ISSN: 2318-8413 DOI: 10.18554/refacs.v9i1.5203

REFACS

Personality factors and psychopathological aspects of aspiring pilots

Fatores de personalidade e aspectos psicopatológicos de aspirantes a piloto

Factores de personalidad y aspectos psicopatológicos de aspirantes a piloto

Received: 26/08/2020
Approved: 03/01/2021
Published: 27/01/2021

Luis Henrique Paloski[1]
Volney da Silva Ferraz Junior[2]
Camila Rosa de Oliveira[3]
Valéria Gonzatti[4]
Neusa Maria de Oliveira Chardosim[5]
Tatiana Quarti Irigaray[6]

This is a quantitative and cross-sectional survey, conducted in Rio Grande do Sul, Brazil, in 2015, with the objective of comparing personality factors, symptoms of depression, anxiety and stress among undergraduate students in Aeronautical Sciences and other courses. 212 adults participated, with an average age of 23.44 years (SD = 5.05), recruited for convenience. Instruments were used to investigate sociodemographic characteristics, personality factors, depressive symptoms, anxiety and stress. In comparison to students from other courses, the undergraduate students in Aeronautical Sciences had significantly lower scores for neuroticism and depressive symptoms, anxiety and stress. The factors of openness and extroversion were negatively correlated with symptoms of anxiety and stress. The conscientiousness factor was negatively related to symptoms of depression, anxiety and stress. The kindness factor was positively correlated only with symptoms of depression. Considering personality characteristics in the training of pilots is an essential aspect, as they are related to performance and can contribute to reducing the occurrence of aviation accidents or incidents.
Descriptors: Personality; Depression; Anxiety; Pilots.

Esta é uma pesquisa quantitativa e transversal, realizada no Rio Grande do Sul, em 2015, com o objetivo de comparar fatores de personalidade, sintomas de depressão, ansiedade e estresse entre graduandos em Ciências Aeronáuticas e de outros cursos. Participaram 212 adultos, com média de idade de 23,44 anos (*DP* = 5,05), recrutados por conveniência. Utilizou-se instrumentos para investigar características sociodemográficas, fatores de personalidade, sintomas depressivos, de ansiedade e de estresse. Em comparação aos alunos de outros cursos, os graduandos em Ciências Aeronáuticas apresentaram escores significativamente inferiores de neuroticismo e de sintomas depressivos, de ansiedade e de estresse. Os fatores abertura e extroversão correlacionaram-se negativamente com sintomas de ansiedade e estresse. O fator conscienciosidade relacionou-se negativamente com sintomas de depressão, ansiedade e estresse. O fator amabilidade correlacionou-se de maneira positiva apenas com sintomas de depressão. Considerar as características de personalidade na formação de pilotos é um aspecto essencial, pois se relacionam com o desempenho e podem contribuir para a redução na ocorrência de acidentes ou incidentes aeronáuticos.
Descritores: Personalidade; Depressão; Ansiedade; Pilotos.

Esta es una encuesta cuantitativa y transversal, realizada en Río Grande del Sur, Brasil, en 2015, con el objetivo de comparar factores de personalidad, síntomas de depresión, ansiedad y estrés entre los estudiantes de pregrado en Ciencias Aeronáuticas y otros cursos. Participaron un total de 212 adultos, con una edad media de 23,44 años (SD = 5,05), reclutados por conveniencia. Se utilizó instrumentos para investigar las características sociodemográficas, los factores de personalidad, los síntomas depresivos, de ansiedad y de estrés. En comparación con los estudiantes de otros cursos, los estudiantes de Ciencias Aeronáuticas presentaron puntuaciones significativamente más bajas de neuroticismo y de síntomas depresivos, de ansiedad y de estrés. Los factores apertura y extroversión se correlacionaron negativamente con los síntomas de ansiedad y estrés. El factor concienciosidad se relacionó negativamente con los síntomas de la depresión, la ansiedad y el estrés. El factor amabilidad se correlacionó positivamente sólo con los síntomas de la depresión. La consideración de las características de la personalidad en la formación de pilotos es un aspecto esencial, ya que se relacionan con el rendimiento y pueden contribuir a la reducción de la ocurrencia de accidentes o incidentes aeronáuticos.
Descriptores: Personalidad; Depresión; Ansiedad; Pilotos.

