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PREVENTION OF ONLINE ADDICTIVE BEHAVIOURS IN THE PORTUGUESE ARMED FORCES: A CASE STUDY ON THE PORTUGUESE AIR FORCE[1]

PREVENÇÃO DOS COMPORTAMENTOS ADITIVOS ONLINE NAS FORÇAS ARMADAS PORTUGUESAS: O ESTUDO DE CASO DA FORÇA AÉREA

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Abstract

There are several risks associated with the Internet, such as the emergence of patterns of use that resemble addictive disorders. Because addictive behaviours can have a negative impact on military readiness, it is essential to understand the prevalence of online addictive behaviours (OAB) in the Armed Forces (AAFF). This study assessed the possibility of extending the measures to prevent addictive behaviours used in the Portuguese Air Force (PoAF) to include OAB. To that end, this work analyses both the methods used to prevent OAB and addictive behaviours in the PoAF. The study used inductive reasoning, a quantitative research strategy with qualitative elements and a case study design. Data were collected through a literature review, content analysis of semi-structured interviews with eight stakeholders involved in the prevention of addictive behaviours in the military, and statistical analysis of the responses of 766 service members (12.97% of the universe) to a

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[1] Article adapted from the individual research work carried out for the Field Grade Officers Course. The defence took place in 25 July 2022 at the Military University Institute. The full version of the paper is available from Portugal's Open Access Scientific Repositories (RCAAP).

questionnaire on their online behaviours and levels of addiction. The findings revealed that the PoAF has implemented specific preventive measures to address OAB, and that severe levels of addiction to the Internet were found in 0.3% of the service members in the study sample and mild and moderate levels of addiction were found in 27% of the sample, which suggests that the PoAF would benefit from implementing an OAB prevention model such as the one proposed in this study.

Keywords: Online addictive behaviours; Armed Forces; Prevention of online addictive behaviours.

Resumo

A Internet *acarreta potenciais perigos, como o estabelecimento de padrões de utilização próximos de quadros aditivos. Considerando o impacto negativo dos comportamentos aditivos em contexto militar, é fundamental conhecer a sua realidade concernente aos comportamentos aditivos* online *(CAO). Este estudo teve, assim, por objetivo avaliar a adequabilidade de alargar a metodologia preventiva de comportamentos aditivos aplicada na Força Aérea (FA) à sua expressão* online*, analisando as metodologias preventivas de CAO e os comportamentos aditivos na FA. Este estudo teve, assim, por objetivo avaliar a adequabilidade de alargar a metodologia preventiva de comportamentos aditivos aplicada na Força Aérea (FA) à sua expressão online, analisando as metodologias preventivas de CAO e os comportamentos aditivos na FA. Alicerçado numa metodologia de raciocínio indutivo, baseado numa estratégia de investigação quantitativa com reforço qualitativo e num desenho de estudo de caso, os dados foram recolhidos através de análise documental, análise de conteúdo de entrevistas semiestruturadas a oito entidades intervenientes na prevenção de comportamentos aditivos em meio castrense, e análise estatística das respostas de 766 militares (12,97% do universo) a um questionário caracterizador de comportamentos* online *e associado nível de adição. Dos resultados, concluiu-se que na FA existem pontuais ações preventivas de CAO e na amostra estudada uma prevalência de 0,3% de adição severa à* Internet *e 27% de adição ligeira e moderada, afigurando-se desejável a prevenção de CAO na FA e propondo-se um modelo de intervenção desenhado "à medida" da avaliação realizada.*

Palavras-chave: *Comportamentos aditivos* online*; Forças Armadas; Prevenção dos comportamentos aditivos* online.

1. Introduction

In today's Western societies, the Internet is a fundamental part of people's lives, and its capabilities can be used in beneficial and empowering ways in almost all areas of life (Stepien, 2014).

As devices become more powerful and smaller (and, therefore, more portable) (Musetti & Corsano, 2018) and access to the Internet becomes increasingly more affordable, this tool is taking on a ubiquitous role in everyday life. The pandemic situation that has persisted since 2020 has led to an increased use of digital resources, and the time spent online and / or in front of screens playing games increased during the lockdowns to contain the COVID19 pandemic (General Directorate for Intervention on Addictive Behaviours and Dependencies [*Serviço de Intervenção nos Comportamentos Aditivos e Dependências*] – SICAD, n.d.).

Therefore, despite its undeniable advantages, the Internet poses a number of temptations and risks to its users (Stepien, 2014), who can develop problematic and / or disruptive patterns of use / behaviour that have a negative impact on their habits, academic and / or work performance, family life and emotional state (Patrão & Sampaio, 2016).

Because these patterns have similarities with the symptoms of addictive illnesses, both related and unrelated to substance use, when they are associated with uncontrolled and harmful Internet use, they are considered an "Internet addiction" (Young, 2009).

The World Health Organization has acknowledged the significant impact of this problem at progressively younger ages and classified it as a public health problem (World Health Organization [WHO], 2014, cited in Jo et al., 2019), stressing the importance of prevention. However, these efforts have been hindered by the scarcity of studies that support the development and / or implementation of solid effective methodological approaches (King et al., 2018).

The military are aware of this reality, and several studies have already been developed on the prevalence / assessment and prevention of this problem in military organizations, notably in the United States of America (U.S.) (Breslau, Aharoni, Pedersen, & Miller, 2015; Miller, Martin, Yeung, Trujillo, & Timmer, 2014; Schmidt et al., 2019). These studies are especially important in this type of organization because addictive behaviours have a negative impact on discipline, operationality and military security, and may have serious consequences for both the missions and the reputation of the Armed Forces (Decision No. 11921/2015 of 23 October).

The Portuguese Armed Forces (AAFF) are naturally aware of this issue, and have implemented a Programme for the Prevention of Addictive Behaviours and Addictions in the Armed Forces (PPCACDFA) to address it. The most recent version of the programme was established by Decision No. 11921/2015 (pp. 30683-30685), issued by the Deputy Minister of National Defence. The document proposes a set of stakeholders and prevention axes, levels and actions which aim to promote moderation in the consumption of alcoholic beverages, abstinence from the consumption of illegal psychoactive substances and anabolic steroids, a reduction in tobacco consumption, and to prevent addictive behaviours such as

> [...] gambling and addictive games. [these] technological advances [have provided] new types of games supported by interactive platforms, which allow users to acquire pre-programmed console games as well as online games accessible virtually 24 hours a day.

However, the document does not provide any more information on the issue of online addictive behaviours (OAB), nor does it include any actions or measures to address them.

Therefore, studies are needed to analyse online addictive behaviours among AAFF personnel, and specifically among Air Force (PoAF) personnel (the study will be spatially delimited to this branch of the AAFF), and to assess the possibility of preventing and / or reducing those behaviours.

This study on how to prevent online addictive behaviours is delimited, as advised by Santos and Lima (2019):

– Temporally, to the present time (until June 2022);

– Spatially, to the PoAF;

– In terms of content, to the prevention of online addictive behaviours (in the PoAF).

The study's General Objective (GO) is *To assess the possibility of extending the measures implemented in the Portuguese Air Force to prevent addictive behaviours to online addictive behaviours*. To achieve it, two Specific Objectives (SO) were defined:

SO1: To analyse the prevention of addictive behaviours in the Air Force;

SO2: To analyse the prevalence of online addictive behaviours among Air Force personnel.

These objectives will be achieved by answering the Research Question (RQ): *Should the measures implemented in the Portuguese Air Force to prevent addictive behaviours be extended to online addictive behaviours?*

2. Theoretical and conceptual framework

This chapter contains the literature review and the analysis model used in the study.

2.1. State-of-the-art on online addictive behaviours

The key concept addressed in this study, "online addictive behaviours", is analysed below in terms of its operationalisation, prevalence, associated risk factors, impact and prevention.

2.1.1. Operationalisation

Addictive behaviours. Before defining the key concept of this study, the meaning of "addictive behaviours" must be clarified. For Tao et al. (2010), it means the "moment" when someone is no longer able to control the amount or frequency of behaviours that were previously "harmless", such as work, sex, gaming or gambling, Internet use, shopping and/ or physical exercise.

In the definition proposed by the SICAD (2013), addictive behaviours are conceptualised as "processes of addiction", which are defined as behaviours

> [...] with impulsive-compulsive features related to different activities or actions, such as: using psychoactive substances, gambling, Internet, sex, shopping, etc., which have the potential for pleasure. When this type of behaviour persists over time and is accompanied by other neurobiological, psychological, genetic and environmental factors, it may become an addiction. [This addiction consists of a] set of physiological,

> cognitive and behavioural phenomena which may develop (for example) after repeated use of a substance. In the case of psychoactive substances, addiction involves an intense craving to consume the substance, loss of control over its use, continuing to consume it even when other activities and obligations are affected, increased tolerance and withdrawal symptoms. (SICAD, 2013, p. 10)

Online addictive behaviours. In the last decade of the 20th century, references to OAB (referred to as "Internet Addiction") began to appear in psychology literature to describe patients who seemed to be addicted to the Internet, in a similar manner as people who had addictions to drugs or alcohol which hindered their academic, social and work life (Young, 1998). Since then, further studies and literature have been published on this topic but there seems to be no consensus on the matter. There is an abundance of descriptive identifiers for the conditions presented by patients with different types of dysfunctional patterns of Internet use, from excessive or inappropriate use to patterns of addictive behaviours or addictions (Stepien, 2014). In this study, these terms and their different conceptualisations will be referred to as "online addictive behaviours".

Additionally, the variety of behaviours that fall under the same description has raised the question of whether OAB refer to the dysfunctional use of certain online resources or to Internet use in general (Patrão & Sampaio, 2016), i.e. whether they refer to *addiction to resources on the Internet* or *addiction to the Internet*, respectively (Griffiths et al., 2016).

To systematise the specific behaviours that fall under the designation OAB, several authors have distinguished different types of disruptive behaviours. Vally, Laconi and Czeremska (2020) have listed a set of behaviours associated with problematic Internet use: compulsive playing of video games, compulsive online gambling, compulsive shopping, compulsive viewing of pornography, compulsive sending of emails or text messages and excessive use of social networks (Vally, et al, 2020).

Due to the controversy around this issue and the lack of a solid scientific corpus, OAB are not yet recognised as a mental disorder in the two most current manuals on this subject – the 5th edition of the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-V) of the American Psychiatric Association and the 11th revision of the *International Classification of Diseases* (ICD-11) of the World Health Organization –, which only mention online game activities (Jo et al., 2019).

Despite these different perspectives and conceptualisations, two aspects are increasingly recognised by the scientific community.

The first is the manifestation of a common behaviour pattern that closely resembles addictions, which is all the more complex because it is often difficult to detect and diagnose, as compulsive and uncontrollable use of the Internet is masked by its normal use for legitimate personal and / or work purposes (Young, 2009). This pattern is usually characterised by the following (Tao et al., 2010; Wölfling, Beutler, Dreier & Müller, 2014):

– Excessive preoccupation with online activities;

– Impulsive or irresistible urge to spend time online (craving);

– Increase in the number of hours spent online (tolerance);

– Irritability and feelings of unease when the Internet is not available (withdrawal);

– Inability to discontinue online activities despite the harmful consequences;

– Inability to control the time spent online (loss of self-control);

– Lack of interest in social life and other activities that used to be enjoyable;

– Using the Internet as a way to alleviate negative emotions;

– Hiding the time and money spent online from family and friends.

The second refers to the importance of studying this issue, which is increasingly seen as a public health problem (WHO, 2014, cited in Jo et al., 2019) that causes significant harm, therefore, preventing it is considered essential (Lopez-Fernandez & Kuss, 2020).

Despite the lack of a common, precise and concise definition, the issue of Internet addiction is, as stated above, a relevant and timely topic of study. This study uses the definition proposed by Patrão et al. (2016, cited in Patrão, 2019, p. 26), which describes "online addiction" (or OAB) as being "characterised by excessive involvement in non-essential activities online, with a frequency and intensity that have negative emotional and social consequences, with an impact on academic and / or job performance".

2.1.2. Prevalence

The lack of agreement on a conceptualisation of OAB has led researchers to use different methodologies to assess the issue. Furthermore, there are discrepancies in the data on how prevalent the problem is. Nevertheless, the general consensus is that these behaviours are increasing (Costa & Patrão, 2016).

Studies on the impact of this issue on Portuguese society have revealed that:

– In a sample of adolescents and young adults, 1.2% showed signs of Internet addiction (Pontes, Patrão, & Griffiths, 2014);

– In a sample of adults, 16% had mild levels of addiction, 6% had moderate levels and 0.3% had severe levels (Água, Patrão & Leal, 2018);

– In a sample of the Portuguese population (aged 15 to 74,), 1% had moderate levels of Internet addiction and 0.1% had severe levels (Ribeiro, 2022).

A study that assessed the online behaviours of young adults participating in the National Defence Day in 2019 (Ribeiro, 2022) found that:

– 58.3% of the sample (mainly male) used online games and 17.2% used online gambling websites;

– 97% of the sample (mainly female) stated that they use the Internet to access social networks.

Other studies conducted in the military revealed that:

– 6% of US Air Force personnel show signs of problematic Internet use (Miller et al., 2014);

– 5.5% of military medical and nursing students report moderate to high degrees of Internet addiction (Schmidt et al., 2019).

– 0.4% of Greek Army personnel show signs of Internet addiction and 12% use online gambling platforms (Giotakos et al., 2017).

2.1.3. Risk factors

Studies have shown that a set of sociodemographic factors are considered risk factors for the development of OAB, including:

– Being male (gender) (Naskar, Victor, Nath & Sengupta, 2016; Patrão, 2016; Pontes et al., 2014; Ribeiro, 2022; Tao et al., 2010);

– Belonging to younger age groups (Naskar et al., 2016; Pontes et. al., 2014; Ribeiro, 2022; Young, 2011a), with the 12-17 and 18-29 age brackets being particularly at risk (Anderson et al., 2017, cited in Saletti Van den Broucke & Chau, 2021);

– Being a student (university students are also an at-risk group) (Chak & Leung, 2004, cited in Baturay & Toker, 2019; Kandell, 1998, cited in Huang et al., 2009).

The literature also identifies risk factors related to the availability of Internet access, which include:

– Easy access to the Internet and to devices that connect to the internet (Naskaret al., 2016; Patrão, 2016; Tao et al., 2010);

– Access to games (Ko, Yen, Yen, Lin & Yang, 2007, cited in Blinka & Smahel, 2011; Tao et al., 2010);

– The amount of time spent online, despite not being a factor of addiction, per se, has been identified as a risk factor (Ko et al., 2007, cited in Blinka & Smahel, 2011; Naskar et al., 2016; Patrão, 2016) or as a "warning signal" for problems in this area (Vayre & Vonthron, 2019).

Studies that specifically addressed gambling in the military have shown that its increased availability through online platforms using personal mobile devices, which evade the restrictions that limit access to this type of content through military networks, is a concern and a risk factor (Maas & Nower, 2021; Paterson, Whitty & Leslie, 2020), especially because this population is more likely to engage in risk-taking behaviours and because their leisure activities are often restricted (Maas & Nower, 2021).

2.1.4. Consequences

Studies have shown that disruptive use of the Internet has a negative impact (which can be more or less severe) in various areas, such as daily routines, academic and / or work performance, family life; emotional state, physical health and financial resources (Austin & Totaro, 2011, cited in Breslau et al., 2015; Patrão & Hubert, 2016; Reis et al., 2016; Stepien, 2014; Vally et al., 2020; Young, 2009).

In the specific case of the military, problematic Internet use and OAB are already considered detrimental to force readiness (Schmidt et al., 2019).

2.1.5. Prevention

Prevention includes a broad set of measures that aim to reduce the impact of an illness or disability and / or the speed at which it progresses (O'Connel, Boat & Warner, 2009, cited in Throuvala, Griffiths, Rennoldson & Kuss, 2019).

Despite the scarcity of published studies on the prevention of OAB (King et al., 2018; Saletti et al., 2021; Throuvala et. al., 2019; Vayre & Vonthron, 2019), to assess the most effective strategies and the effectiveness of the programmes developed so far (Saletti et al., 2021), most authors agree on the need for prevention and early intervention to reduce the harmful consequences of this problem (Lopez-Fernandez & Kuss, 2020; Saliceti, 2015; Turner et al., 2021) by encouraging moderation when using the internet, rather than terminating that use or reducing it to a minimum (King et al., 2018).

In a study on OAB in the military, Breslau et al. (2015) stressed the need to change the culture of the US Air Force regarding Internet use – from an exclusively disciplinary approach to abusive behaviours to one that takes mental health into account –, and proposed the implementation of a OAB prevention methodology that includes the measures in Figure 1.

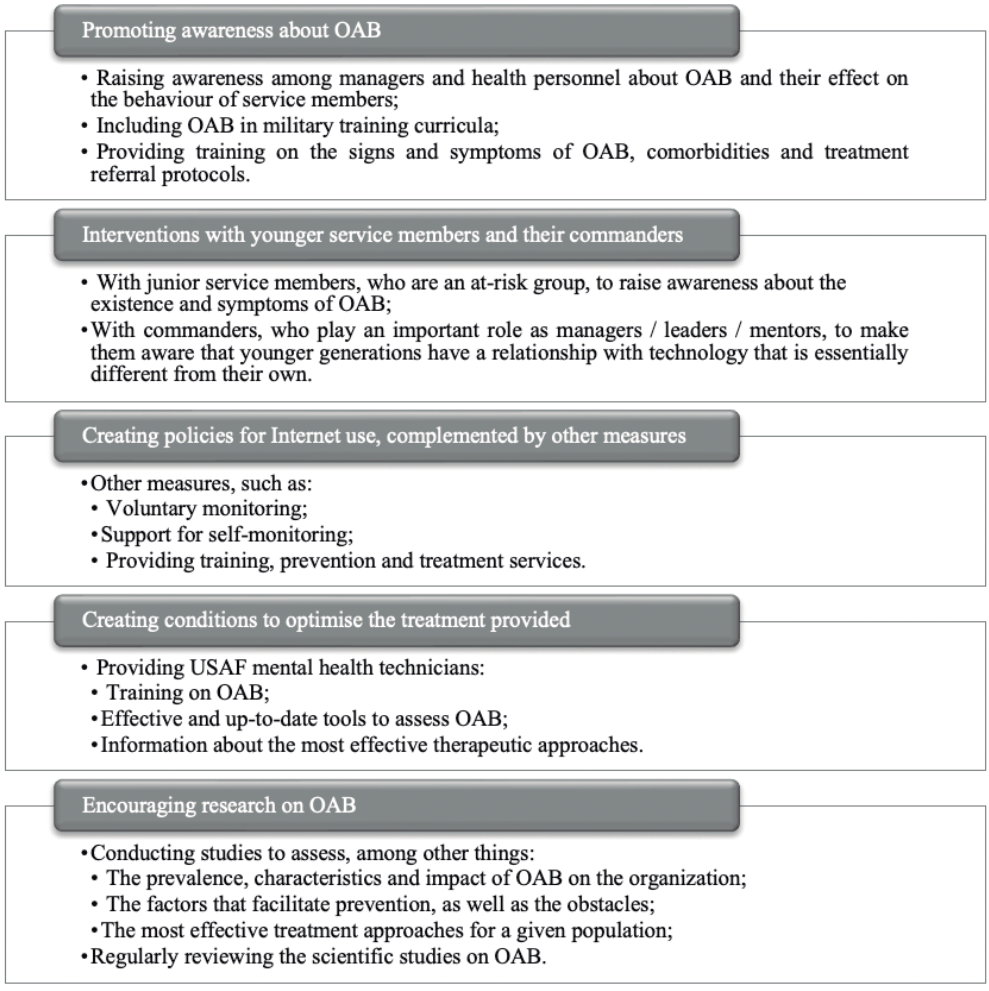

Figure 1 – Proposed measures to prevent OAB in the US Air Force
Source: Prepared from Breslau et al. (2015).

2.2. Analysis model

The study was organized according to the concept map in Table 1.

Table 1 – Concept map representing the model of analysis used in the study

General Objetive		To assess the possibility of extending the measures implemented in the Portuguese Air Force to prevent addictive behaviours to online addictive behaviours.		
Specific Objetives	**Research Question**	Should the measures implemented in the Portuguese Air Force to prevent addictive behaviours be extended to online addictive behaviours?		
	Subsidiary Questions	**Concept**	**Dimensions**	**Data collection**
SO1 To analyse the prevention of addictive behaviours in the Air Force	**SQ1** What measures has the PoAF implemented to prevent addictive behaviours?	Online addictive behaviours	Operationalisation	Document analysis, questionnaire survey, semi-structured interview
			Prevalence	
			Risk factores	
SO2 To analyse the prevalence of online addictive behaviours among Air Force personnel	**SQ2** Are online addictive behaviours prevalent among PoAF personnel?		Consequences	
			Prevention	

3. Methodology and method

This chapter describes the methodology and method used in the study.

3.1. Metohodology

This study uses inductive reasoning, a mixed research strategy (quantitative with qualitative elements) and a case study research design (Santos & Lima, 2019).

3.2. Method

3.2.1. Participants and procedures

Participants. In quantitative terms, the sample analysed in this study consisted of 766 service members[2] (Table 2), most of whom are male (71.54%), aged [41, 50] (29.63%), in the Officer category (58.36%), stationed in Units that do not fit the definition of Base Units (BU)[3] (60.97%), not enrolled in a career course (69.58%), and who do not usually reside in their Unit (65.54%).

[2] 12.97% of the population, according to data provided on 20 May 2022 by the Data Office of the PoAF Personnel Directorate.
[3] Defined as an "[...] aviation installation which can refer to an Air Base, Manoeuvres Airfield or Transit Airfield where one or more Air Units are, or may be, stationed" (RFA 305-1(B), 1999).

Table 2 – Sample characteristics

Sociodemographic variables		n
Gender	Male	548
	Female	218
Age group	<20	76
	21-30	198
	31-40	183
	41-50	227
	>50	82
Category	Officer	447
	Sargeant	278
	Other Ranks	41
Career course attendance	No	533
	Yes	233
Type of Stationing Unit	Base Unit	299
	Other Units	467
Residence in Stationing Unit	No	502
	Yes	246

The qualitative study sample consisted of eight interviewees (Table 3) who are stakeholders in the prevention of addictive behaviours in the AAFF and / or are actively involved in the prevention of OAB in the PoAF.

Table 3 – Interviewees

Organisation	Position	Name
National Defence Resources' General-Directorate (DGRDN)	DGRDN's representative for the PPCACDFA Steering Group	Dr. Nuno Caeiro
Drug Addiction and Alcoholism Intensive Treatment Unit (UTITA)	Chief of the Psychology and Counselling Sector	1LT Carolina Rodrigues
Navy – Organization Division	Responsible for the Military Security and Counterintelligence Area	CPT Hugo Guia
Army – Personnel Services Directorate	Chief of the Health and Addictions Prevention Sector	MAJ Ana Oliveira
Air Force – Communications and Information Systems Directorate (DCSI)	Chief of the IT Security and Ciberdefence Sub-Division	MAJ José Ferreira
Air Force – Health Directorate (DS)	Chief of the 1st Division	MAJ Marcos Cabral
Air Force – Social Action Service (SAS)	SAS's Chief	COL João Carvalho
Air Force – Military Security Coordination Office (GCSM)	GCSM's Chief	LT COL Paulo Vieira

Procedure.In the quantitative study, a questionnaire was pre-tested and delivered using Google Forms between 9 and 31 May 2022. In the qualitative study, the potential interviewees were contacted (in person or by phone) to inquire about their interest in participating in the study. If they agreed, the interviews were scheduled and the interviewees were informed of their rights regarding the anonymity and confidentiality of the answers, which all waived.

