered levels of self-efficacy can produce depressive symptoms through three manners. The first would be from the discrepancies between personal aspirations and perceived abilities. From this perspective, adolescents establish patterns that are incompatible with their abilities, reducing the probability of success and achievement of their goals and, consequently, producing feelings of guilt and incapacity. A second path would be through a low sense of social effectiveness to develop satisfactory interpersonal relationships that help to control chronic stressors. Finally, a third way would be through the low sense of exercising control over one's depressive thoughts.

Self-esteem and self-concept were not statistically significant in predicting depressive symptoms in adolescents in this study. Other investigations that analyzed the relationship of at least two among the three constructs evaluated here and the occurrence of depression had already observed some overlap between them (Chang, Yuan & Chen, 2018; Yang et al., 2018). This overlap may have caused the variables to be excluded, since the regression tends to control this condition and, conceptually, the proximity between the three may have affected the simultaneous measurement (Rodriguez & Loos-Sant'Ana, 2015). This conceptual proximity influences the measurement process of the constructs. For example, to measure self-efficacy, item 1 asks "I can solve most problems if I make the necessary effort", while in the measure of self-esteem, item 4 assesses whether "I think I'm able to do things as well as most people", which may suggest overlapping measures in some way. Still, it is worth noting that the assessment of multicollinearity of the final model of this study did not indicate the presence of problems in the analysis, which means that this overlap was not caused by instruments themselves, but it was an expected effect in the use of concepts that share some similarities. In any way, this does not mean that self-esteem and self-concept are not relevant to explain the phenomenon, but that, together with self-efficacy, only this last variable had an exclusive predictive capacity in predicting the depression score of the present sample.

It was seen that the relationship between self-efficacy and depressive symptoms was not moderated by gender and age variables. This demonstrates that the ability of self-efficacy to predict depressive symptoms is not significantly influenced by these sociodemographic variables. That is, low levels of self-efficacy predict high levels of depressive symptomatology in boys and girls, younger or older, without changing the intensity or direction of this relationship. This finding provides subsidies for the development of intervention protocols and more assertive, parsimonious, and pragmatic practices, as it is possible to use indistinct techniques for both genders and all age groups. In other words, interventions aimed at the adaptive development of self-efficacy in the prevention, reduction, or remission of depressive symptoms in adolescents will be effective without distinction between groups.

It is noteworthy that statistically significant differences were observed by gender in the levels of self-efficacy and depression, with girls showing lower levels of self-efficacy and higher levels of depression compared to boys. However, this variable did not moderate the relationship between IV and DV analyzed in this study, that is, low levels of self-efficacy predict the occurrence of depression regardless of the adolescent's gender. This finding demonstrates consistency in the explanatory capacity of self-efficacy beliefs and adolescent mental health outcomes and does not imply that one should ignore the influence of individual

differences in self-efficacy levels or the occurrence of depression. Numerous studies have pointed out gender differences in self-efficacy levels in different domains, for example, girls have higher levels of self-efficacy in managing academic and social activities, whereas boys have higher self-beliefs in dealing with emotional and affective states (Claster & Blair, 2017; D'Lima, Winsler & Kitsantas, 2014). It is also known that girls are more likely to have depressive symptoms than boys (WHO, 2014). Differences in self-efficacy levels (Ndika, Olagbaiye & Agiobu-Kemmer, 2009; Scott et al., 2008) and depressive symptoms (Baptista et al., 2017) due to the adolescent's age group are also pointed out. Therefore, the adolescent's gender and age are variables that should be considered regarding the differentiation of self-efficacy beliefs and the occurrence of depression. However, these sociodemographic variables, according to the results of the present research, do not seem to change the relationship established between self-efficacy and depressive symptoms.

Conclusions

In summary, it was seen that the adolescents in this sample had moderate levels of self-efficacy, self-concept, and self-esteem and almost half of them were diagnosed with positive screening for depressive symptoms. Among the cognitive constructs, self-efficacy was the only self-belief to predict symptomatology in adolescents. Furthermore, it was observed that this relationship is not moderated by the participant's gender or age. It is noteworthy that no study with these objectives was identified in the national and international literature, this being the first with adolescents in northeastern Brazil.

As a limitation of this study, it is highlighted that the sample was non-probabilistic and by convenience, with no population representativeness. Therefore, it is necessary to be careful when generalizing the results to adolescents from other contexts. In future studies with representative samples, and from other regions, it may be possible to verify the stability of self-efficacy beliefs in explaining the occurrence of depression in this group. In this research, the design was cross-sectional, and the instruments used had tracking characteristics, with no clinical diagnosis of depression being performed in adolescents. Therefore, it is suggested to carry out longitudinal studies, of an interventional nature and in clinical samples to verify not only the capacity of self-efficacy to predict the occurrence of depression, but also to assess its role in the remission of symptoms. It is also noteworthy that a general scale of self-efficacy was used, and it is recommended that future studies seek to identify which specific domains would be more associated with depressive conditions, since, for Bandura, self-efficacy is better explained from a specific self-belief to different domains of actions (academic, social, emotional, among others).

Finally, based on the findings of this investigation, it is expected that the discussion about health in adolescence will be expanded, considering that numerous conditions that occur at this stage of development tend to lead to a series of complications in adulthood. It is expected, therefore, that mental health care can be increasingly evidence-based, enhancing actions that promote well-being in this public, through the recognition of protective factors for their health. The findings gathered here demonstrate the notorious role of self-efficacy in understanding depressive symptoms in adolescents, being characterized as a potential focus in the development of interventions aimed at strengthening and developing positive beliefs with this audience.

Funding

Fundação de Apoio à Pesquisa e à Inovação Tecnológica do Estado de Sergipe (FAPITEC/SE).

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Authors' participation: a) Conception and design of the work; b) Data acquisition; c) Analysis and interpretation of data; d) Writing of the manuscript; e) Critical review of the manuscript.
D. N. has contributed in a, b, c, d, e; A. F. in a, b, c, d, e.

Scientific editor in charge: Dra. Cecilia Cracco.