1. Psychologist. Specialist in Public Health. Master and PhD in Psychology. Professor at Instituto Meridional (IMED), Passo Fundo, RS, Brazil. ORCID: 0000-0001-6965-3139 E-mail: luishenriquepaloski@gmail.com
2. Bachelor of Aeronautical Sciences. Porto Alegre, RS, Brazil. ORCID: 0000-0001-8008-0490. E-mail: volney.ferraz@gmail.com
3. Psychologist. Specialist in Cognitive Behavioral Therapy. Master in Psychology. PhD in Biomedical Gerontology. Professor at IMED, Passo Fundo, RS, Brazil. ORCID: 0000-0003-2115-604X E-mail: camila.oliveira@imed.edu.br
4. Psychologist. Specialist in Neuropsychology. Master in Psychology. PhD student in Psychology at the Pontífice Universidade Católica do Rio Grande do Sul (PUC-RS), Porto Alegre, RS, Brazil. ORCID: 0000-0002-9545-8334 E-mail: valeriagonzatti@gmail.com
5. Psychologist. Specialist in Neuropsychology. Master in Biomedical Gerontology. Visiting Professor at Projecto - Soluções em Psicologia, Porto Alegre, RS, Brazil. ORCID: 0000-0003-2710-3125 E-mail: neusachardosim@hotmail.com
6. Psychologist. Specialist in Neuropsychology. Master and PhD in Biomedical Gerontology. Professor at PUC-RS, Porto Alegre, RS, Brazil. ORCID: 0000-0002-6824-5448. E-mail: tatiana.irigaray@pucrs.br

INTRODUCTION

Pilots are a highly selected and distinct occupational group, since their mistakes can lead to significant costs to human life, international relations and national security. Thus, due to the high costs of training and the high risk involved in the process of flying, understanding their personality characteristics is an essential part of the selection process[1].

The pilot's performance is influenced by personality factors that can directly interfere in their way of reacting to situations of their work activity, and may even contribute to the occurrence of accidents and/or aeronautical incidents[2]. Personality factors are also important in interpersonal relationships and teamwork, manifesting themselves in management of an airline crew and in the successful result of flights[3].

Personality, among countless definitions, can be conceptualized as the set of characteristics of the individual, distinguishing them from others based on relatively constant and stable patterns of behavior, feelings and thoughts[4]. The personality assessment, based on the Big Five Factors (OCEAN) model, includes the dimensions of Openness to Experience, Consciousness or Realization, Extroversion, Agreeableness or Socialization and Neuroticism, and is shown to be one of the most comprehensive models used by professionals to evaluate the personality[5,6].

According to the OCEAN model, the Openness to experience factor is related to exploratory behaviors, creativity, aesthetic sensitivity, intellectual curiosity and the need for variety. The Conscientiousness factor is related to goals and values, the degree of organization, persistence and obstinacy to achieve objectives. The Extroversion factor is related to sociability and liveliness. The Agreeableness is related to experiences of trust, altruism and sympathy. The Neuroticism factor refers to experiences of tension, manifested in experiences of anxiety, anger, depression and affections related to anguish[5,6].

Aspiring pilots have a tendency to be more outgoing than the general population[7,8] emotionally stable, with low levels of anxiety, vulnerability, hostility, impulsivity and depression. In general, they are conscious, self-confident, with good critical judgment, seek goals, and are open to new experiences[9].

Compared to the general population, pilots have higher levels of Conscientiousness and lower levels of Neuroticism, showing greater confidence, perseverance and conviction[7]. There is still no consensus on the most suitable personality profile for pilots, however, as incompatible characteristics, dependence and avoidance, can be classified as a threat to flight safety[1]. The Conscientiousness factor is the strongest predictor of pilots' performance, characterizing determined individuals, with defined purposes and willpower[10].

In addition to personality factors, other variables can influence pilots' performance, such as working conditions and their emotional aspects, which can lead to pilots' mental health issues, becoming a threat to flight safety[11]. One study showed that 13.5% of pilots reached scores for depression and 4.1% reported having thoughts of suicide in the last two weeks[12]. Another[13] revealed that pilots who spent long hours on duty per week were twice as likely to feel depressed or anxious. Work-related sleep disorders and fatigue may explain the greater likelihood of these pilots feeling depressed or anxious.