3.2.2. Data collection instrument(s)

Quantitative study. A questionnaire survey was prepared, organized into four sections:

– Sociodemographic data;

– Type of Internet use, analysed through 25 items that assessed: n=2 the global time of use and n=23 the access to specific content (online gaming and gambling, social networks, communication / chat applications, entertainment / media content and other uses);

– Internet addiction, scored using the Portuguese version of the Internet Addiction Test (IAT; Young, 1998; Pontes et al., 2014), comprising 20 items on a 6-point Likert scale ("0" = Not applicable and "5" = Always). The Internet addiction measure corresponds to the sum of the scores obtained, with higher scores indicating more severe levels of Internet addiction[4]. Specific adaptations were made to the wording of each item, as the survey was administered to a sample of adults.

– Functional changes due to problematic Internet use were measured using the Assessment Scale on Functional Changes due to Problematic Internet Use [*Escala de Alterações Funcionais pelo Uso Problemático de Internet*] (AFUPI; Patrão, Pimenta, Água & Leal, 2020; Pimenta, Patrão, Água & Leal, 2020), which included 9 items on 4-point Likert scale ("1" = Totally disagree and "4" = Totally agree), divided into behavioural (7 items) and emotional (2 items) dimensions.

Qualitative study. Seven semi-structured interview scripts were prepared. Some of the questions were "tailored" to the interviewees' area of expertise.

3.2.3. Data processing technique(s)

The quantitative analysis, which includes the descriptive statistics, was performed using the free trial version of the software Statistical Package for Social Sciences (SPSS 28.0). A methodology based on Guerra (2006, cited by Santos & Lima, 2009, p. 122) was used to perform the content analysis.

4. Data analysis and discussion of findings

This chapter will analyse the collected data and answer the research questions.

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[4] As advised by Young (2011a), scores in the [0-30] range are considered normal, [31-50] indicate mild addiction levels, [50-80] indicate moderate levels and [80-100] are considered severe.

4.1. Prevention of addictive behaviours in the Air Force

Before analysing OAB in the Armed Forces, this section will provide some information on the programme that regulates their prevention in the national AAFF – the PPCACDFA – and its implementation in the Navy and Army.

PPCACDFA. This Programme acts as a "[...] prophylactic and therapeutic network with different levels of intervention and specialisation". The programme has a set of goals that aim to promote abstinence from the consumption of psychoactive substances and ergogenic substances and moderation in alcohol consumption, and to prevent other addictive behaviours, such as high-risk and addictive gambling (Decision No. 11921/2015 of 23 October).

To achieve these goals, the PPCACDFA is targeted at military personnel, particularly at the students enrolled in the training courses for Officers, Sergeants and Other ranks or in military education institutions, and at civilian contractors and militarized personnel working for the AAFF (the latter, only through awareness / information actions) (N.F. Caeiro, email interview, 09 June 2022). The PPCACDFA also includes stakeholders responsible for coordination (PPCACDFA Steering Group [*Grupo Coordenador do* PPCACDFA] – GC/PPCACDFA), prevention and assessment / diagnosis, treatment and social reintegration of military personnel with addictive disorders (Drug Addiction and Alcoholism Intensive Treatment Unit [*Unidade de Tratamento Intensivo de Toxicodependência e Alcoolismo*] – UTITA), medical support (Armed Forces Hospital [Hospital das Forças Armadas] – HFAR), training prevention agents (PA) and health technicians (Military Health Education, Training and Research Unit [*Unidade de Ensino, Formação e Investigação em Saúde Militar*] – UEFISM). The Command Support Centres (*Núcleos de Apoio ao Comando* – NAC) are responsible for implementing preventive actions in their Units / Departments / Services (U/D/S) (C.M. Rodrigues, email interview, 24 June 2022; Decision No. 11921/2015, 23 October).

The PPCACDFA intervention is organized in 3 axes (MDN, 2019): military security, health promotion, and a cross-cutting axis that includes actions such as training, information campaigns and cooperation with external organizations. The health promotion axis is divided in three levels (Decision No. 11921/2015 of 23 October; MDN, 2019):

– Primary prevention. Information campaigns, awareness actions aimed at managers, medical screening, early identification and intervention programmes;

– Secondary prevention. Assessment / diagnosis, treatment and follow-up of service members with addictive or substance abuse disorders;

– Tertiary prevention. Relapse prevention and reintegration of service members.

According to C.M. Rodrigues (op. cit.) extending the PPCACDFA to addictive behaviours such as high-risk gambling will not be sufficient, given the scarcity of "measures to prevent new additive behaviours that do not involve substances or screens, [which can only carried out in] awareness sessions held by the UTITA/HFAR in the units of the three branches and [in] prevention sessions [...] held by the Prevention Agents [PA]".

For N.F. Caeiro (op. cit.), the measures to prevent OAB should be similar to those used for high-risk and addictive gambling, and should consist of:

> [...] awareness and information actions, such as holding lectures, producing leaflets and publishing information on various media platforms (institutional websites, *Rádio Lages*), [...] [including] time [reserved to address] these issues in the curricula of the courses offered by the Academies and Training Centres, as well as in the Course for Prevention Agents on Addictive Behaviours and Addictions ([*Curso de Operadores de Prevenção de Comportamentos Aditivos e Dependências*] – COPCAD) and respective refresher course, which [already include] a module on this issue, [but] which should address pathological gambling in more detail, [including] its online manifestations, as this is already a real concern for the AAFF.

Furthermore, for C.M. Rodrigues (op. cit.), the use of questionnaires to assess the

> [...] prevalence of Internet-related addictive behaviours [in order to plan] targeted initiatives [tailored to at-risk populations and units. Increasing the] psychological support provided in the units' health services. [Enhancing and updating the training of PA. Increasing the] number of lectures held in the units and awareness actions in which recovering service members share their stories.

When asked to assess the measures that are already implemented, C.M. Rodrigues (op. cit.) argued that they have proved effective, as

> [...] the military and civilian personnel of the AAFF have more information on the issue, and, on the other hand, managers [are] more aware of what constitutes addictive behaviour and addictions, and thus [are better able] to identify them, refer those afflicted to the proper channels and support the process of social and professional reintegration of service members who have received treatment at UTITA.

N.F. Caeiro (op. cit.) agreed that the

> [...] residual prevalence of this type of behaviour, reported both formally and informally, appears to indirectly validate the current preventive measures, [therefore, these measures] should remain the main strategy to address a behaviour that, so far, has had few consequences, if any, for the AAFF. [Furthermore, as this is an area that requires further research, the PPCACDFA Steering Group (GC/PPCACDFA) has decided to conduct] a study on the prevalence of additive behaviours that do not involve substances (gaming, gambling, screen use) and patterns of use of illicit substances (alcohol, tobacco, anabolic steroids, drugs), the results of which should reveal how the quality and effectiveness of the implemented measures can be adjusted and increased [...].

Implementation of the PPCACDFA and prevention of OAB in the Navy and Army. To prevent OAB, the Navy and the Army carry out education / information actions, as needed, under the framework of the programme. In addition to these actions, the Navy "[...] blocks access to websites with sexual content, gambling, RPGs (role playing games) and social networks [...]", which C.M. Rodrigues (op. cit.) believes is effective in deterring abusive or compulsive use of the Internet.

4.1.1. Implementation of the PPCACDFA in the Air Force

According to CEMFA Decision No. 61/2016 of 26 September, the programme's implementation is coordinated by the Air Force Personnel Commander (CPESFA). The Air Force Steering Group for Prevention of Additive Behaviours and Addictions ([*Núcleo Coordenador da Prevenção dos Comportamentos Aditivos e Combate às Dependências na Força Aérea*] – NCPCACDFA) includes representatives from the CPESFA, DS, SAS and GCSM.

In the U/S/D, the implementation is ensured by the "[...] Command Support Centre (NAC), which usually includes the Security Officer, the Head of the Social Action Office ([*Gabinete de Ação Social*] – GAS), the PA, the Head or representative of the Health Unit (US), the Chaplain and the Head of Physical Education" (Decision 61/2016 of 26 September).

With regard to the prevention measures that have been implemented, "[...] the Air Force's internal regulations [5] do not cover whole range of issues addressed in the PPCACDFA, and focus exclusively on alcohol and drug addiction" (P. J. Vieira, op. cit.), and, specifically, on toxicological screening for drugs and alcohol.

In addition to these regulations, the measures implemented in the PoAF include sniffer dog searches to detect substances (P. J. Vieira, op. cit.). With regards to health promotion, primary prevention activities include holding regular information sessions in all Units, such as lectures or awareness meetings with heads of "[...] critical services or departments [in addition to other actions] that are carried out as needed, according to the identified needs and available personnel [...]" (J. P. Carvalho, op. cit.), such as producing informative materials (flyers, posters, newsletters) or holding training events for GAS and NAC personnel and / or for PoAF personnel in general (M. T. Cabral, op cit.; J. P. Carvalho, op cit.). Regarding the information sessions, J.P. Carvalho (op. cit.) added that

> [...] the SAS has recommended that at least one session be held per year in each Unit. Although this recommendation is not included in the current regulations, it is usually complied with.

With regards to secondary prevention activities,

> [...] the US/NAC and the UTITA (or an equivalent unit) collaborate to refer and follow up cases, individual cases are monitored in the Units by the NAC (social action - GSM - US - Command and Management) [and] medical and social support is provided, as well as direct support from managers and other service members in the same service. (M. T. Cabral, op. cit.)

With regards to tertiary prevention, the PA collaborate "[...] in the social reintegration of service members who have entered a rehabilitation programme" (Decision No. 11921/2015 of 23 October, p. 30684). In terms of cross-cutting interventions, PoAF personnel must complete the COPCAD, the respective refresher course (CAOPCAD) and the Military Review Officer (MRO) (M. T. Cabral, op.cit; J. P. Carvalho, op. cit.).

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[5] CPESFA Determination No. 01/2005 of 19 August, CEMFA Decision No. 31/2009 of 29 June, and CPESFA Decision No. 31/2009 of 23 July.

4.1.2. OAB prevention in the Air Force

Despite not being specified in the current regulations, the measures that have been implemented to prevent OAB mainly aim to provide information, are carried out as needed, and consist of lectures, training events and a newsletter targeted at "[...] military and civilian personnel of the PoAF, in general or, occasionally, to the students of the training / instruction units" (J. P. Carvalho, op. cit.). However, the results of this approach cannot be evaluated because "[...] no system has been implemented to assess its effectiveness" (J. P. Carvalho, op. cit.).

Another preventive measure that affects all PoAF personnel is "blocking / filtering internet browsing to restrict access to websites with malicious or illegal content [...]" (P. J. Vieira, op. cit.). This is not covered by the PPCACDFA, but by specific legislation. One of the key documents on this issue is CEMFA Directive no. 12/2016 of 28 July, which establishes rules for the use of workstations with access to the internet, which are blocked from accessing "[...] any type of websites and services that, for any reason, are not [considered] suitable for common use" (annex p. 6), and prohibits access to "[...] websites with erotic or pornographic content, even if they are not illegal [...]" (Annex p. 8).

Furthermore, the DCSI has

> [...] autonomy to allow or disallow access to any website or URL. [For this reason, access to websites with content that includes] video games, online games, gambling websites and online casinos [is blocked, as well as access to social networks, with some exceptions, depending on whether they are used for work purposes]. Distance communication applications and collaborative tools [...] are not blocked [and service members can] access email services, Whatsapp and other tools of this type. [Access to entertainment and streaming content (e.g. Youtube, music, etc.) is only limited by the] bandwidth available [The criteria for blocking access to a type of content are] the technical requirements, such as the bandwidth available on the network or the processing load on equipment [and the] impact on productivity or service performance. (J. J. Ferreira, email interview, 09 June 2022)

Internet access through personal devices using the networks made available by the PoAF for leisure purposes is not subject to "[...] content restrictions or traffic blocking, [however, the] devices must be registered and monitored, as set out in the Directive [CEMFA Directive No. 19/2013 of 27 December]" (J. J. Ferreira, op. cit.).

J.P. Carvalho (op. cit.), M.T. Cabral (op. cit.) and P.J. Vieira (op. cit.) suggested the following measures to prevent OAB: increasing the education actions and the information provided; optimising the internal regulations on the prevention of addictive behaviours; expanding the leisure activities available in the Units; developing early detection and intervention programmes in the Health Units (US); and studying the prevalence of OAB.

4.1.3. Brief overview and answer to SQ1

Based on the above analysis, the answer to SQ1, *What measures has the PoAF implemented to prevent addictive behaviours?* is that they mainly focus on deterring the consumption of psychoactive substances through drug and alcohol screening (the only measure specified in

the regulations). Other measures that focus on education include providing information on a broader range of addictive behaviours. However, these measures are not properly systematised.

The problem of OAB requires further analysis, as shown by the decision of the GC/PPCACDFA to carry out a study to address it. Some (albeit insufficient) measures have already been implemented in the PoAF, which mainly focus on education and primary intervention. This type of OAB prevention approach is recommended by most studies (Vondráckova & Gabrhelik, 2016) as, according to some authors, it is effective in preventing Internet abuse in the workplace and promoting employee satisfaction (Young, 2011a). However, Saletti et al. (2021) warned that it can be ineffective when used in isolation, and recommend complementing it with other more interactive methodologies.

In the PoAF, this is done by blocking some types of content in workstations with Internet access, although the military personnel stationed in the PoAF Units can have unrestricted access to that content through the leisure network provided by the organization or through personal networks. Website blocking is not covered in the PPCACDFA, and websites are restricted based solely on technical and productivity requirements. It is still possible to access content which studies have flagged as susceptible to abusive / compulsive use, such as shopping or financial transactions websites (Vally et al., 2020). The analysed studies include content blocking as a measure to prevent Internet abuse in the workplace, although its application is complex, because the benefits of the restrictions must be weighed against the frustration that they cause on employees (Stanton & Weiss, 2000, cited in Breslau et al., 2015). Therefore, while it is considered an effective and cost-effective method that can encourage self-regulation of behaviour when it is self-imposed (Breslau et al., 2015), some authors argue against it being imposed by employers because it generates dissatisfaction and because "banned" content remains accessible through personal mobile equipment (Young, 2011b).

The last conclusion refers to the lack of data on the prevalence of OAB, which, together with the lack of a system to assess the effectiveness of the interventions, makes it impossible to objectively evaluate the real effects of these measures on preventing addictive behaviours, in general, and OAB, in particular, among PoAF personnel.

4.2. Analysis of the prevalence (or lack thereof) of online addictive behaviours among PoAF personnel

4.2.1. Psychometric properties of the scales

IAT. Two Exploratory Factor Analyses (EFA) with varimax rotation were performed. The number of factors was not limited in the first analysis, which revealed 2 factors (2F) that explained 58.5% of the total variance. In the second analysis (Table 1), the number of factors was limited to 1 (1F; according to the original solution), which explained 50.5% of total variance, with a Cronbach's alpha of 0.942, considered excellent by Hill and Hill (2002, p. 149)[6], validated by a KMO of 0.959 (considered excellent by Hill, & Hill, 2002, p. 275 and Kaiser, 1974,

[6] Cronbach's Alpha coefficient is considered acceptable from [0.7, 0.8[; good from [0.8, 0.9[; and excellent when ≥ 0.9 (Hill, & Hill, 2002, p. 149).

p. 35) and a Bartlett's Sphericity Test with a significant Chi-square (x^2=9729.242, p<0.0001). Based on the above data, and of the fact that this was the solution used in the Portuguese validation study (Pontes, et. al., 2014), the one-factor solution was used in this study.

Table 1 – Exploratory factor analysis (1F) and Cronbach's alpha coefficient in the IAT

Items	Factor loading
1. Do you stay online longer than you intendend?	.416
2. Do you leave the home chores undone in order to stay online longer?	.659
3. Do you prefer the Internet excitement to being intimate with your partner?	.657
4. Do you build new relationships online?	.546
5. Do people complain about the amount of time you spend online?	.672
6. Is your work or study undermined (e.g.: by postponing tasks, missing deadlines) by the amount of time you spend on the Internet?	.748
7. Do you check your email (or Facebook, Twitter, Instagram, etc.) account before carrying out any other tasks?	.609
8. Is your work or school performance undermined because of the Internet?	.776
9. Do you get defensive or keep secret when someone asks you what you are doing online?	.674
10. Do you block disturbing thoughts about your life with soothing thoughts about your Internet activities?	.687
11. Do you frequently wonder when you'll be online again?	.814
12. Are you afraid your life could be boring, empty or dull without the Internet?	.713
13. Do you get angry, annoyed or yell when someone disturbs you, when you are online?	.771
14. Do you lose sleep for being online until late at night?	.754
15. When you are offline, do you get worried of fantasize about being online?	.817
16. Do you tend to say "just a few more minutes" when you are online?	.733
17. Do you try to reduce the amount of time you spend online, unsuccessfully?	.735
18. Dou you try to hide the amount of time you spend online?	.777
19. Do you prefer to stay online longer, rather than go out with other people?	.723
20. Do you feel depressed, moody or nervous when you are offline, and stop feeling like that when you get back online?	.800
Cronbach's Alpha	.942

AFUPI. An EFA with varimax rotation was performed with unlimited factors, which reveal ed 2F (Table 2) that explained 73.1% of the total variance, with Cronbach's alphas of 0.682 and 0.934, considered questionable and excellent, respectively (Hill & Hill, 2002, p. 149; Kaiser, 1974, p. 35). This EFA was validated by a KMO of 0.916 (considered excellent by Hill & Hill, 2002, p. 275 and Kaiser, 1974, p. 35) and a Bartlett's Test of Sphericity which yielded a significant Chi-square (x^2 =4834.781, p<0.0001).

Table 2 – Exploratory factor analysis and Cronbach's alpha coefficient in the AFUPI

Factor	Items	Factor loading	
		1	2
Behavioural Dimension (α=0,934)	1. Being on the Internet takes me up time from school/work.	.782	
	2. Being on the Internet takes me time from sleeping.	.811	
	3. Being on the Internet takes me time from socializing with my friends/colleagues.	.878	
	4. Being on the Internet takes me time from dating.	.847	
	5. Being on the Internet takes me time from being with my family.	.885	
	6. Being on the Internet takes me time from exercise.	.837	
	7. Being on the Internet takes me time from other leisure activities.	.834	
Emotional Dimension (α=0,682)	8. I have a tendency to be on the Internet when I have emotional problems (e.g.: arguments, problems with friends, at school or with family and/or health concerns).		.650
	9. I consider myself to be dependent on my Internet activities.		.682

4.2.2. Descriptive and inductive analysis (Mean differences)

The IAT results classified according to the cut-off criteria that were defined (Table 3) show that most participants are "normal users" (n=557; 72.7%), and that 22.3% (n=171) have mild levels of addiction, 4.7% (n=36) have moderate levels and 0.3% (n=2) have severe levels.

Table 3 – Analysis of the sample's levels of Internet Addiction (IAT)

		"Normal users"		Mild addiction		Moderate addiction		Severe addiction	
		n	%	n	%	n	%	n	%
Gender	Male	389	71.0	125	**22.8**	32	**5.8**	2	**0.4**
	Female	168	77.1	46	21.1	4	1.8	0	0
Age	<20	42	55.3	23	30.3	11	**14.5**	0	0
	[21-30]	119	60.1	65	**32.8**	12	6.1	2	**1**
	[31-40]	136	74.3	42	23.0	5	2.7	0	0
	[41-50]	187	82.4	33	14.5	7	3.1	0	0
	>50	73	89.0	8	9.8	1	1.2	0	0
Category	Other Ranks	30	73.2	8	19.5	3	**7.3**	0	0
	Sergeant	228	82.0	42	15.1	6	2.2	2	**0.7**
	Officer	299	66.9	121	**27.1**	27	6.0	0	0
Career Course	No	428	80.3	90	16.9	15	2.8	0	0
	Yes	129	55.4	81	**34.8**	21	**9.0**	2	**0.9**
Unit	BU	215	71.9	62	20.7	20	**6.7**	2	**0.7**
	Others	342	73.2	109	**23.3**	16	3.4	0	0
Residence in Unit	No	397	79.1	93	18.5	12	2.4	0	0
	Yes	160	60.6	78	**29.5**	24	**9.1**	2	**0.8**

Furthermore, as shown in Table 3:

– Most service members with severe levels of addition are in the Sergeants category (n=2;0.7%), male (n=2;0.4%), aged 21 to 31 (n=2;1%), attending a career course (n=2;0.9%), stationed in BU (n=2;0.7%) and residing in their respective units (n=2;0.8);

– Most service members with moderate levels of addition are in the Other ranks category (n=3;7.3%), male (n=32;5.8%), under 20 years of age (n=11;14.5%), stationed in BU (n=20;6.7%), attending career courses (n=21;9.0%) and residing in their respective Units (n=24;9.1%);

– Most service members with mild levels of addition are Officers (n=121;27.1%), male (n=125;22.8%), aged 21 to 30 (n=65;32.8%), attending career courses (n=81;34.8%), stationed in "other Units" (n=109;23.3%) and residing in those Units (n=78;29.5%).

As shown in Table 4, the highest percentages of participants use the internet for 1 to 2 hours a day on weekdays (30.8%;n=236), 2 to 4 hours a day on rest days (30.4%;n=233), and the percentage of participants that use the Internet daily for more than 6 hours is higher on rest days (7.2%;n=55) than on weekdays (6.9%;n=53).

Table 4 – Time spent daily on online activities unrelated to work or study, on weekdays and rest days

Nr. of hours	Weekdays		Rest days	
	n	%	n	%
Never	8	1.0	6	0.8
≤ 1	193	25.2	150	19.6
]1,2]	236	30.8	229	29.9
]2,4]	193	25.2	233	30.4
]4,6]	83	10.8	93	12.1
>6	53	6.9	55	7.2

As Table 5 shows, most participants (97.3%;n=745) use the Internet for communication / chat, social networking (88.8%;n=680) and entertainment (88.5%;n=678).

Table 5 – Types of accessed online content

	Use		Not use	
	n	%	n	%
Games	288	37.6	478	62.4
Social networks	680	88.8	86	11.2
Communication/chat	745	97.3	21	2.7
Entertainment	678	88.5	88	11.5
Others	437	57.0	329	43

Specifically regarding online game activities, of the 37.6% who use the Internet for this purpose, 4% accessed gambling websites, 36.4% use other types of games, and 7.6% use both types (Table 6).

Table 6 – Types of online game activity

		Use		Not use	
		n	%	n	%
Types of online game activities	Gambling	31	4	257	33.6
	Other games	279	36.4	9	1.2
	Both	22	7.6	266	34.7

Table 7 shows that most participants (marked in bold) access these types of content using portable devices, from home, for up to 1 hour a day, both on weekdays and on rest days. The type of content that service members use the most in the workplace are communication / chat applications (21.5%).

Table 7 – Specific types of online content

		Game		Social Networks		Comunication/ chat		Entertainment	
		n	%	n	%	n	%	n	%
Type of devices	Portable	241	**83.7**	672	**98.8**	736	**98.8**	586	**86.4**
	Fixed	47	16.3	8	1.2	9	1.2	92	13.6
Contexts of use/access	Unit lodging	21	7.3	123	18.1	107	14.4	94	13.9
	Home	249	**86.5**	477	**70.1**	431	**57.9**	534	**69.7**
	School	0	0	2	0.3	4	0.5	0	0
	Public facilities	16	5.6	47	6.9	43	5.8	36	5.3
	Unit/work place	2	7.0	31	4.6	160	21.5	14	2.1
Daily time on weekdays (hours)	Never	34	11.8	5	0.7	0	0	24	3.5
	≤ 1	173	60.1	392	**57.6**	399	**53.6**	389	**57.4**
	]1,2]	53	18.4	195	28.7	206	27.7	179	26.4
	]2,4]	22	7.6	62	9.1	91	12.2	73	10.8
	]4,6]	4	1.4	20	2.9	33	4.4	8	1.2
	> 6	2	0.7	6	0.9	16	2.1	5	0.7
Daily time on rest days (hours)	Never	7	2.4	6	0.9	7	0.9	5	0.7
	≤ 1	128	**44.4**	325	**47.8**	394	**52.9**	290	**42.8**
	]1,2]	86	29.9	214	31.5	224	30.1	215	31.7
	]2,4]	44	15.3	97	14.3	74	9.9	128	18.9
	]4,6]	16	5.6	29	4.3	30	4.0	34	5.0
	>6	7	2.4	9	1.3	16	2.1	6	0.9

Table 8 shows that the most accessed type of content is information / news (47.2%;n=185), followed by web searches (35.5%;n=100).

Table 8 – Other types of online content accessed by participants

	Use		Not use	
	n	%	n	%
Shopping	61	15.6	331	84.4
Communication*	37	9.4	335	90.6
Sports	15	3.8	377	96.2
Study	58	14.8	334	85.2
Information/news	185	**47.2**	207	52.8
Reading	17	4.3	375	95.7
Research	100	**35.5**	292	74.5
Work	37	9.4	358	90.6
Financial transactions**	34	8.7	358	91.3
Utilities***	36	9.2	356	90.8
Sales	14	3.6	378	96.4
Miscellaneous****	13	3.3	379	96.7

Legend: *"Communication" – email and communication using online resources not mentioned in previous questions; **"Financial transactions" – stock transactions, cryptocurrency and banking websites / applications; ***"Utilities" – web searches for various content related to daily tasks (weather, GPS, cooking apps / websites, etc.); ****"Miscellaneous" – Various content accessed sporadically that does not fit into the remaining categories (sexual content, software search, hobbies, downloads, etc.).

Table 9 shows that there is a statistically significant difference between the mean scores obtained in the IAT with regards to gender (t=3.127, p<0.05), with men obtaining significantly higher scores.

Table 9 – Mean differences in IAT by gender, course, Unit and residing in a Unit

Variable	Group	n	M	SD	T -*Student Test*		Homocedasticity	
					t	*p*	Levene	*p*
Gender	M	548	**26.35**	13.159	**3.127**	.02	.003	n.s.
	F	218	**23.11**	12.320				
Career Course	Yes	233	29.17	15.547	-5.368	<.001	28.391	<.001
	No	533	23.79	11.349				
Unit	BU	299	15.10	5.941	-0.296	.767	.064	n.s.
	Others	467	14.97	5.864				
Residence in Unit	Yes	264	29,20	14.533	-5.952	<.001	10.906	.001
	No	502	23.44	11.652				

Note: To confirm the homoscedasticity requirement, the p value associated with the Levene test should be n.s. (≥.05)

In a similar analysis of the AFUPI scores (Table 10), a statistically significant difference was found in the mean total scores for attendance of career courses (t=-5.562, p<0.001). Statistically significant differences were also found in the mean scores of the Behavioural Dimension for attendance of career courses (t=-4.603, p<0.001) and residing in a Unit (t=-2.936, p<0.05).

Table 10 – Mean differences in the AFUPI scores by variables (gender, course, Unit and residing in a Unit)

Dimension	Factor	Group	n	M	DP	Teste *t-Student*		Homocedasticity	
							p	Levene	*p*
AFUPI	Gender	M	548	14.99	5.900	-.239	.811	.023	n.s.
		F	218	15.11	5.878				
	Career Course	Yes	**233**	16.78	5.770	**-5.562**	**<.001**	.044	**n.s.**
		No	**533**	14.26	5.782				
	Unit	BU	299	15.10	5.941	-.296	.767	.064	n.s.
		Others	467	14.97	5.864				
	Residence in Unit	Yes	264	29.20	14.533	-5.952	<.001	10.906	.001
		No	502	23.44	11.652				
Behavioural Dimension	Gender	M	548	11.85	5.001	-.418	.676	.335	n.s.
		F	218	12.02	5.161				
	Career Course	Yes	**233**	13.15	4.859	**-4.603**	**<.001**	1.081	**n.s.**
		No	**533**	11.35	5.030				
	Unit	BU	299	11.92	5.040	-.092	.927	.120	n.s.
		Others	467	11.89	5.052				
	Residence in Unit	Yes	**264**	12.64	4.776	**-2.936**	**.003**	2.535	**n.s.**
		No	**502**	11.52	5.142				
Emotional Dimension	Gender	M	548	3.14	1.443	.502	.616	4.411	n.s.
		F	218	3.08	1.271				
	Career Course	Yes	233	3.63	1.480	-6.798	<.001	16.976	<.001
		No	533	2.90	1.298				
	Unit	BU	299	3.18	1.468	-.918	.359	4.585	n.s.
		Others	467	3.09	1.348				
	Residence in Unit	Yes	264	3.50	1.477	-5.471	<.001	13.611	<.001
		No	502	2.93	1.310				

Note: To confirm the homoscedasticity requirement, the p value associated with the Levene test should be n.s. (≥.05)

The analysis of Table 11 and the respective Post Hoc tests revealed statistically significant differences in the total IAT scores of service members, when analysed according to:

– *Age* ($x^2(2)=42.770$, p<0.001), between ">50years"$_{(M=22.02;\ SD=9.302)}$ and "21-30years"$_{(M=28.15;\ SD=14.315)}$ (Post Hoc, p<0.001), ">50years" and "<20years"$_{(M=31.18;\ SD=15.290)}$(Post Hoc, p<0.001), "41-50years"$_{(M=23.17;\ SD=11.648)}$ and "21-30years" (Post Hoc, p<0.001),"41-50years" and "<20years" (Post Hoc, p<0.001), "31-40years"$_{(M=24.40;\ SD=12.279)}$ and "21-30years" (Post Hoc, p<0.05), "31-40years" and "<20years" (Post Hoc, p<0.05);

– *Category* ($x^2(2)=27.468$, p<0.001), between Sergeant$_{(M=22.68;\ SD=12.788)}$ and Officer(M=27.32; SD=12.692) (Post Hoc, p<0.001) and Other ranks$_{(M=23.39;\ SD=14.387)}$ and Officer (Post-Hoc, p<0.05).

Table 11 – Mean differences in the IAT scores by age and category

Variable	Group	n	M	DP	Min.	Máx.	*Kruskal-Wallis*		
								x^2	p
Age	<20	76	**31.18**	15.290	4	73			
	[21-30]	198	**28.15**	14.315	0	81			
	[31-40]	183	**24.40**	12.279	0	69	4	42.770	**<.001**
	[41-50]	227	**23.17**	11.684	0	70			
	>50	82	**22.02**	13.001	0	81			
Category	Other	41	**23.39**	14.387	0	60	2	27.468	**<.001**
	Sergeant	278	**22.68**	12.788	0	81			
	Officer	447	**27.32**	12.692	0	73			

Note: As the "n" of the age and category groups was not well distributed, a non-parametric test was used (Kent State University, 2022a – Kruskal-Wallis).

A similar analysis was performed for the AFUPI (Table 12), which revealed statistically significant differences between the total scores and the variables:

– *Age* ($x^2(2)=50.969$, $p<0.001$), between ">50years"(M=12.72; SD=5.068) and "31-40years"$_{(M=15.09;\ SD=5.807)}$ (Post Hoc, $p<0.05$), ">50years" and "21-30years"$_{(M=15.79;\ SD=5.397)}$(Post Hoc, $p<0.001$), ">50years" and "<20years"$_{(M=17.72;\ SD=5.901)}$ (Post Hoc, $p<0.001$), "41-50years"$_{(M=14.23;\ SD=6.214)}$ and "21-30years" (Post Hoc, $p<0.001$), "41-50years" and"<20years" (Post Hoc, $p<0.001$), "31-40years" and "<20years" (Post Hoc, $p<0.05$);

– *Category* ($x^2(2)=21.326$, $p<0.001$), between Sergeant and Officer;

The analysis of Table 12 and the respective Post Hoc tests also revealed significant differences between the Behavioural Dimension of the AFUPI and the following variables:

– *Age* ($x^2(2)=41.632$, $p<0.001$), between ">50years"$_{(M=10.13;\ SD=4.537)}$ and "31-40years"$_{(M=11.99;\ SD=4.946)}$ (Post Hoc, $p<0.05$), ">50years" and "21-30years"$_{(M=12.33;\ SD=4.476)}$(Post Hoc, $p<0.001$), ">50years" and "<20years"$_{(M=13.97\ SD=5.120)}$ (Post Hoc, $p<0.001$), "41-50years"$_{(M=11.41;\ SD=5.467)}$ and "21-30years" (Post Hoc, $p<0.05$), "41-50years" and "<20years"(Post Hoc, $p<0.001$) and "31-40years" and "<20years" (Post Hoc, $p<0.05$);

– *Category* ($x^2(2)=19.894$, $p<0.001$), between Sergeant$_{(M=11.08;\ SD=5.046)}$ and Officer$_{(M=12.49;\ SD=5.062)}$ (Post-Hoc, $p<0.001$).

The analysis of the data on the Emotional Dimension (Table 12) and associated Post Hoc tests showed significant mean differences in:

– *Age* ($x^2(2)=57.281$, $p<0.001$), ">50years$_{(M=2.59;\ SD=1.006)}$ and "31-40years"$_{(M=3.10;\ SD=1.401)}$ (Post Hoc, $p<0.05$), ">50years" and "21-30years"$_{(M=3.46;\ SD=1.466)}$ (Post Hoc, $p<0.001$), ">50years" and "<20years"$_{(M=3.75;\ SD=1.453)}$ (Post Hoc, $p<0.001$), "41-50years"$_{(M=2.82;\ SD=1.285)}$ and "21-30years" (Post Hoc, $p<0.001$), "41-50years" and "<20years"(Post Hoc, $p<0.001$) and "31-40years" and "<20years" (Post Hoc, $p<0.05$);

– *Category* ($x^2(2)=12.550$, $p<0.05$), between Sergeant$_{(M=2.92;\ SD=1.356)}$ and Officer$_{(M=3.24;\ SD=1.398)}$ (Post Hoc, $p<0.001$).

Table 12 – Mean differences in the AFUPI scores by age and category

	Variable	Group	n	M	DP	Min.	Máx.	*Kruskal-Wallis*		
								g.l.	x^2	p
AFUPI Total	Age	<20	76	**17.72**	5.901	9	31	4	50.969	**<.001**
		[21-30]	198	**15.79**	5.397	9	36			
		[31-40]	183	**15.09**	5.807	9	33			
		[41-50]	227	**14.23**	6.214	9	32			
		>50	82	**12.72**	5.068	9	29			
	Category	Other	41	**14.27**	4.960	9	27	2	21.326	**<.001**
		Sergeant	278	**14.01**	5.904	9	33			
		Officer	447	**15.73**	5.871	9	36			
Behavioural Dimension	Age	<20	76	**13.97**	5.120	7	28	4	41.632	**<.001**
		[21-30]	198	**12.33**	4.476	7	28			
		[31-40]	183	**11.99**	4.946	7	27			
		[41-50]	227	**11.41**	5.467	7	28			
		>50	82	**10.13**	4.537	7	27			
	Category	Other	41	**11.07**	3.914	7	21	2	19.894	**<.001**
		Sergeant	278	**11.08**	5.046	7	28			
		Officer	447	**12.49**	5.062	7	28			
Emotional Dimension	Age	<20	76	**3.75**	1.453	2	6	4	57.281	**<.001**
		[21-30]	198	**3.46**	1.466	2	8			
		[31-40]	183	**3.10**	1.401	2	7			
		[41-50]	227	**2.82**	1.285	2	8			
		>50	82	**2.59**	1.006	2	6			
	Category	Other	41	**3.20**	1.520	2	7	2	12.550	**.002**
		Sergeant	278	**2.92**	1.356	2	8			
		Officer	447	**3.24**	1.398	2	8			

Note: As the "n" of the age and category groups was not well distributed, a non-parametric test was used (Kent State University, 2022a – Kruskal-Wallis).

The analysis of Table 13, complemented by the results of the Post Hoc tests, revealed statistically significant differences between the mean IAT scores when analysed by time spent on the Internet daily:

– *Weekdays* ($x^2(2)=45.648$, $p<0.001$), between "≤1hour"$_{(M=21.39;\ SD=10.391)}$ and"1-2hours"$_{(M=24.77;\ SD=12.233)}$ (Post Hoc, $p<0.05$), "≤1hour" and "2-4hours"$_{(M=27.04;\ SD=12.156)}$ (Post Hoc, $p<0.001$), "≤1hour" and "4-6hours"$_{(M=29.02;\ SD=16.131)}$ (Post Hoc, $p<0.001$) and"≤1hour" and ">6hours"$_{(M=31.85;\ SD=17.336)}$ (Post Hoc, $p>0.001$);

– *Rest days* ($x^2(2)=85.853$, $p<0.001$), between "≤1hour"$_{(M=19.06;\ SD=10.608)}$ and "1-2hours"$_{(M=24.19;\ SD=11.505)}$ (Post Hoc, $p<0.001$), between "≤1hour" and "2-4hours"$_{(M=27.24;\ SD=12.192)}$ (Post Hoc, $p<0.001$), "≤1hour" and "4-6hours"$_{(M=30.27;\ SD=15.157)}$ (Post Hoc, $p<0.001$), "≤1hour" and ">6hours"(M=32.65; SD=16.156) (Post Hoc, $p<0.001$), "1-2hours" and "4-6hours" (Post Hoc, $p<0.001$), "1-2hours" and ">6hours" (Post Hoc, $p<0.001$).

Table 13 – Mean differences in the IAT scores by time spent on the Internet daily

Variable	Group	n	M	DP	Min.	Máx.	*Kruskal-Wallis*		
							g.l.	x^2	p
Weekdays	Never	8	**23.25**	12.056	3	47	5	45.648	**<.001**
	≤ 1 hr	193	**21.39**	10.391	0	60			
	]1-2] hr	236	**24.77**	12.233	0	69			
	]2-4] hr	193	**27.04**	12.156	1	81			
	]4-6] hr	83	**29.02**	16.131	0	80			
	>6 hr	53	**31.85**	17.336	0	72			
Rest days	Never	6	**20.00**	6.419	7	23	5	85.853	**<.001**
	≤ 1 hr	150	**19.06**	10.608	0	60			
	]1-2] hr	229	**24.19**	11.505	0	81			
	]2-4] hr	233	**27.24**	12.192	2	62			
	]4-6] hr	93	**30.27**	15.157	0	80			
	>6 hr	55	**32.62**	16.156	0	68			

Note: As the "n" of the groups regarding the time spent online daily on weekdays and rest days was not well distributed, a non-parametric test was used (Kent State University, 2022a – Kruskal-Wallis).

The analysis of Table 14 and respective Post Hoc tests revealed statistically significant differences between the total scores of the AFUPI according to time spent on the Internet daily:

– *Weekdays* ($x^2(2)=24.223$, $p<0.001$), between "≤1hour" $_{(M=13.82;\ SD=5.745)}$ and "2-4hours"(M=15.36; SD=5.683) (Post Hoc, $p<0.05$), "≤1hour" and "4-6hours" $_{(M=16.60;\ SD=6.184)}$ (Post Hoc, $p<0.05$) and "≤1hour" and ">6hours" $_{(M=16.79;\ SD=6.655)}$ (Post Hoc, $p<0.05$);

– *Rest days* ($x^2(2)=34.258$, $p<0.001$), between "≤1hour" $_{(M=13.43;\ SD=5.699)}$ and "2-4hours" $_{(M=15.82;\ SD=5.835)}$ (Post Hoc, $p<0.001$), "≤1hour" and "4-6hours" $_{(M=15.78;\ SD=5.801)}$ (Post Hoc, $p<0.05$) and "≤1hour" and ">6hours" $_{(M=16.84;\ SD=6.423)}$ (Post Hoc, $p<0.001$).

Table 14 – Mean differences in the AFUPI scores by time spent on the Internet daily

	Variable	Group	n	M	DP	Min.	Máx.	*Kruskal-Wallis*		
								g.l.	x^2	p
AFUPI Total	Weekdays	Never	8	17.25	6.756	9	29	24.223	<.001	**<0,001**
		≤ 1 hr	193	**13.82**	5.745	9	33			
		]1-2] hr	236	14.71	5.654	9	31			
		]2-4] hr	193	**15.36**	5.683	9	36			
		]4-6] hr	83	**16.60**	6.184	9	30			
		>6 hr	53	**16.79**	6.655	9	30			
	Rest days	Never	6	10.83	2.639	9	16	34.258	<.001	**<0,001**
		≤ 1 hr	150	**13.43**	5.699	9	33			
		]1-2] hr	229	14.62	5.751	9	32			
		]2-4] hr	233	**15.82**	5.835	9	36			
		]4-6] hr	93	**15.78**	5.801	9	30			
		>6 hr	55	**16.84**	6.423	9	30			
Behavioural Dimension	Weekdays	Never	8	14.50	6.590	7	27	20.970	<.001	**<0,001**
		≤ 1 hr	193	**10.96**	5.058	7	28			
		]1-2] hr	236	11.75	4.941	7	28			
		]2-4] hr	193	**12.06**	4.733	7	28			
		]4-6] hr	83	**13.05**	5.118	7	27			
		>6 hr	53	**13.25**	5.585	7	24			
	Rest days	Never	6	8.67	2.251	7	13	26.893	<.001	**<0,001**
		≤ 1 hr	150	**10.79**	5.252	7	28			
		]1-2] hr	229	11.65	5.018	7	28			
		]2-4] hr	233	**12.53**	4.956	7	28			
		]4-6] hr	93	**12.35**	4.743	7	25			
		>6 hr	55	**12.93**	5.069	7	23			
Emotional Dimension	Weekdays	Never	8	2.75	1.035	2	5	21.218	<.001	**<0,001**
		≤ 1 hr	193	**2.85**	1.220	2	8			
		]1-2] hr	236	2.97	1.268	2	7			
		]2-4] hr	193	**3.30**	1.465	2	8			
		]4-6] hr	83	**3.55**	1.610	2	8			
		>6 hr	53	3.55	1.659	2	8			
	Rest days	Never	6	2.17	0.408	2	3	42.305	<.001	**<0,001**
		≤ 1 hr	150	**2.64**	0.999	2	6			
		]1-2] hr	229	**2.97**	1.274	2	7			
		]2-4] hr	233	**3.30**	1.442	2	8			
		]4-6] hr	93	**3.43**	1.570	2	7			
		>6 hr	55	**3.91**	1.756	2	8			

Note: As the "n" of the age and category groups was not well distributed, a non-parametric test was used (Kent State University, 2022a – Kruskal-Wallis).

Table 14 and the respective Post Hoc tests also revealed significant differences between the scores of the AFUPI Behavioural Dimension when analysed according to time spent on the Internet daily:

– *Weekdays* ($x^2(2)=20.970$, $p<0.001$), between "≤1hour" $_{(M=10.96;\ SD=5.058)}$ and "2-4hours" $_{(M=12.06;\ SD=4.733)}$ (Post Hoc, $p<0.05$), "≤1hour" and "4-6hours" $_{(M=13.05;\ SD=5.118)}$ (PostHoc, $p<0.05$) and "≤1hour" and ">6hours" $_{(M=13.25;\ SD=5.585)}$ (Post Hoc, $p<0.05$);

– *Rest days* ($x^2(2)=26.893$, $p<0.001$), between "≤1hour" $_{(M=10.79;\ SD=5.252)}$ and "2-4hours" $_{(M=12.53;\ SD=4.956)}$ (Post Hoc, $p<0.001$), "≤1hour" and "4-6hours" $_{(M=13.35;\ SD=4.743)}$ (PostHoc, $p<0.05$) and "≤1hour" and ">6hours" $_{(M=12.93;\ SD=5.069)}$ (Post Hoc, $p<0.05$);

The analysis of Table 14 also revealed statistically significant differences between the scores of the Emotional Dimension of the AFUPI when analysed according to time spent on the Internet daily:

– *Weekdays* ($x^2(2)=21.218$, $p<0.001$), between "≤1hour" $_{(M=2.85;\ SD=1.220)}$ and "2-4hours" $_{(M=3.30;\ SD=1.465)}$ (Post Hoc, $p<0.05$) and "≤1hour" and "4-6hours" $_{(M=3.55;\ SD=1.659)}$ (PostHoc, $p<0.05$);

– *Rest days* ($x^2(2)=42.305$, $p<0.001$), between "≤1hour" $_{(M=2.64;\ SD=0.999)}$ and "2-4hours" $_{(M=3.30;\ SD=1.442)}$ (Post Hoc, $p<0.001$), "≤1hour" and "4-6hours" $_{(M=3.43;\ SD=1.570)}$ (Post Hoc, $p<0.001$), "≤1hour" and ">6hours" $_{(M=3.91;\ SD=1.756)}$ (Post Hoc, $p<0.001$) and "1-2hours" $_{(M=2.97;\ SD=1.274)}$ and ">6hours" (Post Hoc, $p<0.05$).

Table 15 shows significant mean differences in the IAT scores for the use of

– *Social Networks*, between service members who use social networks $_{(M=25.74;\ SD=13.12)}$ and those who do not use social networks $_{(M=22.91;\ SD=11.778)}$ ($U=24739.0$; $p<0.05$);

– *Entertainment*, between service members who access entertainment content $_{(M=25.69;\ SD=12.866)}$ and those who do not access entertainment content $_{(M=23.42;\ SD=13.907)}$ ($U=25849.0$; $p<0.05$).

Table 15 – Mean differences in the IAT scores by type of accessed content (social networks, communication / chat, entertainment)

Variable	Group	n	M	DP	*Mann-Whitney*		
					Z	*U*	*p*
Social networks	Yes	680	**25.74**	13.121	-2.330	24739.0	**.020**
	No	86	**22.91**	11.778			
Com./Chat	Yes	745	25.41	13.008	-.362	7461.0	.718
	No	21	25.90	13.034			
Entertainment	Yes	678	**25.69**	12.866	-2.041	25849.0	**.041**
	No	88	**23.42**	13.907			

Note: As the "n" of the groups was not well distributed regarding the use of social networks, communication / chat applications and entertainment content, a non-parametric test was used (Kent State University, 2022b – Mann-Whitney).

The analysis of Table 16 revealed a statistically significant difference between the mean IAT scores for the variable using (or not using) the Internet for gaming or gambling purposes ($t=-3.988$, $p<0.001$).