Pilots can also suffer adverse effects under stress, presenting psychological complaints and muscle pain[14]. A study conducted with 109 airline pilots found a prevalence of mental and emotional disorders at 39.4%, showing that work stress and family tensions are risk factors for mental health[13]. Another study found a prevalence of 12.6% of depressive symptoms in this group[12].

The discussion on mental health is not a new topic among pilots, however, there is resistance in the identification of symptoms and mental disorders, and adherence to treatment, due to the belief that the admission of a disease may harm the professional career[12]. However, it is clear that the performance of pilots seems to be related to personality factors and the presence or absence of psychopathologies, aspects that can both contribute to flight safety and

to the occurrence of air accidents[1,11]. Thus, this study aimed to compare personality factors, symptoms of depression, anxiety and stress among undergraduate students in Aeronautical Sciences and other courses.

METHOD

This is a quantitative and transversal research, carried out in the state of Rio Grande do Sul, in 2015, with graduates recruited for convenience, in a bachelor's degree in Aeronautical Sciences and students from other courses at a private higher education institution.

The participants were divided into two groups: the *Aspiring Pilots* group (specific to the bachelor's degree in Aeronautical Sciences) and the *Control* group (students from other courses at the same institution), with the same number of participants in both groups; however, seeking to compare students from different courses, but with a similar sociodemographic profile, to that of Aeronautical Sciences.

The *Sociodemographic Data Sheet* was applied, which included: age, gender and marital status, semester of the course, housing situation, physical and mental health status, use of medication, use of alcohol and tobacco (quantity and frequency).

The *Five Great Personality Factors Inventory* (IGFP-5)[15,16] was used, which is a brief self-report measure, designed to assess the five major personality factors. It consists of 44 items, structured in simple sentences and answered on a five-point Likert-type response scale (1 = *Strongly disagree* to 5 = *Strongly agree*). In the Brazilian context, the instrument has a reliability coefficient (utt2 of Guttman), ranging from 0.68 to 0.7615.16.

The *Depression, Anxiety and Stress Scale* (DASS-21) was also part of the assessment, which assesses symptoms of depression, anxiety and stress. It consists of 21 items (7 items for each assessed area) on a 4-point Likert scale (from 0 = *nothing applies to me* to 3 = *applied most of the time*)[17,18]. Each item consists of a statement about negative emotional symptoms and the participant must mark how much each statement has been applied to him during the last week.

The data were analyzed using the IBM-SPSS statistical package, version 22. Descriptive statistics (mean, standard deviation and percentage) and inferential were used. Data distribution was verified using the Kolmogorov-Smirnov test. Initial comparisons between the variables age, IGFP-5 and DASS 21 were performed using Student's t-test for independent samples, and categorical variables using Chi-square. Analysis of covariance (ANCOVA) was performed to investigate personality factors and symptoms of depression, anxiety and stress between groups.

The effect size of the significant differences in the age, IGFP-5 and DASS-21 variables between the groups was investigated by means of Cohen's *d*, and associations between these variables were verified through partial correlation. The magnitude of Cohen's *d* and the strength of the associations were interpreted as weak/small for values ≤ 0.200, moderate/medium for values ≥ 0.500 and strong/high for values ≥ 0.800, specifically for Cohen's *d* values equivalent to ≥ 1,300 a magnitude was interpreted as very high20. Significant results were considered if $p < 0.05$.

The research was approved by the Research Ethics Committee under CAAE 47545715.0.0000.5336. Data collection was carried out online, using an electronic questionnaire developed on the Qualtrics platform, which was sent to the students' academic e-mail.

RESULTS

212 adults aged 18 to 38 years participated (M = 23.44; SD = 5.05). The average age of the *Aspiring Pilots* group was 21.14 years (SD = 2.68) and of the *Control* group of 25.75 years (SD = 5.78). The *Aspiring Pilots* group was composed of 97 men (92%) and nine women (8%), and the *Control* group included 31 men (29%) and 75 women (71%). Regarding marital status,

in the *Aspiring Pilots* group, 3% (n = 3) were married and 97% (n = 103) were single or divorced; while in the *Control* group, 14% (n = 15) were married and 86% (n = 91) were single or divorced.

The groups differed significantly in terms of age (F = 68.52; t = -7.44; p ≤ 0.001), gender ($\chi 2 = 85.88$; p ≤ 0.001) and marital status ($\chi 2 = 8.74$; p = 0.003). Thus, the analysis of covariance (ANCOVA) controlled the effect of these variables when comparing the groups regarding personality factors, depressive symptoms, anxiety and stress (Table 1).

Table 1. Comparison between groups regarding personality factors, depressive symptoms, anxiety and stress. Rio Grande do Sul, 2015.

	Aspiring pilots		Control		*F*	*p**	*Observed power*	Cohen's *d*
	M	*DP*	*M*	*DP*				
IGFP-5								
Openness	35.86	5.22	35.67	4.36	1.49	0.223		
Neuroticism	19.64	5.53	24.58	3.15	29.94	≤ 0.001	1.00	-1.10
Extroversion	26.58	6.28	27.87	3.11	2.20	0.140		
Conscientiousness	33.92	4.97	32.81	3.84	3.19	0.076		
Agreeableness	33.20	3.26	32.91	3.16	0.22	0.637		
DASS-21								
Depression	3.30	2.86	4.42	4.76	10.69	≤ 0.001	0.90	-0.29
Anxiety	2.81	3.13	3.29	3.93	9.96	0.002	0.88	-0.14
Stress	2.53	2.83	7.44	4.32	69.98	≤ 0.001	1.00	-1.35

Key : *df* = 210; IGFP-5 = Inventory of the Big Five Personality Factors; DASS-21 = Depression, Anxiety and Stress Scale, short version; * = Comparison between groups based on covariance analysis (ANCOVA).

In relation to personality factors, *Aspiring Pilots*, compared to *Control*, showed significantly lower scores in Neuroticism (very high magnitude), suggesting greater emotional stability. However, in other factors, the groups had similar performance. In mood symptoms, when compared to the *Control* group, the *Aspiring Pilots* group obtained significantly lower scores for depressive symptoms (small magnitude), anxiety (small magnitude) and stress (very high magnitude). The associations between personality factors and mood symptoms are shown in Table 2.

According to the results of the partial correlations, controlling for the effect of age, gender and marital status, the five personality factors assessed by the IGFP-5 showed significant relationships with most symptoms of mood, anxiety and stress in the *Aspiring Pilots* group (weak to moderate magnitudes). However, in the *Control* group, only the Neuroticism factor demonstrated a positive and weak association with all DASS-21 scores, suggesting that higher levels of emotional instability are related to a higher occurrence of depressive symptoms, anxiety and stress.

Table 2. Partial correlations between the IGFP-5 and DASS-21 scores. Rio Grande do Sul, 2015.

	IGFP-5				
	Openness	**Neuroticism**	**Extroversion**	**Conscientiousness**	**Agreeableness**
Aspiring pilots					
DASS-21					
Depression	-0.06	0.56***	-0.11	-0.34***	0.33***
Anxiety	-0.23*	0.56***	-0.32***	-0.36***	0.11
Stress	-0.29**	0.58***	-0.29**	-0.24*	0.16
Control					
DASS-21					
Depression	-0.12	0,27**	-0.19	-0.09	-0.01
Anxiety	-0.18	0.20*	-0.13	-0.11	0.02
Stress	0.06	0.31***	0.05	-0.09	0.14

Key: IGFP-5 = Inventory of the Big Five Personality Factors; DASS-21 = Depression, Anxiety and Stress Scale, short version; * = $p < 0.05$; ** = $p \leq 0.01$; *** = $p \leq 0.001$.

DISCUSSION

Lower scores on Neuroticism suggest lower levels of anxiety, frustration, loneliness, worry and fear in the group of *Aspiring Pilots*[21]. This finding corroborates other investigations that point to the prevalence of low levels of Neuroticism in pilots and soldiers, who are considered professionals who sometimes need to make decisions in seconds and also suppress natural responses to fear to maintain an adequate level of functioning[1, 22]. A study of 9,641 aeronautical science students in the United States corroborates these results, showing that students selected for training as pilots scored below average in the traits of Neuroticism and Agreeableness when compared to the scores of the general population[1].