Table 16 – Mean differences in the IAT scores by type of accessed content (Game activity and Other content)

Variable	Group	n	M	DP	Teste *t-Student*		Homocedasticidade	
						p	Levene	*p*
Game activity	Yes	288	**27.82**	13.170	**-3.988**	<.001	.173	n.s.
	No	478	**23.99**	12.695				
Others	Yes	437	25.35	11.970	.174	.862	5.294	n.s.
	No	329	25.52	14.273				

Note: To confirm the homoscedasticity requirement, the p value associated with the Levene test should be n.s. (≥0.05)

The analysis of Table 17 revealed a significant difference in the mean scores of the Emotional Dimension of the AFUPI between service members who use online games (M=3.35; SD=1.474) and those who do not (M=2.99; SD=1.330).

Table 17 – Mean differences in the AFUPI scores by type of accessed content (Game activity and Other content)

Dimension	Variable	Group	n	M	DP	Teste *t-Student*		Homocedasticity	
							p	Levene	*p*
AFUPI Total	Game activity	Yes	288	15.56	5.497	1.939	.053	5.669	n.s.
		No	478	14.71	6.099				
	Others	Yes	437	15.13	6.083	-.584	.559	2.625	n.s.
		No	329	14.88	5.630				
Behavioural Dimension	Game activity	Yes	288	12.21	4.617	1.305	.192	6.707	n.s.
		No	478	11.72	5.281				
	Others	Yes	437	12.02	5.213	.720	.472	2.216	n.s.
		No	329	11.75	4.815				
Emotional Dimension	Game activity	**Yes**	288	3.35	1.474	**3.480**	<.001	9.752	n.s.
		No	478	2.99	1.330				
	Others	Yes	437	3.12	1.379	0.137	.891	.000	n.s.
		No	329	3.13	1.410				

Note: To confirm the homoscedasticity requirement, the p value associated with the Levene test should be n.s. (≥.05)

4.2.3. Brief overview and answer to SQ2

The above analysis provided an answer to SQ2, *Are online addictive behaviours prevalent among PoAF personnel?* While most of the sample report normal patterns of Internet use, a residual percentage show signs of severe addiction, and a significant portion of participants show signs of mild and moderate addiction which can be potentially damaging or limiting. The rates of severe addiction in PoAF personnel are lower than the 6% reported in the US Air Force (Miller et al., 2014), and similar to those found in a study conducted by the Greek

army (Giotakos et al, 2017), as well as to the results of various surveys of the Portuguese adult population (Água et al., 2018; Ribeiro, 2022).

The risk factors for the development of severe forms of addiction include being male, in the Sergeants category, between 21 and 30 years of age, attending a career course, stationed in a BU and residing in that Unit.

These findings confirm some of the risk factors for the development of OAB identified in previous studies, such as being male (Naskar, et. al, 2016; Patrão, 2016; Pontes et al., 2014; Ribeiro, 2022; Tao et al, 2010), belonging to younger age groups (Milleret al., 2014; Naskar et al., 2016; Pontes et al., 2014; Ribeiro, 2022; Young, 2011a) and being a student (Chak & Leung, 2004, cited in Baturay & Toker, 2019; Kendell, 1998, cited in Huang et al., 2009). Furthermore, the variables being male and being stationed in a BU had previously been identified in the PoAF as risk factors for tobacco consumption, and, in the case of being stationed in a BU, for the presence of levels of perceived stress which are considered pathological (Freixo, 2014).

The most accessed types of online content are communication / chat websites / applications (the latter is the most commonly accessed content in the workplace), social networks and entertainment. Game activities, despite being carried out by a lower percentage of service members, are associated with higher mean scores in the IAT and higher scores in the Emotional Dimension of the AFUPI. This may indicate that these contents are being used to alleviate negative emotions, which is a feature of the behaviour patterns associated with OAB (Tao et al., 2010; Wölfling et al., 2014) and suggests that the use of this type of content is a risk behaviour.

Finally, all types of online content included in the analysis are usually accessed through portable devices and from the homes of service members, which:

– Makes it difficult to identify problematic patterns of use in the PoAF, as they occur in private and using portable (and most likely personal) devices;

– May indicate a propensity for OAB associated with smartphone misuse, as suggested by Água (2017), Alkhateeb, Alboali, Alharabi and Saleh (2020) and Lee, Ahn, Choi and Choi (2014).

4.3. Assessment of the possibility of extending the measures implemented in the PoAF to prevent addictive behaviours to online addictive behaviours, and answer to the RQ

Based on the above analysis, the answer to the RQ, *Should the measures implemented in the Portuguese Air Force to prevent addictive behaviours be extended to online addictive behaviours?* is that this should be done, among other reasons, to prevent the OAB (which are mainly mild to moderate in terms of severity) identified in the 27.3% of the sample from progressing, and thus avoid having to implement measures to treat the problem.

The sooner this happens, the less likely the identified OAB are to worsen. Therefore, based on the data analysed and discussed above, the preventive intervention model proposed in Figure 2 should be implemented. The proposed model consists of OAB prevention measures based on five key focuses and corresponding actions / operationalisations.

Target population

PoAF service members who are:

- Students;
- Stationed in Base Units;
- Residing in their respective Units;
- From younger age groups.

Stakeholders

- NCPCACDFA;
- Unit commands;
- US, GAS and Unit NACs;
- Unit Clubs;
- DCSI and Unit IT centres;
- Air Force Recruitment Centre.

Measures/Actions to be

- Updating, reviewing and / or developing the regulations that implement the application of the PPCACDFA in the PoAF to create an institutional policy on OAB and addictive behaviours, in general, from a healthcare approach, in addition to the military security approach that already exists;
- Enhancing the educational approach by holding information sessions and publishing information in different media platforms, which should begin during the recruitment process;
- Improving the leisure activities available in the Units that do not involve the use of the Internet or other potentially addictive behaviours;
- Helping service members develop self-regulation mechanisms for Internet use, such as offering / distributing software / applications for monitoring the time they spend online (if necessary, with the support of the Unit IT Centres);
- Providing training on OAB to health staff and the NAC;
- Implementing a mechanism for quick intervention and early diagnosis of OAB during service members' annual medical assessments;
- Conducting more studies on this issue to obtain updated data that can be used, when necessary, to (re)adjust the measures to the characteristics of PoAF personnel.

Areas covered

Without disregarding other areas, the implemented measures / actions should address the following:

- Moderating access to online content, such as gaming / online gambling, social networking and entertainment content;
- Stressing the importance of reducing the time spent online;
- Acquiring/ developing skills to protect against OAB (self-regulation strategies for Internet use, stress management techniques, etc.);
- Stressing the importance of leisure activities that do not involve the internet.

Effectiveness assessment

Performing an annual assessment of the prevalence of OAB in the PoAF to evaluate the effectiveness of the implemented measures;
Analysing (anonymously and respecting the principles of ethics, deontology and medical confidentiality) the diagnostic data collected in the annual medical assessments to determine how the situation is progressing, both individually and globally.

Figure 2 – Proposed OAB prevention model for the PoAF

5. Conclusions

Man's relationship with technology has become progressively closer, and, today, several important aspects of social life do not require human intervention. An example of this is the importance of the Internet, which began as just another tool to be used in specific situations and is now essential in areas as diverse as healthcare, education and socialisation.

Despite its many advantages, a less benign aspect is that, for some people, it can also lead to harmful patterns of use of online resources that negatively affect their individual, family and social life, similar to those found in other addictive behaviours, both related and unrelated to substance use, with equally damaging consequences. Therefore, it is not surprising that mental health problems related to harmful use of the Internet (referred to in this study as addictive online behaviours) have increased in recent years, and are now considered a public health issue by the WHO.

The PoAF and its personnel are integrated in a society facing this issue, and as such are aware of it, especially because military personnel must maintain optimum levels of physical and mental health to successfully perform their missions.

This study analysed the prevention of OAB using inductive reasoning, a mixed strategy (quantitative with qualitative elements) and a case study design with the following delimitations: temporally, the study addresses the present day (June 2022); geographically, it analyses the PoAF; and, in terms of content, it focuses on the prevention of OAB in the PoAF.

To achieve SO1, *To analyse the prevention of addictive behaviours in the Air Force*, and answer the corresponding SQ, data were gathered through a literature review and content analysis of semi-structured interviews with stakeholders involved in the prevention of addictive behaviours in the military. The collected data showed that, in the PoAF, the measures to prevent addictive behaviours mainly focus on preventing the consumption of psychoactive substances through drug and alcohol screening, although other addictions (including OAB) are also addressed in information sessions in the Units (which are not properly systematised or regulated). The PoAF has implemented some measures to prevent OAB. However, their application is not specifically covered in the regulations for the implementation of the PPCACDFA. The preventive approach used in the PoAF is essentially educational, complemented by restrictions on Internet access, such as blocking the contents that can be accessed through the workstations.

To achieve SO2, *To analyse the prevalence of online addictive behaviours in Portuguese Air Force personnel*, and answer the corresponding SQ, a self-reporting questionnaire was delivered to 766 service members (12.97% of the population). A quantitative analysis of the collected data revealed that the percentage of service memebrs with severe levels of addiction to the Internet is residual (0.3%), although 27% have mild or moderate levels of addiction, which means that some PoAF personnel already show patterns of Internet use that can have some impact on the Organization. The following risk factors for the development of OAB in PoAF personnel were also identified: being male, from younger age groups, stationed in a BU, attending career courses and residing in their Unit. Furthermore, the use of Internet for gaming/gambling purposes was considered a potential risk factor for developing Internet

addiction. Finally, the online behaviours of the service members that participated in the study are characterised by the use of communication / chat applications / websites, social networks and entertainment content, mainly at home and using portable devices.

The study's GO*, To assess the possibility of extending the measures implemented in the Air Force to prevent addictive behaviours to OAB*, was achieved and the respective RQ answered. The findings revealed that this is not only appropriate but desirable, and, ideally, should be carried out as soon as possible to prevent the mild and moderate levels of Internet addiction identified in the sample from progressing. This extension should be based on five key focuses: *objectives, target population, stakeholders, measures / actions, areas covered, and effectiveness assessment*.

This study's main **contribution to knowledge** is the fact that the PoAF is now aware, inasmuch as it was possible to ascertain, of a possible approach: to the prevalence of OAB in a sample of its service members; to the risk factors associated with those behaviours; and to some variables that characterise the way they use the Internet.

Two ***limitations*** were identified, which are unrelated to the study and which did not affect the robustness of the findings. The first refers to the use of a convenience sample, which means that the results cannot be generalised to the universe under analysis. However, this limitation is minimised by the representativeness of the sample compared to the total number of PoAF personnel. The second refers to the use of a self-reporting questionnaire, which may be skewed by biases such as the social desirability effect. However, while this may have occurred, the collected data are in line with those found in the literature. Therefore, this effect is unlikely to have affected the quality of the findings.

Future studies are needed to monitor the impact of OAB on service members / the PoAF, especially after the model proposed here is implemented.

The study's **practical recommendation** is that the NCPCACDFA implement the proposed prevention model in the PoAF, and that the GC/PPCACDFA use the data collected in this study to develop further studies on the prevalence of OAB and to analyse the possibility of implementing the prevention model (or some of its measures) proposed here in the national AAFF.

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CLIMA ORGANIZACIONAL E CULTURA ORGANIZACIONAL NA ACADEMIA DA FORÇA AÉREA[1]

ORGANIZATIONAL CLIMATE AND ORGANIZATIONAL CULTURE IN THE AIR FORCE ACADEMY

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Resumo

Analisar variáveis de interesse para os decisores organizacionais, como sejam o clima e a cultura, traduz-se em maior capacidade de compreensão e otimização de situações que impactam sobre os resultados organizacionais. Esta investigação teve, então, por objetivo estudar o clima e cultura organizacionais dos alunos do Curso em Ciências Militares

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[1] Artigo adaptado a partir da dissertação de mestrado realizada no âmbito do Curso de Mestrado em Aeronáutica Militar, cuja defesa ocorreu em julho de 2022, na Academia da Força Aérea. A versão integral encontra-se disponível nos Repositórios Científicos de Acesso Aberto de Portugal (RCCAP).

Aeronáuticas (CCMA)[2] e do Estágio Técnico Militar (ETM) ministrados pela Academia da Força Aérea (AFA), por forma a averiguar a existência de diferenças e a identificar "tipologias" dominantes. Para tal, foi analisada uma amostra de 244 alunos (90% da população), com recurso aos instrumentos *Organizational Climate Measure* (OCM) e *Organizational Culture Assessment Instrument* (OCAI). Dos resultados obtidos, concluiu-se que existem diferenças significativas entre o CCMA e o ETM nos modelos de relações humanas e de cultura hierárquica, e entre o 1.º ano e os restantes anos do CCMA em praticamente todos os modelos estudados (excetuando o dos processos internos). Concluiu-se, igualmente, que, à parte do 1.º ano, apenas não existem diferenças em relação aos modelos de processos internos e cultura de mercado. As evidências encontradas permitiram, ainda, constatar que o clima e a cultura dominantes caracterizam-se pelos modelos de processos internos (cultura hierárquica) e objetivos racionais (cultura de mercado).

Palavras-chave: Clima Organizacional; Cultura Organizacional; Modelo dos Valores Contrastantes.

Abstract

Studying variables of interest for decision-makers in organizations, such as climate and culture, increases their ability to understand and optimise situations that influence organizational outcomes. Therefore, this study aimed to analyse the organizational climate and culture to which the students of the Military Aeronautical Sciences Course (CCMA)[3] and of the Military Technical Training Programme (ETM) of the Air Force Academy (AFA) are exposed, to identify differences between them and identify dominant "typologies". To that end, a survey sample of 244 students (90% of the population) was analysed using the Organizational Climate Measure (OCM) and the Organizational Culture Assessment Instrument (OCAI). The findings revealed significant differences between CCMA and ETM students in the human relations and hierarchy culture models, and between students enrolled in the 1st year of the CCMA and students enrolled in other years of the course in practically all analysed the models (except for the internal processes model). Furthermore, aside from 1st year students, the internal processes and market culture models were the only models where no differences were found. The data also showed that the dominant climates and cultures are the internal process model (hierarchy culture) and the rational goal model (market culture).

***Keywords*:** *Organizational Climate; Organizational Culture; Competing Values Framework.*

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[2] A notação utilizada é a presente no Aviso n.º 5817/2022, de 21 de março, e que substitui a anterior Curso de Mestrado em Aeronáutica Militar (CCMA).

[3] The designations used here are specified in Notice No. 5817/2022 of 21 March, which replaces the Master's degree in Military Aeronautics (CCMA).

1. Introdução

O comportamento humano, para além de ditado *ab initio* por características pessoais, entre outras variáveis, é também moldado pelo ambiente no qual o ser humano interage em contexto do local de trabalho, e por um conjunto alargado de características da organização (Berberoglu, 2018), tal como o Clima Organizacional e a Cultura Organizacional.

Apesar do Clima Organizacional e da Cultura Organizacional serem conceitos distintos, ainda que por vezes algo sobrepostos, ambos comungam o facto de se constituírem como facilitadores da compreensão de fenómenos psicológicos com semelhanças entre si e de serem úteis quando empregues de forma interligada, quer do ponto de vista conceptual, quer prático permitindo compreender a forma como os colaboradores experienciam a totalidade do seu ambiente de trabalho (Schneider & Barbera, 2014).

Neste enquadramento, o estudo do Clima Organizacional veio revelar a importância do ambiente de trabalho nas atitudes dos colaboradores para com a organização (Berberoglu, 2018; Schneider & Barbera, 2014), designadamente no seu sentido de pertença, nas relações interpessoais e na *performance* do indivíduo no trabalho (Mullins, 2010).

Por seu lado, o estudo da Cultura Organizacional surgido nas décadas de setenta e oitenta do século XX, muito fundeado na antropologia e na sociologia, e, enfatizando a mais-valia de caracterizar os grupos e identificar diferenças, sobretudo no tocante aos seus valores intrínsecos (Schneider & Barbera, 2014), revelou-se pertinente na medida em que permite (Cunliffe, 2008): modelar a imagem que os colaboradores e o meio externo têm da organização; estabelecer um rumo, com missão, visão e valores definidos; influenciar a *performance* organizacional; e ajudar a atrair e a reter colaboradores motivados, uma vez que as ditas "culturas fortes", cujos colaboradores com elas concordam e as assimilam, são as que têm um impacto acentuado no comportamento e no comprometimento desses mesmos colaboradores.

A presente investigação, ancorada no tema – *Clima e Cultura Organizacionais na Academia da Força Aérea* – justifica, assim, a sua pertinência:

– Teórica, face à preponderância que os construtos Clima Organizacional e Cultura Organizacional assumem na literatura da ciência organizacional, especificamente como indicadores do comportamento organizacional;

– Prática, no facto do seu estudo constituir-se como um conhecimento valioso para o decisor organizacional – neste caso particular, a Academia da Força Aérea (AFA) – que pretenda (re)equacionar e/ou (re)definir aspetos da sua política organizacional nesta matéria.

Adicionalmente, revela-se inovadora na medida em que se propõe a analisar, por um lado, e pela primeira vez, o Clima Organizacional na AFA, e, por outro, a "revisitar" uma investigação realizada em 2018 por Lopes, Fachada e Farinha, concernente à Cultura Organizacional neste Estabelecimento de Ensino Superior Público Universitário Militar (EESPUM)[4], consubstanciando-se como uma espécie de estudo quase-longitudinal (Saunders et al., 2009, p. 155). Inovadora, também, porque permite uma análise conjunta de duas variáveis percebidas como cruciais para a descrição e análise organizacional (Machado & Davim, 2018).

[4] Notação conforme com o predito no Decreto-Lei n.º 249/2015, de 28 de outubro.

A presente investigação tem como objeto de estudo o Clima Organizacional e a Cultura Organizacional na AFA, e encontra-se delimitada (Santos & Lima, 2019):

– Temporalmente, à atualidade (23 de dezembro de 2021, data limite de resposta aos questionários, com exceção do dia 21 de março, correspondente à data do Aviso n.º 5817/2022, que introduz a nova notação CCMA);

– Espacialmente, aos alunos do CCMA e ETM a efetuarem os seus estudos na AFA;

– De conteúdo, ao Clima Organizacional e Cultura Organizacional.

Neste seguimento, este estudo será norteado pela seguinte questão de investigação:

Como é que se caracteriza o Clima Organizacional e a Cultura Organizacional na Academia da Força Aérea?

Adicionalmente, tem como objetivo geral, *Analisar o Clima Organizacional e a Cultura Organizacional* experienciados pelos alunos da AFA, operacionalizado nos seguintes objetivos específicos: identificar diferenças de Clima Organizacional e de Cultura Organizacional entre as diferentes tipologias de formação ministradas na AFA e, ao nível do CCMA, entre os diferentes anos e especialidades; aferir a relação entre o Clima Organizacional e a Cultura Organizacional; e identificar tipologias dominantes de Clima e de Cultura Organizacionais da AFA.

2. Enquadramento teórico

Neste capítulo serão estudados os conceitos estruturantes da presente investigação, designadamente Clima e Cultura (organizacionais), seguindo-se uma breve análise comparativa de ambos e o levantamento das hipóteses que irão nortear esta investigação.

2.1. Clima Organizacional

A definição de Clima Organizacional apresenta múltiplas interpretações na literatura, tendo Verbeke et al. (1998) encontrado 32 aceções diferentes. Entre estas, têm-se, por exemplo, as que o referem como um "resultado" da perceção. Em concreto, Schneider e Reichers (1983), que o definiram como o conjunto de perceções partilhadas em relações às políticas organizacionais, as práticas e aos procedimentos que uma organização espera, apoia e recompensa, sendo, assim, um "fenómeno" de perceção e não uma característica objetiva de uma dada organização, e Caetano et al. (2020, p. 325), que o operacionalizaram como o "conjunto de características percebidas de uma unidade organizacional, induzidas pela [sua] forma de atuar […] e influenciadoras do comportamento individual, o qual, depende da personalidade do indivíduo e da perceção que o mesmo tem da envolvente".

Percebido como relativamente duradouro, o Clima Organizacional caracteriza-se (Moran & Volkwein, 1992): pelas perceções coletivas dos membros de uma organização sobre esta, no que respeita a dimensões como autonomia, confiança, coesão, apoio, reconhecimento, inovação e justiça; por ser produzido pela interação dos membros; por servir de base para a interpretação de uma dada situação organizacional; por refletir os valores normativos prevalecentes; e por servir como fonte de influência para a formação de comportamentos.

Segundo Schneider (1975), a literatura de Clima Organizacional ramifica-se em:

– clima global, que tem por objetivo estudar o ambiente no local de trabalho de uma

forma global (Kuenzi & Schminke, 2009), quantificando todas as variáveis situacionais a fim de prever todos os efeitos no ambiente organizacional ao nível dos grupos e dos indivíduos (Litwin & Stringer, 1968);

– climas específicos, focados em aspetos específicos da organização (Schneider, 1975).

Esta especialização do estudo dos climas nas organizações, levou à fragmentação na literatura de Clima Organizacional, uma vez que os climas foram-se "compartimentalizando", deixando de haver um Clima Organizacional para começarem a existir diversos climas específicos (Kuenzi & Schminke, 2009).

Atualmente a investigação do clima tende a estudar climas específicos ao nível da organização, do grupo e/ou do indivíduo (Caetano et al., 2020).

2.2. Cultura Organizacional

Conceptualmente, Powell et al. (2021) identificaram na literatura 54 definições de Cultura Organizacional, entre as quais figura a de Schneider et al. (2017), que a definiram como os valores partilhados e os pressupostos básicos que levam à explicação do porquê de as organizações fazerem o que fazem e focarem-se no que focam, e a de outros autores, que a percecionaram como um conjunto de artefactos, valores e assunções que emergem da interação entre os membros de uma organização (Keyton, 2011), resultantes de uma criação local pelos indivíduos, e capazes, por outro lado, de criar efeitos particulares nas pessoas (Parker, 2000).

Para Parker (2000) a cultura e a organização são conceitos isomórficos e indissociáveis, que se aprofundam um ao outro, sendo que as organizações não têm uma cultura, mas são, isso sim, uma cultura (Smircich, 1983).

Adicionalmente, autores existem, como Schein (2016), para quem a cultura pode ser analisada à luz de três níveis, correspondentes a diferentes graus de abstratividade, designadamente:

– *Artefactos*, que correspondem a tudo aquilo que é possível ser observado, ouvido ou sentido na organização. Um nível fácil de observar, mas difícil de decifrar, pois o observador externo à organização consegue descrever o que vê, não lhe sendo, contudo, possível (com base numa única observação) reconstruir o significado que tais atos têm para os elementos do grupo.

– *Valores e Crenças*, que correspondem ao processo em que o grupo, face a um novo desafio, chega a uma solução conjunta (percebida de forma coletiva como boa e adequada, e, por conseguinte, socialmente validada), que se transforma gradualmente num valor ou numa crença, e, por fim, numa assunção partilhada que constitui-se como uma espécie de guia de como lidar com a incerteza de eventos intrinsecamente incontroláveis ou difíceis, reduzindo assim a incerteza em áreas críticas do funcionamento do grupo.

– *Pressupostos básicos,* que correspondem a, ou resultam de uma repetida e bem-sucedida aplicação de uma dada solução conjunta. Solução conjunta esta que passa, assim, a ser interiorizada pelo grupo como a ação a tomar em contextos similares, existindo pouca tolerância para com aquilo que é diferente ou que é o contrário.