Another result found in the present study indicated that the group of aeronautical science students obtained significantly lower scores for depressive symptoms, anxiety and stress. These results corroborate previous studies, which also found low levels of depression and anxiety in pilots or aspiring pilots[7,9].

A study carried out by the National Aeronautics and Space Administration (NASA) characterizes the basic personality profile for a pilot as emotionally stable, assertive, with low levels of anxiety, vulnerability, hostility, impulsivity and depression[9]. Thus, it can be inferred that the aspiring pilots evaluated showed greater emotional stability, that is, lower levels of Neuroticism, typically characterized by low levels of anxiety, worry, depression, anger and irritability, compared to the general population.

The five personality traits evaluated showed significant relationships with the symptoms of depression, anxiety and stress in the group of aspiring pilots. Openness and Extroversion traits were negatively correlated with anxiety and stress symptoms. Thus, the more sociable, creative, intellectually curious and with exploratory behaviors the aspiring pilots are, the less symptoms of anxiety and stress they presented.

The Conscientiousness trait was negatively related to symptoms of depression, anxiety and stress. Thus, the more goals, organization, persistence and obstinacy to achieve goals, the less expression of symptoms of depression, anxiety and stress.

It was found that, both in the *Aspiring Pilots* group and in the *Control* group, the Neuroticism trait demonstrated a positive association with symptoms of depression, anxiety and stress, which suggests a relationship between Neuroticism and these symptoms in the two groups evaluated. Another study also found an association between high levels of neuroticism and a greater perception of stress and depressive symptoms[23].

Personality is an important factor to be considered when evaluating symptoms of depression, anxiety and stress, since certain types of traits (such as greater Neuroticism) can lead to emotional dysregulation or maladaptive reactivity to stress, which increases predisposition to depressive and anxiety symptoms[23].

According to research, graduates are vulnerable to the development of psychopathological disorders, showing high levels of anxiety, stress and depression symptoms[24,25]. Given this relationship between illness and academic aspects, it is necessary to conduct further studies and establish protocols for the early detection of psychopathological symptoms and psychological support services for students[24] regardless of the course.

As Neuroticism has been identified as an important mental health indicator, it is suggested that the personality traits of university students be evaluated, including interventions aimed at reducing levels of Neuroticism, which would indirectly lead to an increase in their levels of well-being and decrease of symptoms of depression, anxiety and stress.

CONCLUSION

The results of the present study allow us to conclude that aspiring airline pilots had lower scores than those graduating from other courses in the Neuroticism trait and a lower prevalence of symptoms of depression, anxiety and stress. In addition, it was found that the

Neuroticism trait showed a positive association with symptoms of depression, anxiety and stress. Also, Openness and Extroversion were negatively correlated with symptoms of anxiety and stress. Conscientiousness was negatively related to the symptoms of depression, anxiety and stress.

Among the limitations, it is noteworthy that this study was conducted with a sample of aspiring pilots from only one Aeronautical Sciences course. The divergence between the *Control* group regarding gender and age are also limitations of the research. The scarcity of current works to discuss the findings was another limitation.

Thus, it is suggested that future research should include samples of aspiring pilots from more Aeronautical Sciences courses. New studies may also aim at the development and development of flight training, programs and teaching styles for this specific population, based on the association between personality traits and psychopathological aspects.

REFERENCES

1. Carretta TR, King RE, Ree MJ, Teachout MS, Barto E. Compilation of cognitive and personality norms for military aviators. Aerosp Med Hum Perform. [Internet]. 2016 [citaed in 29 Nov 2020]; 87(9):764-71. DOI: 10.3357/AMHP.4545.2016

2. Makarowski R, Piotrowski A. The psychological profile of pilots of passenger planes: analysis of temperamental traits, aggression and risk. Med Pr. [Internet]. 2017 [cited in 20 Oct 2020]; 68(5):639-51. Available from: https://pubmed.ncbi.nlm.nih.gov/28656985. DOI:10.13075/mp.5893.00444