2.3. Clima versus Cultura

Considerando a origem e evolução dos conceitos, notam-se diferenças em relação ao início do seu estudo (James et al., 2008) e diferenças nas áreas do saber do qual têm a sua génese (Schneider, 2000), com a cultura a surgir do domínio da antropologia e o clima da psicologia (Kuenzi & Schminke, 2009).

Para além disso a cultura estuda dimensões profundamente enraizadas na organização enquanto que as dimensões de clima, para além de diferentes, são mais superficiais, o que permite estabelecer uma diferença clara no tocante ao grau de abstração, com a cultura a ser mais abstrata que o clima (Kuenzi & Schminke, 2009).

Também há diferença relativamente à mutabilidade dos dois conceitos, com a cultura a tender a ter grande estabilidade e o clima a ser relativamente temporário (Denison, 1996).

Complementarmente, referiram Falcione e Kaplan (1985) que enquanto o clima foca o momento presente e constitui um indicador do quão bem se adequam as pessoas na cultura da organização, a Cultura Organizacional captura o histórico.

Schein (2010), por seu lado, enfatizou que ao contrário do clima que é observável, porque percebido como o sentimento que é transmitido num grupo pela disposição física e a forma como os membros das organizações interagem com os outros, a cultura é abstrata.

Contudo, os dois construtos não são totalmente incongruentes, mas complementares, dado que o Clima Organizacional, por decorrer naturalmente da Cultura Organizacional traduz-se na expressão mais visível da cultura, ou seja, a Cultura Organizacional expressa-se pelo Clima Organizacional (Saraiva & Almeida, 2017).

2.4. Modelo dos Valores Contrastantes

2.4.1. Da eficácia organizacional ao Modelo dos Valores Contrastantes

O debate que levou ao desenvolvimento do modelo dos valores contrastantes partiu do conceito da eficácia organizacional, analisada de uma forma tridimensional (do foco, da estrutura e do horizonte temporal) (Quinn & Rohrbaugh, 1981).

A primeira dimensão (eixo do x) está relacionada com o *Foco*, que, do ponto de vista (Quinn & Rohrbaugh, 1981, 1983):

– Interno, associa-se ao bem-estar e desenvolvimento dos indivíduos na organização, sendo a organização um sistema social em que os participantes têm sentimentos, gostos e requerem consideração, informação apropriada e estabilidade;

– Externo, relaciona-se com o bem-estar e desenvolvimento da organização por si só, sendo a organização uma ferramenta com o objetivo último de completar as suas tarefas e adquirir recursos, dando ênfase à competitividade.

A segunda dimensão (eixo do y) está relacionada com a estrutura da organização, enfatizando o controlo (o primado na autoridade, estrutura, coordenação e estabilidade) ou, pelo contrário, a *flexibilidade* (realçando a diversidade, mudança, iniciativa individual e adaptabilidade organizacional) (Quinn & Rohrbaugh, 1981, 1983).

A terceira dimensão (eixo do z ou de profundidade) opõe *meios e fins*, ou seja, os processos importantes como planeamento e determinação de objetivos versus os objetivos, como a obtenção de resultados e produtividade (Quinn & Rohrbaugh, 1981, 1983).

Da combinação destas dimensões, decorrem quatro quadrantes, que correspondem (Quinn, 1988; Quinn & Rohrbaugh, 1983) ao modelo das(os):

– Relações Humanas, que enfatiza a estrutura flexível, coloca o foco nos indivíduos e abrange conceitos como a coesão e moral (meios) e o desenvolvimento de recursos humanos (fins);

– Processos Internos, que enfatiza a rigidez da estrutura, mantém o foco nos indivíduos e abrange conceitos como a informação da gestão e comunicação (meios) e a estabilidade e controlo (fins);

– Sistemas Abertos, que enfatiza a estrutura flexível, coloca o foco na organização e abrange conceitos como a flexibilidade e prontidão (meios) e o crescimento e aquisição de recursos (fins);

– Objetivos Racionais, que enfatiza rigidez da estrutura, coloca o foco na organização e abrange conceitos como o planeamento e definição de objetivos (meios) e a produtividade e eficiência (fins).

Do ponto de vista organizacional, o modelo dos valores contrastantes permite compreender as estruturas simples que servem de alicerce a todas as atividades organizacionais e as dimensões que emergiram do estudo da eficácia organizacional podem ser aplicadas a diversos aspetos organizacionais (Cameron et al., 2006; Hartnell et al., 2011), como o clima (Patterson et al., 2004; Beus et al., 2020) e a cultura (Cameron et al., 2006; Cameron & Quinn, 2011; Hartnell et al., 2011).

2.4.2. Modelo dos Valores Contrastantes aplicado ao Clima Organizacional

Uma vez que o estudo do Clima Organizacional divide-se em duas macro correntes de pensamento (Schneider & Barbera, 2014) e constatando que as duas abordagens trazem vantagens, Patterson et al. (2004) consideraram o clima global e o clima específico como faces opostas da mesma moeda e utilizaram como base o modelo dos valores contrastantes de Quinn e Rohrbaugh (1983), para descrever o Clima Organizacional, dada a inexistência de um modelo de Clima Organizacional bem fundamentado, ou consenso sobre as dimensões da variável.

Neste enquadramento, Patterson et al. (2004), propuseram 17 dimensões (inovação e flexibilidade agrupadas numa mesma), organizadas numa estrutura baseada no modelo dos valores contrastantes (Figura 1), e definidas da seguinte forma:

– Autonomia, quão bem determinadas estão as funções dos colaboradores de forma a que lhes dê a liberdade de ação necessária para realizarem o seu trabalho;

– Integração, grau de confiança entre partes da organização e a cooperação entre elas;

– Participação, quantificação da influência dos colaboradores sobre a tomada de decisão, previsibilidade e eficiência;

– Apoio da supervisão, grau de apoio e compreensão do chefe em relação aos colaboradores;

– Formação, quantificação da preocupação com o desenvolvimento das capacidades dos colaboradores;

– Formalização, a ênfase dada às regras formais e aos procedimentos;

– Tradição, quão valorizadas são as formas de operação estabelecidas;

– Reflexividade, grau de preocupação em rever e refletir sobre objetivos, estratégias e processos;

– Inovação e Flexibilidade, apoio e encorajamento de ideias/abordagens inovadoras e orientação para a mudança;

– Foco exterior, grau de resposta da organização às necessidades do mercado;

– Claridade de objetivos, quantificação da preocupação pela clara definição dos objetivos organizacionais;

– Pressão para produzir, quão pressionados são os colaboradores para produzirem;

– Qualidade, a ênfase dada aos procedimentos com qualidade;

– *Feedback* de desempenho, a medição e *feedback* dado sobre o desempenho do trabalho;

– Eficiência, grau de importância dado à eficiência e produtividade;

– Esforço, grau de esforço dos colaboradores em atingir objetivos.

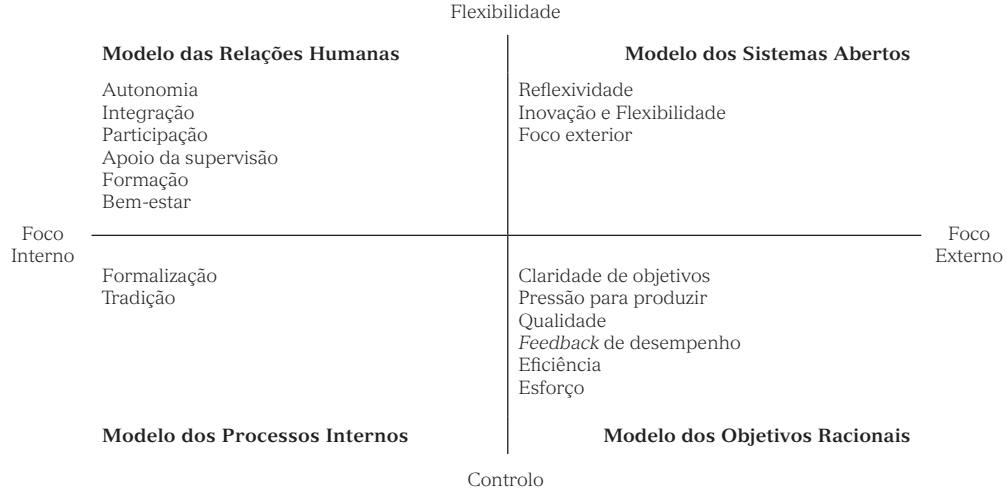

Figura 1 – Modelo dos Valores Contrastantes aplicado ao Clima Organizacional
Fonte: Criado a partir de Patterson et al. (2004).

2.4.3. Modelo dos Valores Contrastantes aplicado à Cultura Organizacional

O modelo dos valores contrastantes aplicado ao estudo da Cultura Organizacional integra e organiza muitas das dimensões propostas na literatura (Cameron & Quinn, 2011).

Para o feito, a conjunção dos dois eixos forma quatro quadrantes (Cameron & Quinn, 2011; Hartnell et al., 2011; Ployhart et al., 2014), correspondendo, a cada um, um tipo específico de cultura (Cameron et al, 2006; Cameron & Quinn, 2011) (Figura 2).

Figura 2 – Modelo dos Valores Contrastantes aplicado à Cultura Organizacional
Fonte: Adaptado a partir de Cameron e Quinn (2011, p. 53).

Os quatro decorrentes tipos de cultura (Figura 2) correspondem, em concreto, à (Cameron & Quinn, 2006; Caseiro, 2012):

– Cultura de Clã, caracterizada pela identificação da organização como uma grande família, em que o colaborador partilha muito sobre si próprio. O comprometimento é elevado, a coesão e a moral são importantes, e tem por elementos aglutinadores a lealdade e a tradição. O sucesso é definido pela preocupação com os colaboradores e com o clima interno;

– Cultura Adocrática, associada a dinamismo e empreendedorismo, valorizando a experimentação, inovação e, se necessário, mudança, a fim da organização poder manter-se na vanguarda do conhecimento e obter sucesso na criação de produtos e serviços, originais e únicos;

– Cultura Hierárquica, pautada pela formalidade, estruturação e pelo primado dos procedimentos e regras. Os líderes são coordenadores e organizadores eficientes, que permitem que a organização opere sem percalços e que, a longo prazo, atinja estabilidade, previsibilidade e eficiência;

– Cultura de Mercado, orientada para a competitividade e para a obtenção de melhores resultados face à concorrência. A liderança é exigente, competitiva e enfatiza a necessidade de cumprir os objetivos comerciais estabelecidos a longo prazo.

2.5. Hipóteses de investigação

Na AFA são ministradas duas tipologias de curso associadas à formação dos futuros oficiais dos quadros permanentes (QP) da Força Aérea (FA). São elas:

– O Curso de Mestrado em Aeronáutica Militar (CCMA), composto predominantemente por alunos oriundos do ensino secundário civil, com uma duração ("média") de até seis anos[5]

[5] Esta "média" prende-se com o facto do curso PILAV ter uma duração de 5 anos letivos e 1 semestre e as restantes especialidades 6 (AFA, 2015), não sendo incomum suceder, na prática, a permanência dos alunos por mais um/dois anos (perfazendo um total de 7/8 anos), por razões operacionais (tais como, não aproveitamento académico, indisponibilidade de aeronaves para realização de voos/meteorologia no caso dos PILAV). Uma realidade que justifica a decisão do presente estudo alargar-se a alunos com 7 anos na AFA".

(consoante a área de especialidade, designadamente, pilotagem aeronáutica, administração aeronáutica, engenharias e medicina) (AFA, 2015).

– O Estágio Técnico Militar (ETM), composto por militares com formação superior e que receberam formação militar inicial no Centro de Formação Militar e Técnica da Força Aérea (CFMTFA) (Aviso n.º 3243/2021, de 23 de fevereiro) – embora casos existam daqueles que ingressam diretamente do meio civil (caso, por exemplo, de psicólogos, juristas e médicos, conforme, por exemplo, o predito no Aviso n.º 3245/2021, de 23 de fevereiro – com uma duração de um semestre letivo e igualmente destinado ao ingresso nos QP (Despacho n.º 10545/2021, de 27 de outubro).

Para além do diferente tempo de formação entre alunos CCMA e ETM na AFA, os últimos apresentam, *a priori*, uma heterogeneidade maior, fruto do facto de cada aluno ETM já ter tido, *ab initio*, várias e diferentes experiências de "contacto com a" e de "trabalho na" FA (exceto psicólogos, médicos e juristas). Dito por outras palavras, fruto do facto de já apresentarem, aquando do seu ingresso na AFA, perceções muito próprias e algo solidificadas da vivência e formação militar, decorrente de serem oriundos de diferentes categorias bem como locais de colocação. Esta realidade, somada ao facto de maiores diferenças de idade num grupo terem um impacto negativo na identificação organizacional do mesmo (Innocenti et al., 2013), justifica-se levantar a hipótese seguinte:

H1: Existem diferenças de Clima Organizacional entre os alunos do CCMA e do ETM

Apesar do CCMA e do ETM estarem a ser formados num espaço comum (a AFA), onde os alunos estão sujeitos a semelhantes vivências, a diferente duração dos cursos e as idiossincrasias prévias ao seu ingresso na AFA (como seja, o facto da maioria dos alunos de ETM já deter, a montante, alguma formação de âmbito militar, a par de experiência afim) – à luz do predito por Hofstede (1991), de que os indivíduos ao integrarem nova organização, levam para o coletivo a sua cultura, e por Parker (2000), de que organização e cultura são conceitos indissociáveis –, justifica-se levantar a seguinte hipótese:

H2: Existem diferenças de Cultura Organizacional entre os alunos do CCMA e do ETM

Conforme referiram Guzzo et al. (2014), o Clima Organizacional caracteriza-se por múltiplos climas ("microclimas"), que diferem entre os subgrupos dentro da organização, subgrupos estes que, no caso do CCMA, podem repercutir-se nos diferentes anos. Neste enquadramento deduz-se o levantamento da seguinte hipótese:

H3: Existem diferenças de Clima Organizacional entre os alunos dos diferentes anos do CCMA

Por seu lado, ao nível da Cultura Organizacional, a hipótese abaixo, justifica-se levantar considerando o advogado por:

– Schein (2016), de que nas organizações que atingem grandes dimensões, as suas subunidades desenvolvem subculturas próprias derivadas da cultura predominante, que, no

caso da AFA, poderá ser transponível para a eventual existência de culturas próprias a cada um dos anos;

– Hofstede (1991), relativamente ao facto das organizações poderem ser culturalmente divisíveis de acordo com os diferentes níveis hierárquicos dos seus membros e com as funções que desempenham, que, no caso da AFA, poderá refletir-se no facto dos diferentes anos académicos, a par do seu distinto desempenho de funções no funcionamento académico-militar da estrutura de alunos, poderem estar situados em diferentes estádios de aculturação à Instituição;

– Reichers (1987), de que o contexto da instrução ministrada fornece aos membros sinais que permitem depreender características da Cultura Organizacional, que, no caso da AFA, poderá repercutir-se em diferentes aceções de cultura, fruto de diferentes *curricula* programáticos, docentes e metodologias de formação.

H4: Existem diferenças de Cultura Organizacional entre os alunos dos diferentes anos do CCMA

Centrando nas premissas de Saraiva e Almeida (2017), que enfatizaram que o clima decorre naturalmente da cultura (i.e., a Cultura Organizacional expressa-se através do Clima Organizacional), de Fontes (2011), em que o clima afigura-se como componente superficial da cultura, e de Keyton (2011) para quem, tal como suprarreferido, o clima é uma manifestação da cultura, levanta-se a seguinte hipótese:

H5: Existe relação entre o Clima Organizacional e a Cultura Organizacional da AFA

3. Metodologia e Método

3.1. Metodologia

Metodologicamente, o presente estudo assenta num raciocínio dedutivo, por partir do geral, da teoria, para o particular (Santos & Lima, 2019, p. 19), associado a uma estratégia de investigação quantitativa e a um desenho de pesquisa do tipo estudo de caso.

3.2. Método

3.2.1. Participantes e procedimento

Participantes. Integraram a fase de pré-teste sete potenciais participantes previamente selecionados, de diferentes anos e especialidades/áreas de atividade. Integraram a fase de teste 233 alunos do CCMA (91% de N = 256) e 11 alunos do ETM (73% de N = 15), maioritariamente do CCMA (especificamente PILAV = 99 e Engenharias = 88) e com idades no intervalo [18, 21], n = 155) (Tabela 1).

Tabela 1 – Análise descritiva da amostra

Variável			n
Áreas de atividade[6]			
	CCMA	PILAV	99
		Engenharias	88
		ADMAER	36
		MED	10
	ETM	Apoio	6
		Manutenção	1
		Operações	4
Idades			
	18 – 21		155
	22 – 25		76
	26 – 29		4
	30 – 33		8
	34 – 37		1

Procedimento. Os potenciais participantes foram informados dos objetivos do estudo e de que a informação recolhida se destinava, única e exclusivamente, à realização da presente investigação, ou de uma investigação posterior enquadrada na mesma temática e mediante a autorização do autor. Foram, ainda, dadas garantias de anonimato e confidencialidade das respostas. Num momento contíguo, o inquérito por questionário – desenvolvido com recurso à ferramenta *Google Forms* –, foi endereçado a cada potencial respondente, quer na fase de pré-teste (21 a 23 de novembro de 2021) quer na de teste (9 a 23 de dezembro de 2021).

3.2.2. Instrumentos de recolha de dados

Foi elaborado um inquérito por questionário, constituído por três partes. A primeira, referente à recolha dos dados sociodemográficos dos participantes na investigação. As duas restantes orientadas, respetivamente, para o estudo do Clima Organizacional e da Cultura Organizacional, conforme abaixo detalhado.

Medida de Clima Organizacional (*Organizational Climate Measure* [OCM]). Foi utilizada uma versão adaptada pelo autor do OCM de Patterson et al. (2004)[7], composta por 52 itens,

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[6] As áreas de atividade do ETM analisadas são as que se encontram em processo formativo, decorrente dos avisos de abertura de 2021.

[7] Tal como realizado por Diniz e Fachada (2019, p. 17), "o estudo de adaptação desta escala seguiu o procedimento utilizado por Fachada (2015, p. 43), iniciando-se com a sua tradução (do inglês para o português, corrente e fluente), desenvolvida pelo autor desta [dissertação] (possuidor de um elevado nível de ING)" e, de forma cega, por um militar colocado no departamento de línguas da AFA com acreditação de proficiência em língua inglesa correspondente ao nível C2 (Mestria) do Quadro Europeu Comum de Referência para as Línguas. Posteriormente, e também conforme Diniz e Fachada (2019, p. 17), "realizou-se uma verificação desta versão por duas pessoas em separado, [docentes da disciplina de inglês na Academia], comparando-se, no final, as versões obtidas." Esta foi submetida à retroversão por um docente do departamento de línguas da AFA. A versão final, resultante da comparação da versão retrovertida com a escala original, que se apresentaram muito próximas, foi sujeita a pré-teste.

respondidos numa escala tipo *Likert* de 4 pontos (1 = Discordo totalmente e 4 = Concordo totalmente), e agrupados em onze dimensões, por sua vez integradas em três modelos (Relações Humanas, Processos Internos e Objetivos Racionais). Estas dimensões apresentaram índices de fidelidade (α de *Cronbach*[8]) entre 0.67 e 0.91, considerados, respetivamente, fraco e excelente, por Hill e Hill (2002, p. 149).

Instrumento de Avaliação da Cultura Organizacional (*Organizational Culture Assessment Instrument* [OCAI]). Foi utilizada a versão adaptada por Lopes et al. (2018) para o contexto da AFA, a partir da versão traduzida e validada para o contexto português por Machado (2002) do OCAI, composta por 26 itens, respondidos numa escala tipo *Likert* de 5 pontos (1 = Discordo totalmente e 5 = Concordo totalmente), agrupáveis em quatro tipos de cultura (Cultura de Clã, Cultura Hierárquica, Cultura Adocrática e Cultura de Mercado), e associados a índices de fidelidade entre 0.71 e 0.79, considerados como razoáveis (Hill, & Hill, 2002, p. 149).

3.2.3. Técnicas de tratamento de dados

O tratamento dos dados recolhidos foi feito com recurso aos programas *Statistical Package for the Social Sciences* (SPSS 28.0) e *Jeffreys's Amazing Statistics Program* (JASP 0.16.0.0).

4. Análise dos resultados

Apresentam-se aqui a análise psicométrica dos instrumentos utilizados, feita com recurso a análises de fiabilidade e análise fatorial confirmatória, e a análise de diferenças de médias.

4.1. Análise psicométrica dos instrumentos

4.1.1. Análise de fiabilidade

A fiabilidade dos instrumentos de medição pode ser quantificada de diversas formas, entre as quais o Alfa de *Cronbach* (Sampieri et al., 2013).

No questionário referente ao Clima Organizacional constam 52 itens divididos em três modelos. Na análise de fiabilidade da dimensão autonomia, verificou-se a existência de um valor de Alfa de *Cronbach* igual a 0.448, considerado inaceitável[9],porém a eliminação dos itens K3 e K5 elevaram o valor do índice para α = 0.645 (considerado fraco). Na análise de fiabilidade da dimensão tradição, verificou-se a existência de um valor de Alfa de *Cronbach* igual a 0.597 (inaceitável), que, fruto da eliminação do item K37 originou um Alfa de *Cronbach* da dimensão igual α = 0.611 (fraco).

Apesar da escala OCM (Tabela 2) apresentar um Alfa de *Cronbach* igual a 0.941 (considerado excelente), o modelo dos Processos Internos, que apresenta o menor Alfa, tem um valor igual

[8] Coeficiente Alfa de *Cronbach*, classificado de fraco, se situado no [0.6 ; 0.7[, razoável no [0.7 ; 0.8[, bom no [0.8 ; 0.9[e excelente se ≥ 0,9 (Hill, & Hill, 2002).

[9] Conforme Hill e Hill (2002, p. 149) valores Alfa de *Cronbach*: ≥ 0.9 são excelentes; [0.8 ; 0.9[são bons; [0.7 ; 0.8[são razoáveis; [0.6 ; 0.7[são fracos; e < 0.6 são inaceitáveis. Doravante, as conclusões concernentes à "qualidade" dos Alfa de *Cronbach*, irão versar, por defeito, esta taxonomia de Hill e Hill (2002, p. 149), uma fonte que, para obviar frequentes e desnecessárias repetições, não será sempre explicitada.

a 0.505 (inaceitável). Segundo Pallant (2020) o Alfa de *Cronbach* é sensível ao número de itens, constituindo-se, assim, uma exceção à comparação, por defeito, com a taxonomia de Hill e Hill (2002), a aceitabilidade de Alfas superiores ou iguais a 0.5 para n < 10, uma vez que os valores da correlação item-total são positivos no modelo dos Processos Internos.

Tabela 2 – Alfas de *Cronbach* dos fatores e dimensões de Clima Organizacional

Modelo	α	Dimensão	Número de Itens	α
Relações Humanas	0.938	Autonomia	3	0.645
		Integração	5	0.715
		Participação	6	0.826
		Apoio da Supervisão	5	0.903
		Formação	4	0.776
		Bem-estar	4	0.893
Processos Internos	0.505	Formalização	5	0.723
		Tradição	3	0.611
Objetivos Racionais	0.871	Esforço	4	0.706
		Feedback de desempenho	5	0.818
		Qualidade	4	0.706

Na escala aplicada referente a Cultura Organizacional, constam 26 itens divididos em quatro modelos. Na análise de fiabilidade do modelo de Cultura Hierárquica, verificou-se a existência de um valor de Alfa de *Cronbach* igual a 0.611 (fraco), o qual, fruto da eliminação do item C12 originou um Alfa de *Cronbach* da dimensão igual α = 0.631. Na análise de consistência interna do modelo de Cultura de Mercado, verificou-se a existência de um valor de Alfa de *Cronbach* igual a 0.580 (inaceitável), que, com a eliminação dos itens C7 e C19 originou um Alfa de *Cronbach* da dimensão igual α = 0.751 (razoável).

A Tabela 3 apresenta os valores de Alfa de *Cronbach* correspondentes aos quatro modelos da Cultura Organizacional. A escala OCAI apresenta um Alfa com valor 0.920, o que indica que o índice global de consistência interna da escala é considerado excelente (Hill & Hill, 2002). Os modelos de Cultura de Clã e Adocrática apresentam boa consistência interna, o modelo de Cultura de Mercado apresenta consistência interna razoável e o modelo de Cultura Hierárquica mostra-se com uma consistência interna fraca. A existência de um Alfa de *Cronbach* com valor abaixo do razoável para o modelo de Cultura Hierárquica desta escala, já fora detetada para o contexto militar (α = 0.69) (Pierce, 2010) e para o contexto específico da AFA (α = 0.65) (Lopes et al., 2018).

Tabela 3 – Alfas de *Cronbach* dos fatores de Cultura Organizacional

Modelo	Número de Itens	α
Clã	6	0.844
Adocrática	6	0.828
Hierárquica	5	0.631
Mercado	4	0.751

4.1.2. Análise fatorial confirmatória

A fim de melhor aquilatar acerca da congruência teórica, foi efetuada uma análise fatorial confirmatória (AFC) com a solução original de 3F de clima e 4F de cultura, da qual resultaram os diagramas presentes nas Figuras 3 a 6.

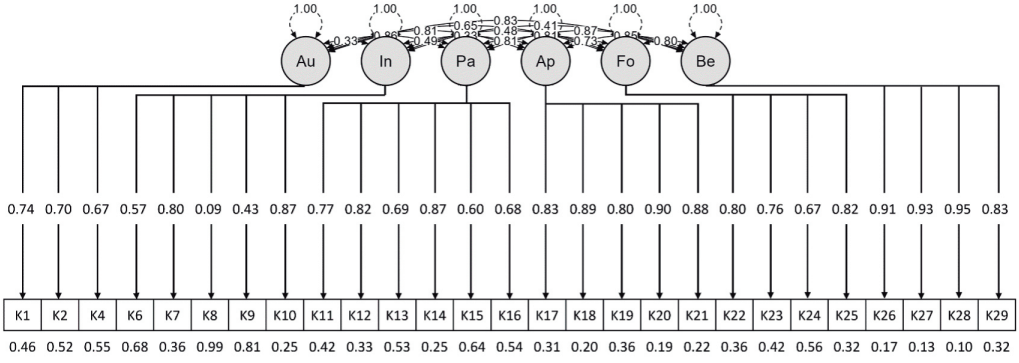


Figura 3 – Modelo da AFC do modelo das Relações Humanas

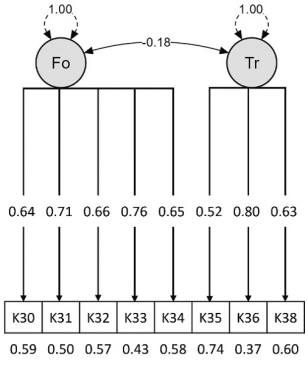


Figura 4 – Modelo da AFC do modelo dos Processos Internos

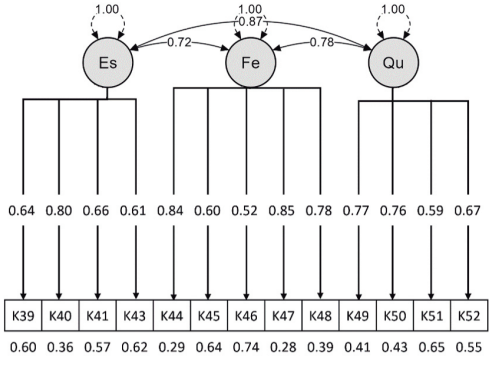


Figura 5 – Modelo da AFC do modelo dos Objetivos Racionais

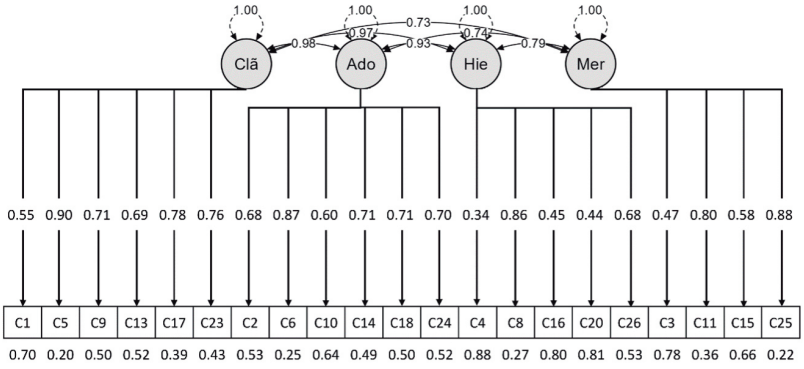


Figura 6 – Modelo da AFC da variável Cultura Organizacional

Neste âmbito, da AFC aos fatores de clima, e com a eliminação do item K42 (da dimensão esforço do modelo dos Objetivos Racionais) obtiveram-se os índices de bondade de ajustamento apresentados na Tabela 4. Quanto aos fatores de cultura, a AFC, conforme com a original, apresentou adequados índices de bondade de ajustamento. De uma forma mais concreta, os índices de bondade de ajustamento apresentados na Tabela 4, correspondem: valores de CFI e TLI, classificados como bons em todos os modelos de Clima e Cultura Organizacionais; valores de RMSEA classificados como desejáveis nos modelos de Relações Humanas e Cultura de Clã, e como bons nos restantes; e valores de SRMR classificados como desejáveis em todos os modelos das duas variáveis (Tabachnick & Fidell, 2019).

Tabela 4 – Índices de bondade de ajustamento da AFC[10]

		CFI	TLI	RMSEA	SRMR
Clima Organizacional	Relações Humanas	0.992	0.991	0.067	0.074
	Processos Internos	0.983	0.975	0.057	0.067
	Objetivos Racionais	0.992	0.990	0.053	0.062
Cultura Organizacional	Clã	0.994	0.990	0.080	0.054
	Adocrática	0.996	0.994	0.054	0.041
	Hierárquica	0.993	0.985	0.050	0.045
	Mercado	1.000	1.000	0.000	0.012

4.2. Análise de diferenças de médias

Analisam-se aqui as diferenças de médias das variáveis Clima e Cultura Organizacionais entre tipologias de formação e anos e especialidade, bem como as correlações entre os modelos.

[10] CFI e TLI classificados como bons se ≥ 0.95, RMSEA classificado como bom se ≤ 0.06 e desejável]0.06 ; 0.10], e SRMR classificados como desejáveis ≤ 0.08 (Tabachnick & Fidell, 2019, pp. 560-564).

4.2.1. Diferenças de médias da variável Clima Organizacional

Dada a diferença significativa entre as dimensões das subamostras compostas por alunos do CCMA (n = 233) e do ETM (n = 11), foi utilizado o teste não paramétrico *Mann-Whitney*, tendo-se registado como significativas ($p < 0.05$) as diferenças de médias relativas ao modelo das Relações Humanas entre os alunos CCMA e ETM (Tabela 5).

Tabela 5 – Teste *Mann-Whitney* dos fatores da variável Clima Organizacional

Modelo	Amostras	n	Média[11]	Desvio Padrão	Significância
Relações Humanas	CCMA	233	2.352	0.529	**0.012**
	ETM	11	2.748	0.424	
Processos Internos	CCMA	233	2.954	0.410	0.063
	ETM	11	3.209	0.330	
Objetivos Racionais	CCMA	233	2.943	0.518	0.173
	ETM	11	3.122	0.344	

A significância da diferença de médias do modelo das Relações Humanas justificou a realização de um teste *Mann-Whitney* às dimensões do modelo, que permitiu concluir que tal se deve a uma maior perceção de apoio da supervisão ($p < 0.01$) por parte dos alunos ETM (Tabela 6).

Tabela 6 – Teste *Mann-Whitney* das dimensões do modelo das Relações Humanas

Modelo	Amostras	n	Média	Desvio Padrão	Significância
Autonomia	CCMA	233	1.681	0.549	0.125
	ETM	11	1.939	0.512	
Integração	CCMA	233	2.898	0.535	0.057
	ETM	11	3.255	0.482	
Participação	CCMA	233	2.042	0.633	0.059
	ETM	11	2.394	0.651	
Apoio da Supervisão	CCMA	233	2.334	0.775	**0.004**
	ETM	11	2.946	0.336	
Formação	CCMA	233	2.697	0.688	0.058
	ETM	11	3.046	0.445	
Bem-estar	CCMA	233	2.461	0.835	0.068
	ETM	11	2.909	0.701	

[11] Apesar do teste *Mann-Whitney*, por ser não paramétrico, determinar a significância da diferença de medianas, são apresentadas nas tabelas as médias dos itens dos modelos indicados correspondentes às subamostras em estudo, por terem valor descritivo acrescido ao facilitarem a comparação de médias independentemente dos tipos de testes utilizados.

A Tabela 7 mostra o resultado do teste *One-Way* ANOVA com correção de *Welch*, necessária devido à significativa diferença de dimensão das amostras e/ou heterogeneidade de variâncias, aplicado aos diferentes anos relativamente ao modelo das Relações Humanas. Da correção de *Welch* resultou um índice com significância de valor igual a 0.000, que corrobora a significância da existência de diferença de médias entre anos (Tabela 7).

Tabela 7 – Teste *One-Way* ANOVA do modelo de Relações Humanas

Modelo	Amostras	n	Média	Desvio Padrão	Significância
Relações Humanas	1.º ano	44	3.131	0.271	**0.000**
	2.º ano	73	2.204	0.420	
	3.º ano	30	2.211	0.472	
	4.º ano	33	2.112	0.307	
	5.º ano	23	2.125	0.324	
	6.º ano	19	2.155	0.390	
	7.º ano na AFA	11	2.142	0.379	
Total		233	2.352	0.529	

A Tabela 8 expõe a significância do teste *post-hoc Games-Howell*, utilizado por haver heterocedasticidade, concluindo-se, da sua análise, que existem diferença de médias significativa entre os alunos do 1.º ano e dos restantes anos ($p < 0.001$).

Tabela 8 – Teste *post-hoc Games-Howell* do modelo das Relações Humanas

Sig.	1.º ano	2.º ano	3.º ano	4.º ano	5.º ano	6.º ano	7.º ano na AFA
1.º ano	1						
2.º ano	**0.000**	1					
3.º ano	**0.000**	1.000	1				
4.º ano	**0.000**	0.863	0.956	1			
5.º ano	**0.000**	0.964	0.986	1.000	1		
6.º ano	**0.000**	0.999	0.999	1.000	1.000	1	
7.º ano na AFA	**0.000**	0.999	0.999	1.000	1.000	1.000	1

O teste *One-Way* ANOVA foi da mesma forma aplicado para o modelo de Processos Internos, o qual revelou não haver diferença significativa ($p > 0.05$) entre as médias (Tabela 9).

Tabela 9 – Teste *One-Way* ANOVA do modelo dos Processos Internos

Modelo	Amostras	n	Média	Desvio Padrão	Significância
Processos Internos	1.º ano	44	2.961	0.284	0.428
	2.º ano	73	2.952	0.378	
	3.º ano	30	2.986	0.458	
	4.º ano	33	2.974	0.485	
	5.º ano	23	2.752	0.441	
	6.º ano	19	3.059	0.499	
	7.º ano na AFA	11	3.036	0.401	
Total		233	2.954	0.410	

Nas Tabelas 10 e 11 são apresentadas as médias do modelo dos Objetivos Racionais resultantes da ANOVA e a significância de diferença de médias produzidas pelo teste *post-hoc Games-Howell,* utilizado por haver heterocedasticidade. A Tabela 10 demonstra haver diferenças significativas (p <0.001) de médias dos alunos CCMA quanto ao modelo dos Objetivos Racionais, da análise da Tabela 11 depreende-se que há diferença de médias significativas entre o 1.º ano CCMA e todos os outros alunos ($p < 0.001$), e entre os alunos CCMA dos 4.º ($p < 0.05$), 5.º ($p < 0.01$) e 6.º ($p < 0.01$) anos em comparação com os do 2.º ano.

Tabela 10 – Teste *One-Way* ANOVA do modelo dos Objetivos Racionais

Modelo	Amostras	n	Média	Desvio Padrão	Significância
Objetivos Racionais	1.º ano	44	3.661	0.245	**0.000**
	2.º ano	73	2.945	0.378	
	3.º ano	30	2.804	0.456	
	4.º ano	33	2.702	0.348	
	5.º ano	23	2.516	0.412	
	6.º ano	19	2.557	0.323	
	7.º ano na AFA	11	2.729	0.331	
Total		233	2.944	0.518	

Tabela 11 – Teste *post-hoc Games-Howell* do modelo dos Objetivos Racionais

Sig.	1.º ano	2.º ano	3.º ano	4.º ano	5.º ano	6.º ano	7.º ano na AFA
1.º ano	1						
2.º ano	**0.000**	1					
3.º ano	**0.000**	0.748	1				
4.º ano	**0.000**	**0.029**	0.953	1			
5.º ano	**0.000**	**0.002**	0.216	0.575	1		
6.º ano	**0.000**	**0.001**	0.305	0.734	1.000	1	
7.º ano na AFA	**0.000**	0.463	0.997	1.000	0.673	0.804	1

Uma vez que o teste *post-hoc Games-Howell* (Tabela 11) mostrou haver diferença significativa de médias do modelo dos Objetivos Racionais entre o 2.º ano e os 4.º ($p < 0.05$), 5.º ($p < 0.01$) e 6.º ($p < 0.01$) anos, procedeu-se à análise das dimensões do modelo. O resultado do teste *Mann-Whitney* (Tabela 12) justifica a diferença, por o 2.º ano ter perceções de esforço ($p < 0.001$) e qualidade ($p < 0.001$) superiores aos 4.º, 5.º e 6.º anos.

Tabela 12 – Teste *Mann-Whitney* das dimensões do modelo dos Objetivos Racionais

Modelo	Amostras	n	Média	Desvio Padrão	Significância
Esforço	2.º ano	73	3.065	0.402	**0.000**
	4.º, 5.º e 6.º anos	75	2.627	0.547	
Feedback de desempenho	2.º ano	73	2.548	0.626	0.089
	4.º, 5.º e 6.º anos	75	2.381	0.463	
Qualidade	2.º ano	73	3.223	0.472	**0.000**
	4.º, 5.º e 6.º anos	75	2.817	0.528	

Utilizou-se o teste de amostras independentes *t-Student* para estudar a diferença de médias dos fatores de Clima Organizacional entre alunos internos e alunos semi-internos.

Nos anos em que os alunos semi-internos frequentam uma Instituição de Ensino Superior Público (IESP), ou seja, dos 4.º ao 7.º anos na AFA, como mostra a Tabela 13, há diferenças significativas no tocante ao modelo das Relações Humanas ($p < 0.05$).

Tabela 13 – Teste *t-Student* dos fatores da variável Clima Organizacional para os alunos dos 4.º ao 7.º anos na AFA

Modelo	Amostras	n	Média	Desvio Padrão	Significância
Relações Humanas	Internos	39	2.034	0.279	**0.016**
	Semi-internos	47	2.207	0.359	
Processos Internos	Internos	39	2.987	0.484	0.419
	Semi-internos	47	2.904	0.469	
Objetivos Racionais	Internos	39	2.615	0.385	0.417
	Semi-internos	47	2.631	0.349	

Notada a diferença de médias no modelo das Relações Humanas apenas entre os alunos internos e semi-internos dos 4.º ao 7.º anos na AFA, foi realizado um teste *Mann-Whitney* por forma a analisar as dimensões do modelo, concluindo-se que tal se deve às diferenças significativas quanto à autonomia ($p < 0.01$) e à participação ($p < 0.01$) (Tabela 14).

Tabela 14 – Teste *Mann-Whitney* das dimensões do modelo das Relações Humanas

Modelo	Amostras	n	Média	Desvio Padrão	Significância
Autonomia	Internos	39	1.419	0.380	**0.007**
	Semi-internos	47	1.695	0.476	
Integração	Internos	39	2.692	0.537	0.075
	Semi-internos	47	2.898	0.526	
Participação	Internos	39	1.628	0.337	**0.006**
	Semi-internos	47	1.879	0.463	
Apoio da Supervisão	Internos	39	1.985	0.559	0.786
	Semi-internos	47	2.064	0.670	
Formação	Internos	39	2.378	0.490	0.463
	Semi-internos	47	2.468	0.528	
Bem-estar	Internos	39	2.103	0.603	0.327
	Semi-internos	47	2.239	0.612	

A semelhança estatística de médias entre os 2.º e 3.º anos permitiu tratá-los como um grupo homogéneo durante a realização de um teste *t-Student* e concluir que não existem diferenças de médias significativas entre especialidades durante os anos em que a formação académica é feita integralmente na AFA (dos 1.º ao 3.º anos), porque não se observaram valores de $p < 0.05$.

Da análise feita às diferentes dimensões do Clima Organizacional, foi possível inferir que ao longo do percurso académico dos alunos CCMA entre os 1.º e 5.º anos há uma diminuição de médias transversal a todas as variáveis estudadas, exceto em relação às dimensões autonomia e tradição.

4.2.2. Diferenças de médias da variável Cultura Organizacional

Dada a diferença significativa entre as dimensões das subamostras compostas por alunos do CCMA e alunos ETM, foi utilizado o teste não paramétrico *Mann-Whitney* e registou-se como significativas as diferenças de médias relativas ao modelo de Cultura Hierárquica entre os alunos CCMA e ETM ($p < 0.05$) (Tabela 15).

Tabela 15 – Teste *Mann-Whitney* dos fatores da variável Cultura Organizacional

Modelo	Amostras	n	Média	Desvio Padrão	Significância
Clã	CCMA	233	3.348	0.851	0.710
	ETM	11	3.467	0.799	
Adocrática	CCMA	233	2.964	0.854	0.299
	ETM	11	3.212	0.699	
Hierárquica	CCMA	233	3.528	0.644	**0.028**
	ETM	11	3.964	0.528	
Mercado	CCMA	233	3.557	0.771	0.897
	ETM	11	3.591	0.664	

Nas Tabelas 16 a 19 apresentam-se os resultados dos testes *One-Way* ANOVA aplicados aos modelos de Cultura de Clã ($p < 0.001$), Adocrática ($p < 0.001$), Hierárquica ($p < 0.001$) e de Mercado ($p < 0.001$), de onde se percebe haverem diferenças significativas entre médias em todos os modelos. As significâncias de diferenças de médias entres anos estão realçadas nas Tabelas 20 a 23, que espelham os resultados dos testes *post-hoc* HSD *Tukey*, utilizados dada a homogeneidade das variâncias.

Tabela 16 – Teste *One-Way* ANOVA do modelo de Cultura de Clã

Modelo	Amostras	n	Média	Desvio Padrão	Significância
Clã	1.º ano	44	4.424	0.431	**0.000**
	2.º ano	73	3.338	0.656	
	3.º ano	30	3.161	0.816	
	4.º ano	33	2.808	0.708	
	5.º ano	23	2.913	0.570	
	6.º ano	19	2.702	0.647	
	7.º ano na AFA	11	3.273	0.716	
Total		233	3.348	0.851	

Tabela 17 – Teste *One-Way* ANOVA do modelo de Cultura Adocrática

Modelo	Amostras	n	Média	Desvio Padrão	Significância
Adocrática	1.º ano	44	4.034	0.595	**0.000**
	2.º ano	73	2.865	0.613	
	3.º ano	30	2.844	0.869	
	4.º ano	33	2.662	0.515	
	5.º ano	23	2.623	0.676	
	6.º ano	19	2.114	0.671	
	7.º ano na AFA	11	2.758	0.844	
Total		233	2.964	0.854	

Tabela 18 – Teste *One-Way* ANOVA do modelo de Cultura Hierárquica

Modelo	Amostras	n	Média	Desvio Padrão	Significância
Hierárquica	1.º ano	44	4.246	0.464	**0.000**
	2.º ano	73	3.485	0.566	
	3.º ano	30	3.427	0.492	
	4.º ano	33	3.236	0.556	
	5.º ano	23	3.130	0.469	
	6.º ano	19	3.263	0.718	
	7.º ano na AFA	11	3.382	0.414	
Total		233	3.528	0.644	

Tabela 19 – Teste *One-Way* ANOVA do modelo de Cultura de Mercado

Modelo	Amostras	n	Média	Desvio Padrão	Significância
Mercado	1.º ano	44	4.142	0.637	**0.000**
	2.º ano	73	3.545	0.699	
	3.º ano	30	3.625	0.694	
	4.º ano	33	3.356	0.753	
	5.º ano	23	3.294	0.714	
	6.º ano	19	2.947	0.775	
	7.º ano na AFA	11	3.318	0.742	
Total		233	3.557	0.771	

Da Tabela 20 retira-se que em relação à Cultura de Clã, há diferenças de médias entre: o 1.º ano e todos os outros alunos ($p < 0.01$); e entre o 2.º ano e os 4.º e 6.º anos ($p < 0.05$).

Tabela 20 – Teste *post-hoc* HSD *Tukey* do modelo de Cultura de Clã

Sig.	1.º ano	2.º ano	3.º ano	4.º ano	5.º ano	6.º ano	7.º ano na AFA
1.º ano	1						
2.º ano	**0.000**	1					
3.º ano	**0.000**	0.938	1				
4.º ano	**0.000**	**0.010**	0.537	1			
5.º ano	**0.000**	0.063	0.848	0.996	1		
6.º ano	**0.000**	**0.011**	0.324	0.998	0.921	1	
7.º ano na AFA	**0.004**	1.000	0.999	0.524	0.763	0.350	1

Da Tabela 21, conclui-se que em relação à Cultura Adocrática, há diferenças de médias entre: o 1.º ano e todos os outros alunos ($p < 0.01$); o 6.º ano e os 2.º ($p < 0.01$) e 3.º ($p < 0.05$) anos.

Tabela 21 – Teste *post-hoc* HSD *Tukey* do modelo de Cultura Adocrática

Sig.	1.º ano	2.º ano	3.º ano	4.º ano	5.º ano	6.º ano	7.º ano na AFA
1.º ano	1						
2.º ano	**0.000**	1					
3.º ano	**0.000**	1.000	1				
4.º ano	**0.000**	0.569	0.951	1			
5.º ano	**0.000**	0.726	0.941	1.000	1		
6.º ano	**0.000**	**0.003**	**0.029**	0.060	0.211	1	
7.º ano na AFA	**0.006**	0.999	1.000	1.000	0.999	0.362	1

Da análise da Tabela 22, o 1.º ano apresenta diferenças de médias de Cultura Hierárquica com todos os outros anos ($p < 0.001$).