3. Ohlander U, Alfredson J, Riveiro M, Falkman G. Fighter pilots' teamwork: a descriptive study. Ergonomics [Internet]. 2019 [cited in 29 Nov 2020]; 62(7):880-90. DOI: 10.1080/00140139.2019.1596319

4. Chopik WJ, Kitayama S. Personality change across the life span: insights from a cross-cultural, longitudinal study. J Personal. [Internet]. 2018 [cited in 30 Nov 2020]; 86(3):508-21. DOI: 10.1111/jopy.12332

5. Mezquita L, Bravo AJ, Morizot J, Pilatti A, Pearson MR, Ibáñez MI, et al. Cross-Cultural examination of the Big Five Personality Trait Short Questionnaire: measurement invariance testing and associations with mental health. PLoS One [Internet]. 2019 [cited in 30 Nov 2020]; 14(12):e0226223. DOI: 10.1371/journal.pone.0226223

6. Widiger TA, Crego C. The Five Factor Model of personality structure: an update. World Psychiatry [Internet]. 2019 [cited in 30 Nov 2020]; 19(3):271-72. DOI: https://doi.org/10.1002/wps.20658

7. Dillinger TG, Wiegmann DA, Taneja N. Relating personality with stress coping strategies among student pilots in a collegiate flight-training program. In: Jensen RS, organizer. Proceedings of the 12th International Symposium on Aviation Psychology. Dayton: The Ohio State University; 2003. p. 1-4.

8. Ramachandran N, Wadhawan JM, Kumar V, Chandramohan V, Rao PLN. Personality profile of an IAF Pilot: its usefulness in pilot selection. Aviation Med. [Internet]. 1983 [cited in 20 Oct 2020]; 21(2):131-9.

9. Fitzgibbons A, Davis D, Schutte PC, organizers. Pilot personality profile using the NEO-PI-R. National Aeronautics and Space Administration (NASA). Virginia: Langley Research Center Hampton; 2004. p. 1-16.

10. Siem FM, Murray MW. Personality factors affecting pilot combat performance: a preliminary investigation [Internet]. Lindbergh Drive: Aircrew Training Reserch Division, Aircrew Performance Branch; 1997 [cited in 20 Oct 2020]. 12p. (United States Air Force Armstrong Laboratory). Available from: https://apps.dtic.mil/dtic/tr/fulltext/u2/a459823.pdf