Tabela 22 – Teste *post-hoc* HSD *Tukey* do modelo de Cultura Hierárquica

Sig.	1.º ano	2.º ano	3.º ano	4.º ano	5.º ano	6.º ano	7.º ano na AFA
1.º ano	1						
2.º ano	**0.000**	1					
3.º ano	**0.000**	0.998	1				
4.º ano	**0.000**	0.353	0.777	1			
5.º ano	**0.000**	0.062	0.299	0.987	1		
6.º ano	**0.000**	0.868	0.974	1.000	0.992	1	
7.º ano na AFA	**0.000**	0.988	1.000	0.965	0.693	0.997	1

Quanto à Cultura de Mercado, a Tabela 23 mostra diferenças de médias entre 1.º ano e todos os anos, exceto os que se encontram no 7.º ano na AFA ($p < 0.05$).

Tabela 23 – Teste *post-hoc* HSD *Tukey* do modelo de Cultura de Mercado

Sig.	1.º ano	2.º ano	3.º ano	4.º ano	5.º ano	6.º ano	7.º ano na AFA
1.º ano	1						
2.º ano	**0.000**	1					
3.º ano	**0.030**	0.998	1				
4.º ano	**0.000**	0.883	0.758	1			
5.º ano	**0.000**	0.755	0.622	1.000	1		
6.º ano	**0.000**	0.068	0.053	0.525	0.747	1	
7.º ano na AFA	0.053	0.956	0.887	1.000	1.000	0.846	1

As diferenças de médias dos fatores da variável Cultura Organizacional entre alunos internos e alunos semi-internos que frequentam IESP, ou seja, dos 4.º ao 7.º anos na AFA, foram determinadas pelo teste de amostras independentes *t-Student*. Como mostra a Tabela 24, há diferenças significativas no tocante ao modelo de Cultura Hierárquica ($p < 0.05$).

Tabela 24 – Teste *t-Student* dos fatores da variável Cultura Organizacional para os alunos dos 4.º ao 7.º anos na AFA

Modelo	Amostras	n	Média	Desvio Padrão	Significância
Clã	Internos	39	2.812	0.623	0.453
	Semi-internos	47	2.922	0.713	
Adocrática	Internos	39	2.483	0.614	0.456
	Semi-internos	47	2.592	0.720	
Hierárquica	Internos	39	3.067	0.482	**0.011**
	Semi-internos	47	3.370	0.579	
Mercado	Internos	39	3.192	0.804	0.562
	Semi-internos	47	3.287	0.709	

Relativamente aos 2.º e 3.º anos, não há diferenças de médias significativas entre alunos internos e semi-internos, por não se ter observado valores de $p < 0.05$. Porém, em relação ao 1.º ano (Tabela 25), notaram-se diferenças de médias significativas entre alunos internos e semi-internos nos modelos de Cultura Adocrática ($p < 0.05$) e de Mercado ($p < 0.05$).

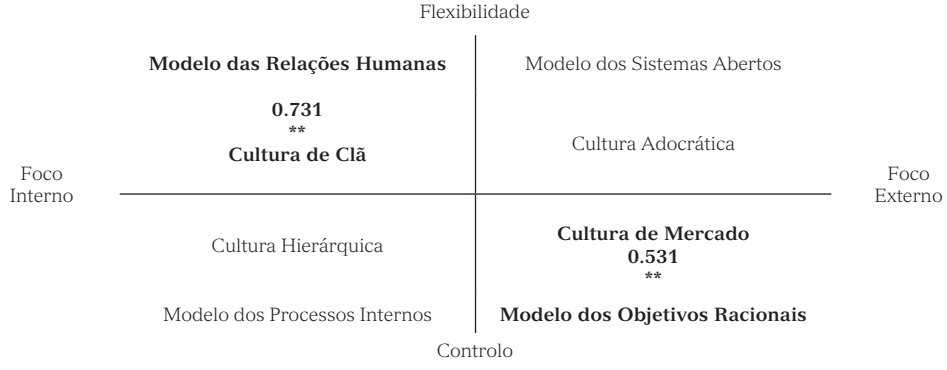
Tabela 25 – Teste *t-Student* dos fatores da variável Cultura Organizacional para os alunos do 1.º ano

Modelo	Amostras	n	Média	Desvio Padrão	Significância
Clã	Internos	17	4.363	0.097	0.459
	Semi-internos	27	4.463	0.087	
Adocrática	Internos	17	3.794	0.159	**0.032**
	Semi-internos	27	4.185	0.098	
Hierárquica	Internos	17	4.106	0.107	0.115
	Semi-internos	27	4.333	0.089	
Mercado	Internos	17	3.868	0.193	**0.021**
	Semi-internos	27	4.315	0.086	

Foram aplicados testes *One-Way* ANOVA com o objetivo de aferir diferenças de médias entre especialidades dos anos correspondentes à graduação em cadete-aluno, para cada modelo de Clima Organizacional e Cultura Organizacional. Tendo-se verificado que para cada ano estudado não existem diferenças de médias significativas entre especialidades ($p > 0.05$).

4.3. Correlações entre modelos das variáveis

Da análise da Figura 7 apresentam-se as correlações fortes e estatisticamente significativas encontradas, em concreto, entre o modelo das Relações Humanas e a Cultura de Clã ($\rho = 0.731$); e entre modelo dos Objetivos Racionais e a Cultura de Mercado ($\rho = 0.531$). Adicionalmente, conclui-se ainda a existência de correlação forte e significativa entre o Clima Organizacional e a Cultura Organizacional ($\rho = 0.752$).



* correlação significativa p < 0.05; ** correlação é significativa ao nível inferior a 0.01 (2 extremidades).

Figura 7 – Correlações de *Pearson* entre modelos de Clima Organizacional e modelos de Cultura Organizacional

Da análise da Figura 8[12], que apresenta os perfis de Clima Organizacional e Cultura Organizacional correspondentes à média dos quadrantes do modelo dos valores contrastantes de todos os alunos da AFA, conclui-se que os modelos de Processos Internos e Objetivos Racionais e os tipos de cultura que lhes correspondem (Cultura Hierárquica e Cultura de Mercado) apresentam as maiores médias.

Figura 8 – Modelo dos Valores Contrastantes de Clima e Cultura Organizacionais

[11] O modelo de Cultura Organizacional foi redimensionado para uma escala de 1 a 4.

5. Discussão dos resultados

A evidência empírica encontrada permite confirmar as cinco hipóteses colocadas, três de forma "completa" (H3 a H5) e duas de forma parcial (H1 e H2), conforme seguidamente detalhado.

Teste da *H1*: *Existem diferenças de Clima Organizacional entre os alunos do CCMA e do ETM.*

A confirmação parcial da H1, deve-se ao facto de apenas terem sido encontradas diferenças significativas entre os alunos do CCMA (com exceção do 1.º ano) e os alunos do ETM relativamente ao modelo das Relações Humanas. A perceção de elevado apoio sentida pelo ETM, similarmente aos do 1.º ano, poderá justificar-se pelo facto de, à data da resposta ao questionário, o seu ingresso na AFA ser ainda recente, o que se traduz numa ainda precoce fase de aprendizagem da forma (apropriada) de ser, de estar e de pensar por parte do novo membro da organização (Rousseau, 1990; Schein, 1990), que, assim sendo, requer mais apoio por parte de quem está na organização há mais tempo (Schein, 2010). Para tal, a chefia assume um papel preponderante porque: a liderança é um dos principais antecedentes do clima (Ehrhart & Schneider, 2016, p. 5), os líderes têm de fornecer direção e propósito (Martin & McCausland, 2002, p. 429, cit. por Pierce, 2010); e os líderes, ao ajudarem os liderados, assumem a função de líder cuidador, que se enquadra com o modelo das Relações Humanas (Cameron et al., 2006, p. 79). Ademais, e tal como evidenciado por González-Romá e Gamero (2012, p. 98), há uma correlação positiva entre o clima de apoio e o desempenho.

Teste da *H2*: *Existem diferenças de Cultura Organizacional entre os alunos do CCMA e do ETM.*

A confirmação parcial da H2, prende-se com o facto de apenas se terem registado diferenças significativas de médias na Cultura Hierárquica, com o ETM a apresentar valores superiores ao CCMA. Apesar de Lopes et al. (2018) terem encontrado médias de Cultura Hierárquica do ETM ligeiramente inferiores às do CCMA, tal não permite argumentar que seria expectável que os resultados atuais fossem semelhantes, uma vez que o grupo de indivíduos que compõe o ETM nos dois estudos é diferente e diferentes grupos podem desenvolver subculturas diferentes, mais fortes ou fracas que outras (Ehrhart & Schneider, 2016, p. 10). Porém, os resultados coincidem com os de Breslin (2000, p. 16), que encontrou maiores médias de perceção de cultura de disciplina, autoridade e uniformização – características da Cultura Hierárquica (Cameron & Quinn, 2011) – em militares de maior graduação na categoria de oficiais.

Teste da *H3*: *Existem diferenças de Clima Organizacional entre os alunos dos diferentes anos do CCMA.*

A confirmação da H3, associa-se à presença de médias significativamente diferentes entre o 1.º ano e os restantes anos do CCMA em relação aos modelos das Relações Humanas (cfr. já acima discutido no estudo da H1) e dos Objetivos Racionais. Centrando, então, a discussão neste segundo modelo, esta ocorrência associa-se, muito possivelmente, ao facto do 1.º ano, por estar numa fase inicial, ser o que mais recebe *feedback* do seu desempenho por parte das

chefias, o que se reflete, entre outras situações, numa melhor perceção da qualidade do trabalho e do esforço realizado. O 1.º ano evidência médias superiores às médias dos alunos CCMA em todas as dimensões estudadas, exceto a dimensão tradição, que é significativamente inferior à média dos alunos CCMA mais antigos. Uma "inferioridade" eventualmente associada ao facto de ainda não terem tido o tempo e o número de experiências organizacionais suficientes que lhes permita a conhecer a forma como as coisas são feitas na organização (Schein, 2010).

Adicionalmente, o facto de o 1.º ano apresentar valores elevados em todos os quadrantes de clima que foram estudados, é algo que ecoa o já antes constatado por Lopes et al. (2018), e que está igualmente alinhado com o predito por Schneider (2000) de que o clima causa cultura. Isto é, que os climas específicos que são desenvolvidos, correspondem a manifestações dos valores das culturas que lhes servem de base (Beus et al., 2020, p. 1). Diferenças significativas de médias foram igualmente notadas entre o 2.º ano e os 4.º, 5.º e 6.º anos, traduzidas na maior perceção de esforço e qualidade por parte do 2.º ano. Uma situação possivelmente associada à proximidade temporal com a sua fase de enquadramento militar, caracterizada pelo elevado grau de exigência e intensidade da formação, que, segundo Saltzman et al. (2013, cit. por Redmond et al., 2015, p. 9), requer resiliência (esforço). Por outro lado, os alunos semi--internos que estudam em IESP demonstram valores médios superiores aos alunos PILAV dos mesmos anos, no tocante ao modelo das Relações Humanas, o que, da análise realizada às dimensões, poderá associar-se ao facto dos alunos semi-internos, dos 4.º ao 7.º anos na AFA, experienciarem uma maior perceção de autonomia e de participação. Duas características frequentemente associadas ao "contexto" de universidade civil (Feng, 2018, p. 34; Sokol et al., 2015, p. 285).

Teste da *H4*: *Existem diferenças de Cultura Organizacional entre os alunos dos diferentes anos do CCMA*.

A confirmação da H4, justifica-se pela clara diferença apresentada pelo 1.º ano em relação a todos os modelos de Cultura Organizacional comparativamente com os restantes anos do CCMA, ao apresentar valores substancialmente elevados. Não obstante a cada ano corresponder uma subcultura, que pode tomar uma versão intensificada da Cultura Organizacional (Martin & Siehl, 1983), a tendência do 1.º ano para apresentar transversalmente maiores médias do que os restantes alunos e a propensão do seu decréscimo e estabilização ao longo dos anos seguintes, já fora notada pelo estudo de Lopes et al. (2018). Um gradiente temporal de modificação cultural muito possivelmente associado ao observado por Schein (2000, p. xxv), relativamente ao facto de poderem haver subgrupos dentro da organização que mostram diferenças numa dada cultura, por não terem tido ainda suficientes experiências partilhadas que levam à adoção de pressupostos comuns.

Para além das diferenças entre o 1.º ano e os restantes, observaram-se igualmente diferenças para a Cultura de Clã entre o 2.º ano e os 4.º e 6.º anos, estes últimos com valores mais baixos. Um valor elevado que, por um lado e como expectável, é inferior ao do 1.º, mas que, por outro lado, é compreensível que seja superior ao de alunos mais antigos visto o 2.º ano estar no início da curva de decréscimo já notada por Lopes et al. (2018) e pelo presente estudo. No entanto, dada a circunstância formativa em que os alunos do 2.º ano se encontravam à data do inquérito,

com o prolongamento da sua fase de aculturação mais intensa a abranger parte do seu segundo ano de curso – p.ex., em matéria "exposição" ainda muito contínua, no tempo, a situações propícias ao desenvolvimento de características militares enquadráveis no modelo de Cultura de Clã, como sejam o sentido de comunidade (espírito de corpo), o desenvolvimento da coesão, a vontade de cooperar (camaradagem) e a formação de parcerias duradouras (Cameron et al., 2006) –, tal poderá ser suficientemente forte para o 2.º ano apresentar valores mais aproximados aos do 1.º ano. Por outro lado ainda, o contacto muito próximo que o atual 2.º ano teve com o atual 5.º ano ao longo do ano anterior ao presente estudo –, repercutido, p.ex., num maior número de vivências partilhadas e assimilação de indícios culturais (Denisson, 1996) entre estes, à data, 2.º e 5.º anos, – poderá ser uma das razões para os 4.º e 6.º anos apresentarem diferenças de Cultura de Clã com o 2.º ano, mas o 5.º ano não.

Relativamente à Cultura Adocrática, observaram-se diferenças significativas entre o 1.º ano e os restantes anos, tendo, no entanto, o 6.º ano apresentado médias inferiores às dos 2.º e 3.º anos, consubstanciando-se numa subcultura de carácter adocrático mais fraca (Ehrhart & Schneider, 2016; Schein, 2016). A constatação de não existirem médias significativamente elevadas neste tipo de cultura em nenhum ano do CCMA, com exceção do 1.º ano, é desejável, porque sinónimo da inexistência de disparidade entre subculturas numa vertente que não seja estratégica para a organização (Cameron et al., 2006, p. 120), e de um maior comprometimento organizacional e consequente aumento na produtividade (Beus et al., 2019, cit. por Beus et al., 2020).

No tocante à Cultura Hierárquica, as diferenças observadas foram entre o 1.º ano e os restantes anos do CCMA, com os primeiros a demonstrarem maiores médias. Uma situação expectável porque estes alunos, encontrando-se ainda numa fase muito embrionária da sua adaptação à AFA, são confrontados, de forma exaustiva, com uma cultura militar muito baseada na estrutura, no modelo de trabalho e nas regras (Redmont et al., 2015, p. 9), que são, no fundo, um conjunto de características associadas à Cultura Hierárquica (Cameron & Quinn, 2011; Quinn & Rohrbaugh, 1983). Adicionalmente, as elevadas médias desta cultura no seu todo (i.e., de forma transversal à generalidade dos anos, por comparação com os outros tipos de cultura), estão muito possivelmente associadas ao facto dos alunos perceberem a organização como um estabelecimento castrense de ensino superior eficaz porque estável, previsível e mecânico (Cameron & Quinn, 2011, p. 38).

No tocante à Cultura de Mercado, foram apenas encontradas diferenças entre o 1.º ano e os restantes. Esta cultura mostrou-se tão vincada como a Cultura Hierárquica (em teoria, e também aqui, a cultura dominante neste tipo de organização), o que, à luz de Cameron e Quinn (2011), é uma evidência com importante significado, porque aporta o facto da AFA, para além de ter os traços culturais identitários de uma organização militar, tem, igualmente, traços culturais de uma cultura orientada para a tarefa, a exigência e para a ênfase em ganhar.

A presença de médias inferiores nos quadrantes com foco externo demonstrada pelos alunos PILAV do 1.º ano, em comparação com os demais alunos de diferentes especialidades, afigura-se como "paradoxal" porque *difere* e ao mesmo tempo *ecoa* o referido por Schein (2016, p. 25), ao advogar valores de cultura semelhantes em indivíduos que foram treinados

da mesma forma, com os mesmos valores e com uma socialização forte durante o período de formação. *Difere* porque o tratamento e a formação ministrados ao 1.º ano, sobretudo nos primeiros meses de integração na AFA, são muito uniformes. *Ecoa* porque, fruto da especialidade PILAV, estes alunos têm algumas horas/semana de instrução em pilotagem, possivelmente muito impactante e potencialmente indutora desta diferença.

Teste da *H5*: *Existe relação entre o Clima Organizacional e a Cultura Organizacional da AFA*.

A confirmação da H5, está associada às correlações significativas entre as dimensões dos modelos de Clima Organizacional, propostos por Patterson et al. (2004), e os modelos de Cultura Organizacional, propostos por Cameron e Quinn (1999), e entre estas duas variáveis no seu todo. Um conjunto de evidências que vão ao encontro da teoria por: estarem alinhadas com a reflexão de Schneider (2000), de que o clima associa-se, para além de ser causa, à cultura; os conceitos de clima e cultura serem conceptualmente semelhantes (Beus et al., 2020); o clima ser a manifestação superficial da cultura (Parker at al., 2003); para além dos estudos quantitativos de cultura aferirem valores organizacionais diretamente, os estudos de clima aferem perceções de características organizacionais que são a própria manifestação desses mesmos valores (Schneider et al., 2011).

6. Conclusões

O estudo foi norteado pela questão de investigação: *Como é que se caracteriza o Clima Organizacional e a Cultura Organizacional na Academia da Força Aérea?*, operacionalizada com recurso a um modelo teórico (modelo dos valores contrastantes) que permitiu tipificar três tipos de Clima Organizacional (Relações Humanas, Processos Internos e Objetivos Racionais) e quatro formas de Cultura Organizacional (Clã, Adocrática, Hierárquica e de Mercado), com a apresentação de um inquérito por questionário composto por uma escala de Clima Organizacional (OCM) e uma escala de Cultura Organizacional (OCAI).

Dos dados obtidos, **concluiu-se**, numa análise mais micro (por ano/por curso) que os alunos ETM demostram diferenças significativas em relação aos alunos CCMA (excetuando o 1.º ano) no tocante aos modelos de Relações Humanas e Cultura Hierárquica. Da análise intraCCMA salientam-se vários aspetos. O 1.º ano apresenta maiores médias em todos os modelos de Clima e Cultura Organizacionais, excetuando-se o modelo dos Processos Internos, devido à baixa perceção de tradição. Existe, de forma genérica, uma tendência de decréscimo de médias dos modelos ao longo dos anos de curso. Observou-se, por outro lado, uma relativa homogeneidade de perceções de Clima Organizacional e Cultura Organizacional entre o 2.º e os do 7.º ano na AFA, tendo apenas sido notadas diferenças significativas quanto ao clima entre o 2.º ano e os alunos dos 4.º, 5.º e 6.º anos no modelo dos Objetivos Racionais; e , quanto à cultura, entre o 2.º ano e os 4.º e 6.º anos, pelos primeiros revelarem uma Cultura de Clã mais vincada, e entre o 6.º ano e os 2.º e 3.º anos, pelos primeiros expressarem com menor intensidade a Cultura Adocrática. Analisando por especialidades, concluiu-se que os alunos semi-internos que estudam em IESP apresentam valores superiores nos modelos

de Relações Humanas e Cultura Hierárquica; e, no 1.º ano, os alunos PILAV exprimem uma menor identificação com os modelos culturais de foco externo (Cultura Adocrática e Cultura de Mercado), comparativamente aos restantes.

Numa análise mais macro, os dados recolhidos, e acima sumariados, vão no sentido de, não obstante a amostra de alunos poder subdividir-se (por uma questão de homogeneidade de valores médios) em três grupos (1.º ano, alunos do 2.º ao 7.º anos na AFA, e ETM), os perfis globais de Clima e Cultura Organizacionais apresentarem uma "geometria" semelhante entre si, com uma predominância do controlo e estratificação da organização. Tal caracterização deve-se à perceção por parte dos alunos de que os modelos de Processos Internos e Objetivos Racionais são os que melhor descrevem o Clima Organizacional por eles experienciado, e as tipologias culturais que lhes correspondem (Cultura Hierárquica e Cultura de Mercado) as que melhor caracterizam a cultura da organização a que pertencem.

Neste seguimento, a AFA apresentou-se/apresenta-se retratada como uma Instituição: por um lado, pautada pela formalidade, estruturação e pela formalização de procedimentos e regras, com a utilização da gestão e comunicação como formas de atingir um estado de estabilidade e controlo que potenciam a sua eficiência, consistência e uniformização; e, por outro, orientada para a obtenção de melhores resultados e para a execução, com qualidade, dos seus objetivos, fruto de uma liderança exigente, que avalia e dá aos alunos, *feedback* – percebido como pertinente e *on time* – sobre o seu desempenho e esforço. Tendo, desta forma, para além dos traços culturais identitários de uma organização militar, traços culturais orientados para a tarefa, a exigência e para a ênfase em ganhar.

O **contributo teórico** da presente dissertação traduz-se na evidência empírica encontrada relativamente à robustez da adoção do modelo dos valores contrastantes (o modelo mais utilizado nos estudos quantitativos de Cultura Organizacional), como modelo agregador de climas específicos em submodelos/quadrantes decorrentes de tipologias de Cultura Organizacional.

Relativo ao **contributo prático**, a presente dissertação mune os decisores da AFA, pela primeira vez, com uma medição das perceções dos alunos sobre o Clima Organizacional e com uma quantificação atualizada da Cultura Organizacional, conceitos preponderantes no estudo das organizações por terem impacto em inúmeros resultados (*outcomes*), tais como satisfação no trabalho (Johnson & McIntye, 1998, p. 848), inovação e eficácia (Glisson, 2015, p. 247), segurança (West et al., 2014 , p. 339), bem estar no ambiente escolar (Lombardi et al., 2019, p. 7), comprometimento organizacional (Grant, 2002, p. 139), entre outros.

A principal **limitação** desta investigação – que lhe foi, contudo, alheia e não se constituiu como condicionante das mais-valias das evidenciais encontradas, ainda para mais porque ancoradas num desenho de pesquisa quase-longitudinal –, prende-se com o facto de não ter sido possível fazer um estudo longitudinal de pelo menos dois anos, conforme sugerido por vários autores que estudaram quer o Clima Organizacional quer a Cultura Organizacional (Ashkanasy, Broadfoot & Falkus, 2000; González-Romá & Gamero, 2012; Wilderom et al., 2000).