11. Mulder S, Rooy D. Pilot mental health, negative life events, and improving safety with peer support and a just culture. Aerosp Med Hum Perform. [Internet]. 2018 [cited in 29 Nov 2020]; 89(1):41-51. DOI: 10.3357/AMHP.4903.2018
12. Wu AC, Donnelly-McLay D, Weisskopf MG, McNeely E, Betancourt TS, Allen JG. Airplane pilot mental health and suicidal thoughts: a cross-sectional descriptive study via anonymous web-based survey. Environ Health. [Internet]. 2016 [cited in 29 Nov 2020]; 15(1):121. DOI: 10.1186/s12940-016-0200-6
13. O'Hagan AD, Issartel J, Nevill AM, Warrington G. Flying into depression: pilot's sleep and fatigue experiences can explain differences in perceived depression and anxiety associated with duty hours. Workplace Health Saf. [Internet]. 2016 [cited in 20 Oct 2020]; 65(3):109-117. DOI: 10.1177/ 2165079916659506
14. Omholt ML, Tveito TH, Ihlebæk C. Subjective health complaints, work-related stress and self-efficacy in Norwegian aircrew. Occup Med. [Internet]. 2017 [cited in 20 Oct 2020]; 67(2):135-42. DOI: 10.1093/occmed/kqw127
15. John OP, Donahue EM, Kentle RL, organizers. The Big Five Inventory: versions 4a and 54. Berkeley: Berkeley Institute of Personality and Social Research; 1991.
16. Andrade JM. Evidências de validade do Inventário dos Cinco Grandes Fatores de Personalidade para o Brasil. [tese]. Brasília, DF: Universidade de Brasília/UnB; 2008. 169p.
17. Lovibond SH, Lovibond PF, organizers. Manual for the depression anxiety stress scales. Sydney: Psychology Foundation; 1995.
18. Vignola RC, Tucci AM. Adaptation and validation of the Depression, Anxiety and Stress Scale (DASS) to Brazilian portuguese. J Affect Disord. [Internet]. 2014 [cited in 29 Nov 2020]; 155:104-9. DOI: 10.1016/j.jad.2013.10.031
19. Apóstolo JLA, Mendes AC, Azeredo ZA. Adaptação para a língua portuguesa da Depression, Anxiety and Stress Scale (DASS). Rev Latinoam Enferm. [Internet]. 2006 [cited in 29 Nov 2020]; 14(6):863-71. DOI: 10.1590/S0104-11692006000600006
20. Rosenthal JA. Qualitative descriptors of strength of association and effect size. J Soc Serv Res. [Internet]. 1996 [cited in 29 Nov 2020]; 21(4):37-59. DOI: http://dx.doi.org/10.1300/J079v21n04_02
21. Gao Y, Kong S. Personality types of pilot students: a study of an australian collegiate aviation program. Int J Aviat Aeronaut Aerosp. [Internet]. 2016 [cited in 29 Nov 2020]; 3(3):6. DOI: 10.15394/ijaaa.2016.1130
22. Klee S, Renner K-H. Beyond pride and prejudices: an empirical investigation of German Armed Forces soldiers' personality traits. Pers Individ Dif. [Internet]. 2016 [cited in 29 Nov 2020]; 88:261-6. DOI: 10.1016/j.paid.2012.11.006
23. Kim SE, Kim HN, Cho J, Kwon MJ, Chang Y, Ryu S, et al. Direct and indirect effects of five factor personality and gender on depressive symptoms mediated by perceived stress. PLoS One [Internet]. 2016 [cited in 29 Nov 2020]; 11(4):e0154140. DOI: 10.1371/journal.pone.0154140
24. Ariño DO, Bardagi MP. Relação entre fatores acadêmicos e a saúde mental de estudantes universitários. Revista Psicologia em Pesquisa [Internet]. 2018 [cited in 07 Jan 2021]; 12(3):44-52. DOI: 10.24879/2018001200300544
25. Guedes AF, Rodrigues VR, Pereira CO, Sousa MNA. Prevalência e correlatos da depressão com características de saúde e demográficas de universitários de medicina. Arq Ciênc Saúde [Internet]. 2019 [cited in 07 Jan 2021]; 26(1):47-50. DOI: https://doi.org/10.17696/2318-3691.26.1.2019.1039

ACKNOWLEDGEMENTS
To the collaborators Aline Sória Pereira, Elisa Arrienti Ferreira, Dalton Breno Costa, Manuela Polidoro Lima and Marianne Farina who helped in the construction of this article.

CONTRIBUTIONS
Luis Henrique Paloski and **Volney da Silva Ferraz Junior** contributed to the concept, design, analysis and interpretation of the data. **Camila Rosa de Oliveira** collaborated in the analysis and interpretation of the data. **Valéria Gonzatti** and **Neusa Maria de Oliveira Chardosim** wrote the article. **Tatiana Quarti Irigaray** participated in the writing and review.

How to cite this article (Vancouver)
Paloski LH, Ferraz Junior VS, Oliveira CR, Gonzatti CR, Chardosim NMO, Irigaray TQ. Personality factors and psychopathological aspects of aspiring pilots. REFACS [Internet]. 2021 [cited in *insert day, month and year of access*]; 9(1):54-61. Available from: *insert access link*. DOI: *insert DOI link.*

How to cite this article (ABNT)
PALOSKI, L. H.; FERRAZ JUNIOR, V. da S.; GONZATTI, V.; CHARDOSIM, N. M. de O.; IRIGARAY, T. Q. Personality factors and psychopathological aspects of aspiring pilots. **REFACS**, Uberaba, MG, v. 9, n. 1, p. 54-61, 2021. DOI: *insert DOI link.* Available from: *insert access link*. Access in: *insert day, month and year of access*.

How to cite this article (APA)
Paloski, L.H., Ferraz Junior, V.S., Oliveira, C.R., Gonzatti, V., Chardosim, N.M.O., & Irigaray, T.Q. (2021). Personality factors and psychopathological aspects of aspiring pilots. *REFACS*, 9(1), 54-61. Retrieved in *insert day, month and year of access* from *insert access link*. DOI: *insert DOI link*.