Concernente a **estudos futuros**, e diretamente decorrente do acima referido, afigura-se importante efetuar um estudo longitudinal que permita perceber mudanças no perfil do

modelo de valores contrastantes na AFA ao longo do tempo e relacioná-las com a lógica de planeamento e decisão, lógica esta que, segundo Bacharach e Mundel (1993, cit. por Paparone, 2003) tende a mudar com a vinda de novos elementos com diferentes formas de pensar para a organização. Igualmente pertinente, afigura-se o desenvolvimento de um estudo da Cultura e do Clima Organizacionais nas diferentes áreas funcionais da AFA e da FA, atendendo ao notado por Paparone (2003, p. 121) numa universidade militar do Departamento de Defesa dos EUA, designadamente o facto dos departamentos de ensino, investigação e chefia apresentarem culturas dominantes distintas, e por Erhardt (2018), que encontrou diferenças no perfil cultural interdepartamentos da *US Air Force*. Um último estudo percebido como pertinente, passa pelo alargamento/réplica da presente investigação aos estabelecimentos de ensino superior público militar de congéneres nacionais, por forma a avaliar eventuais tendências e estabelecer potenciais paralelismos entre o clima e a cultura vivenciados pelos futuros oficiais das FFAA, dado o já suprarreferido impacto destas variáveis em diversos *outcomes*.

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ORGANIZATIONAL CLIMATE AND ORGANIZATIONAL CULTURE IN THE AIR FORCE ACADEMY[1]

CLIMA ORGANIZACIONAL E CULTURA ORGANIZACIONAL NA ACADEMIA DA FORÇA AÉREA

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Abstract

Studying variables of interest for decision-makers in organizations, such as climate and culture, increases their ability to understand and optimise situations that influence organizational outcomes. Therefore, this study aimed to analyse the organizational climate and culture to which the students of the Military Aeronautical Sciences Course

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[1] Article adapted from the Master's dissertation carried out for the Master's degree in Military Aeronautics. The defence took place in July 2022 at the Air Force Academy. The full version of the paper is available from Portugal's Open Access Scientific Repositories (RCAAP).

(CCMA)[2] and of the Military Technical Training Programme (ETM) of the Air Force Academy (AFA) are exposed, to identify differences between them and identify dominant "typologies". To that end, a survey sample of 244 students (90% of the population) was analysed using the *Organizational Climate Measure* (OCM) and the *Organizational Culture* Assessment Instrument (OCAI). The findings revealed significant differences between CCMA and ETM students in the human relations and hierarchy culture models, and between students enrolled in the 1st year of the CCMA and students enrolled in other years of the course in practically all analysed the models (except for the internal process model). Furthermore, aside from 1st year students, the internal process and market culture models were the only models where no differences were found. The data also showed that the dominant climates and cultures are the internal process model (hierarchy culture) and the rational goal model (market culture).

Keywords: Organizational Climate; Organizational Culture; Competing Values Framework.

Resumo

Analisar variáveis de interesse para os decisores organizacionais, como sejam o clima e a cultura, traduz-se em maior capacidade de compreensão e otimização de situações que impactam sobre os resultados organizacionais. Esta investigação teve, então, por objetivo estudar o clima e cultura organizacionais dos alunos do Curso em Ciências Militares Aeronáuticas (CCMA)[3] e do Estágio Técnico Militar (ETM) ministrados pela Academia da Força Aérea (AFA), por forma a averiguar a existência de diferenças e a identificar "tipologias" dominantes. Para tal, foi analisada uma amostra de 244 alunos (90% da população), com recurso aos instrumentos Organizational Climate Measure (OCM) e Organizational Culture Assessment Instrument (OCAI). Dos resultados obtidos, concluiu-se que existem diferenças significativas entre o CCMA e o ETM nos modelos de relações humanas e de cultura hierárquica, e entre o 1.º ano e os restantes anos do CCMA em praticamente todos os modelos estudados (excetuando o dos processos internos). Concluiu-se, igualmente, que, à parte do 1.º ano, apenas não existem diferenças em relação aos modelos de processos internos e cultura de mercado. As evidências encontradas permitiram, ainda, constatar que o clima e a cultura dominantes caracterizam-se pelos modelos de processos internos (cultura hierárquica) e objetivos racionais (cultura de mercado).

***Palavras-chave**: Clima Organizacional; Cultura Organizacional; Modelo dos Valores Contrastantes.*

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[2] The designations used here are specified in Notice No. 5817/2022 of 21 March, which replaces the Master's degree in Military Aeronautics (CCMA).

[3] A notação utilizada é a presente no Aviso n.º 5817/2022, de 21 de março, e que substitui a anterior Curso de Mestrado em Aeronáutica Militar (CCMA).

1. Introduction

Human behaviour is not only determined by personal characteristics and other variables, but is also shaped by the environment in which people interact in the workplace, as well as by multiple organizational characteristics (Berberoglu, 2018), such as Organizational Climate and Organizational Culture.

Even though Organizational Climate and Organizational Culture are different concepts (which at times overlap), they have two aspects in common: they explain similar psychological phenomena and they are useful when combined, both from a conceptual and a practical perspective, to ascertain how employees experience their work environment as a whole (Schneider & Barbera, 2014).

Studies on Organizational Climate have shown that work environment has a significant impact on employees' attitudes towards the organization (Berberoglu, 2018; Schneider & Barbera, 2014), particularly regarding their sense of belonging, interpersonal relationships and job performance (Mullins, 2010).

On the other hand, Organizational Culture has been studied since the seventies and eighties of the 20th century, stems from the fields of anthropology and sociology, and focuses on characterising groups and identifying differences, particularly in terms of their intrinsic values (Schneider & Barbera, 2014). This approach has proved useful inasmuch as it provides (Cunliffe, 2008): insight on how employees and the external environment view the organization; a course of action and a defined mission, vision and values; a way to influence the organization's performance; methods of attractting and retaining motivated employees because "strong cultures" that employees agree with and assimilate are precisely the ones that can significantly influence their behaviour and commitment.

This study on *Organizational Climate and Culture in the Air Force Academy* is relevant because it will provide:

– Theoretical knowledge on the Organizational Climate and Organizational Culture constructs, which are key concepts for organizational science as indicators of organizational behaviour;

– Practical knowledge that can be used by the organization's decision-makers – in this case, the Air Force Academy (AFA) – should they decide to (re)consider and / or (re)define some aspects of the organization's policies.

Furthermore, the study will innovate, on the one hand, by analysing for the first time the AFA's Organizational Climate, and, on the other, by "revisiting" a study conducted in 2018 by Lopes, Fachada and Farinha on the Organizational Culture of this Military Higher Education Establishment [Estabelecimento de Ensino Superior Público Universitário Militar] (EESPUM)[4], making it a quasi longitudinal study (Saunders et al., 2009, p. 155). Furthermore, the study will provide a combined analysis of two variables which are considered essential to describe and analyse organizations (Machado & Davim, 2018).

[4] The designation used here is specified in Decree-Law 249/2015 of 28 October.

This study addresses the Organizational Climate and Organizational Culture of the AFA and has the following delimitations (Santos & Lima, 2019):

– Temporal: the study focuses on the present (23 December 2021, the deadline for answering the questionnaires, with the exception of 21 March, the date of Notice No. 5817/2022, which introduces the new CCMA nomenclature);

– Spatial: the study analyses the CCMA and ETM students in the AFA;

– Content: the study focuses on Organizational Climate and Organizational Culture.

The study will answer the following research question:

What are the characteristics of the Organizational Climate and Organizational Culture of the Air Force Academy?

The general objective, To examine the *Organizational Climate and Organizational Culture experienced by AFA students*, was achieved by accomplishing the following specific objectives: to identify differences in perceptions of Organizational Climate and Organizational Culture between the different types of training provided at the AFA and, in the CCMA, between different years and specialties; to assess the relationship between Organizational Climate and Organizational Culture; and to identify the predominant types of Organizational Climate and Organizational Culture in the AFA.

2. Theoretical framework

This chapter will describe the key concepts addressed in the study, that is, (organizational) Climate and Culture. It will be followed by a brief comparative analysis of both concepts and a list of hypotheses that will be tested in the study.

2.1. Organizational Climate

The definition of Organizational Climate has multiple interpretations in the literature – Verbeke et al. (1998) found 32 different meanings. Some interpretations refer to it as a "result" of perception. Specifically, Schneider and Reichers (1983), defined it as the set of shared perceptions regarding the policies, practices and procedures that an organization expects, supports and rewards, which makes it a "phenomenon" of perception rather than an objective characteristic of organizations, and Caetano et al. (2020, p. 325) operationalised it as the "set of perceived characteristics of an organizational unit, which are induced by [its] way of operating [...] and influence employee behaviour, which depends both on individual personality and on the perceptions people have of their environment".

Organizational Climate is relatively long-lasting and (Moran & Volkwein, 1992): reflects the collective perceptions of the members of an organization about how the organization deals with dimensions such as autonomy, trust, cohesion, support, recognition, innovation and justice; is produced by the interaction of the organization's members; provides a basis for the interpretation of any situation within the organization; reflects accepted values; and influences behaviour.

According to Schneider (1975), the literature on Organizational Climate can focus on:

– global climate, which means studying the work environment from a global perspective

(Kuenzi & Schminke, 2009) and quantifying all situational variables to predict all effects on the organizational environment, both in groups and employees (Litwin & Stringer, 1968);

– specific climates that illustrate specific aspects of the organization (Schneider, 1975).

This specialisation in the study of organizational climates led to a fragmentation in the literature on Organizational Climate because climates became "compartmentalised", and there was no longer an Organizational Climate, but several specific ones (Kuenzi & Schminke, 2009).

Today, studies on climate usually analyse the effects of specific climates on organizations, groups and / or employees (Caetano et al., 2020).

2.2. Organizational Culture

Conceptually, Powell et al. (2021) identified 54 definitions of Organizational Culture in the literature, including the one proposed by Schneider et al. (2017), who defined it as the shared values and basic assumptions that explain why organizations do what they do and focus on what they focus on, as well as definitions that describe it as a set of artefacts, values and assumptions that emerge from the interaction between the members of an organization (Keyton, 2011), are created locally by individuals, and can have specific effects on people (Parker, 2000).

For Parker (2000), culture and organization are isomorphic, inseparable concepts that enrich each other because organizations do not have a culture, they are a culture (Smircich, 1983).

Other authors, such as Schein (2016), argue that culture can be analysed in three levels that correspond to different degrees of abstractness:

– *Artefacts*, which correspond to everything that can be observed, heard or felt in the organization. This level that is easy to observe but difficult to decipher because an external observer can describe what he or she sees, but cannot (based on a single observation) reconstruct the meaning that such acts have for the members of the group.

– *Values and Beliefs*, which correspond to the process in which a group faced with a new challenge finds a shared solution (which is collectively perceived as good and appropriate, and is, therefore, socially validated) that gradually becomes a value or a belief, and finally a shared assumption that becomes a roadmap for dealing with the uncertainty of uncontrollable or difficult events, which in turn reduces uncertainty in critical areas of the group's functioning.

– *Basic assumptions,* which correspond to or result from the repeated and successful application of a shared solution. This shared solution then becomes internalised by the group as the correct course of action in similar situations, and there is little tolerance for different or opposite ways of dealing with the problem.

2.3. Climate versus Culture

As for their origin and evolution, these concepts have evolved since they first became a topic of study (James et al., 2008), as did the fields of knowledge in which they emerged (Schneider, 2000): culture as a concept came from the field of anthropology and climate from psychology (Kuenzi & Schminke, 2009).

Moreover, culture focuses on dimensions that are deeply rooted in the organization whereas climate refers to dimensions that are both different and more superficial, which

means that there is a clear distinction in their level of abstraction, as culture is a more abstract concept than climate (Kuenzi & Schminke, 2009).

The two concepts also differ in terms of mutability: culture tends to be more stable than climate, which is relatively temporary (Denison, 1996).

Furthermore, Falcione and Kaplan (1985) argue that, while climate focuses on the present and is an indicator of how well people adjust to the culture of an organization, Organizational Culture includes the history of the organization.

For Schein (2010), unlike climate, which is observable because it is perceived as "the feeling that is conveyed in a group by the physical layout" and the way members of an organization interact with outsiders, culture is abstract.

However, the two constructs are not incompatible, but complementary. Because it grows naturally from Organizational Culture, Organizational Climate is the most visible expression of that culture. In other words, Organizational Culture is expressed by Organizational Climate (Saraiva & Almeida, 2017).

2.4. Competing Values Framework

2.4.1. From organizational effectiveness to the Competing Values Framework

The discussion that led to the development of the competing values framework emerged from the concept of organizational effectiveness, analysed according to three dimensions (focus, structure and time horizons) (Quinn & Rohrbaugh, 1981).

The first dimension (x axis) is *Focus*, which can be (Quinn & Rohrbaugh, 1981, 1983):

– Internal, when it refers to the well-being and development of the members of the organization, and the organization is viewed as a social system in which participants have feelings and preferences that must be taken into account, and who require appropriate information and stability;

– External, when it addresses the well-being and development of the organization, which is a tool whose ultimate goal is to complete its tasks and acquire resources, with an emphasis on competitiveness.

The second dimension (y axis) refers to the structure of the organization, which can emphasise either control (on authority, structure, coordination and stability) or *flexibility* (diversity, change, individual initiative and organizational adaptability) (Quinn & Rohrbaugh, 1981, 1983).

The third dimension (z axis or depth axis) opposes *means and ends*, that is, important processes such as planning and goal setting, and goals such as achieving results and productivity (Quinn & Rohrbaugh, 1981, 1983).

When these dimensions are combined, four quadrants emerge (Quinn, 1988; Quinn & Rohrbaugh, 1983) which correspond to the following models:

– The Human Relations Model is defined by a flexible structure, a focus on people and concepts such as cohesion and morale (means) and human resource development (ends);

– The Internal Process Model is defined by a rigid structure, a focus on people and concepts such as information management and communication (means) and stability and control (ends);

– The Open Systems Model is defined by a flexible structure, a focus on the organization and concepts such as flexibility and readiness (means) and growth and resource acquisition (ends);

– The Rational Goal Model is defined by a rigid structure, a focus on the organization and concepts such as planning and goal setting (means) and productivity and efficiency (ends).

From an organizational perspective, the competing values framework is a way of describing the simple structures that underpin all organizational activities and the dimensions revealed by the study of organizational effectiveness can be applied to various aspects of the organization (Cameron et al., 2006; Hartnell et al., 2011), including climate (Patterson et al., 2004; Beus et al., 2020) and culture (Cameron et al., 2006; Cameron & Quinn, 2011; Hartnell et al., 2011).

2.4.2. The Competing Values Framework applied to Organizational Climate

Given that the study of Organizational Climate has branched into two main approaches (Schneider & Barbera, 2014), and bearing in mind that both have advantages, Patterson et al. (2004) argue that global climate and specific climate are opposite sides of the same coin, and use Quinn and Rohrbaugh's (1983) competing values framework to describe Organizational Climate because there is no model for Organizational Climate, and no consensus on the variable's dimensions.

Patterson et al. (2004) proposed 17 dimensions (innovation and flexibility are part of the same dimension), organized in a structure based on the competing values framework (Figure 1):

– Autonomy, or the extent to which employees' roles are defined in a way that gives them the freedom to do their job;

– Integration, or the trust and cooperation between departments;

– Participation, or the quantifiable influence that employees have on decision making, predictability and efficiency;

– Supervisory support, or the extent of the support and understanding supervisors provide employees;

– Training, or the organization's concern with developing the skills of its employees;

– Formalization, or the concern with formal rules and procedures;

– Tradition, or the the extent to which the established ways of operating are valued;

– Reflexivity, or the concern with reviewing and reflecting on objectives, strategies and processes;

– Innovation and Flexibility, or the support and encouragement with which innovative ideas / approaches are met and the organization's orientation toward change;

– Outward focus, or the organization's responsiveness to market needs;

– Clarity of organizational goals, or the concern for setting clear goals for the organization;

– Pressure to produce, or the pressure employees experience to meet targets;

– Quality, or the emphasis given to quality procedures;

– Performance feedback, or the measurement and feedback of job performance;

– Efficiency, or the importance placed on efficiency and productivity;

– Effort, or how hard employees work to achieve goals.

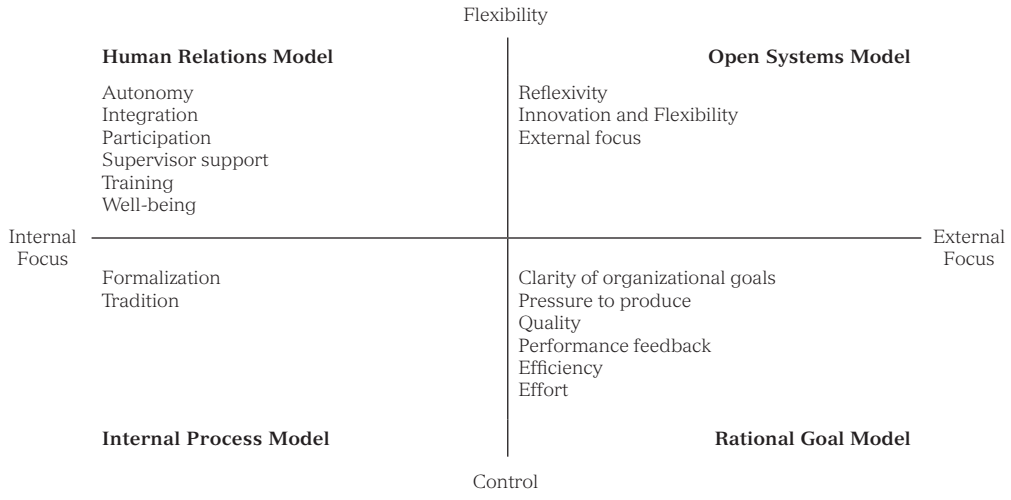

Figure 1 – Competing Values Framework applied to Organizational Climate
Source: Prepared from Patterson et al. (2004).

2.4.3. Competing Values Framework applied to Organizational Culture

When applied to the study of Organizational Culture, the competing values framework integrates and organizes many of the dimensions proposed in the literature (Cameron & Quinn, 2011).

It does this by combining the two axes to create four quadrants (Cameron & Quinn, 2011; Hartnell et al., 2011; Ployhart et al., 2014), with each quadrant corresponding to a specific type of culture (Cameron et al, 2006; Cameron & Quinn, 2011) (Figure 2).

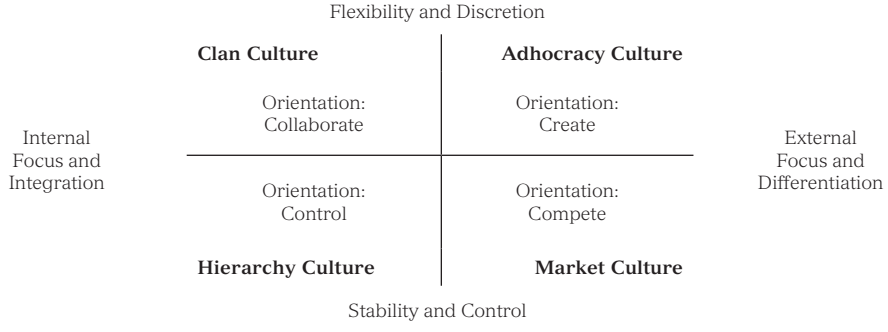

Figure 2 – Competing Values Framework applied to Organizational Culture
Source: Adapted from Cameron and Quinn (2011, p. 53).

The four types of culture that emerge (Figure 2) correspond, specifically, to (Cameron & Quinn, 2006; Caseiro, 2012):

– Clan Culture, which is characterised by the organization functioning as a large family where employees share a lot about themselves. Commitment is high, cohesion and morale are important, and the elements that foster group cohesion are loyalty and tradition. Success is defined by the concern for the employees and the internal climate;

– Adhocracy culture, which is associated with dynamism and entrepreneurship, and values experimentation, innovation and, if necessary, change, if that is what it takes for the organization to remain at the forefront of its field and create original and unique products and services;

– Hierarchy Culture, which is defined by formality, structure and rigid procedures and rules. Leaders are efficient coordinators and organizers who ensure the organization runs smoothly and achieves long-term stability, predictability and efficiency;

– Market Culture, which is oriented towards competitiveness and focuses on getting better results than competitors. Leaders are demanding, competitive and stress the need to meet the organization's long term business goals.

2.5. Research hypotheses

The Air Force Academy offers two types of courses for the career officers of the Portuguese Air Force's (PoAF). They are:

– The Master's Degree in Military Aeronautics (CCMA), which is usually attended by students who completed their secondary education in civilian institutions, and has (on "average") a duration of up to six years[5] (depending on the area of specialty: Pilot, Aeronautical Administration, Aeronautical Engineering and Medicine) (AFA, 2015).

– The Military Technical Training Program (ETM), which is attended by military personnel with a higher education degree who received their basic military training at the Military and Technical Training Centre of the Air Force (CFMTFA) (Notice No. 3243/2021 of 23 February) – however, some civilian students can also enrol (e.g. psychologists, lawyers and doctors, as set out in Notice no. 3245/2021 of 23 February) –, has a duration of one academic semester and also provides acccess to the CS (Career Staff) (Decision No. 10545/2021 of 27 October).

Not only is the length of training in the AFA different for CCMA and ETM students, the latter group is more heterogeneous because ETM students have already had several different experiences of "contact with" and "working in" the PoAF (with the exception of psychologists, doctors and lawyers). In other words, this heterogeneity is due to the fact that, when they enroll in the AFA, they already have their own somewhat solidified perceptions of military experience and training as a result of belonging to different categories and being stationed in diffferent units. Furthermore, greater age differences in a group are reported to have a negative impact on that groups' identification with the organization (Innocenti et al., 2013), which raises the following hypothesis:

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[5] On "average" because the PILAV course has a duration of 5 school years and 1 semester and the other specialties have a duration of 6 school years (AFA, 2015), and it is not uncommon for students to take one or even two years more to complete the course (a total of 7 / 8 years) due to operational reasons (such as insufficient grades or lack of available aircraft for flight training / lack of weather conditions, in the case of PILAV). For this reason, this study was expanded to include students that have been in the AFA for 7 years".

H1: CCMA students and ETM students have different perceptions of Organizational Climate

Hofstede (1991) argues that, when individuals join a new organization, they bring their culture into the collective culture, and Parker (2000) states that organization and culture are inseparable concepts. Even though CCMA and ETM students are trained in a common space (the AFA) where they have similar experiences, the different lengths of the courses and the students' background before enrolling in the AFA (most ETM students already have some military training and experience) provide a basis for the following hypothesis:

H2: CCMA students and ETM students have different perceptions of Organizational Culture

Guzzo et al. (2014) state that Organizational Climate is composed of multiple climates ("microclimates"), which differ between subgroups within the organization. In the case of the CCMA, the effects of these subgroups may be felt across different years. This leads to the following hypothesis:

H3: Students enrolled in different years of the CCMA have different perceptions of Organizational Climate

The following hypothesis regarding Organizational Culture is based on the arguments made by:

– Schein (2016), that in large organizations, sub-units develop their own subcultures that branch out from the predominant culture, which, in the case of the AFA, may indicate the presence of specific cultures in different course years;

– Hofstede (1991), regarding the fact that organizations can be subdivided into different cultures depending on their members' hierarchical level and role in the organization, which, in the case of the AFA, may indicate that students from different course years, who perform different roles in the academic and military student hierarchy, could be at different stages of acculturation to the military;

– Reichers (1987), that the training provided by the organization contains signs that allow its members to deduce some aspects of the Organizational Culture, which, in the case of the AFA, may indicate that culture could have different meanings as a result of different curricula, teachers and training methodologies.

H4: Students enrolled in different years of the CCMA have different perceptions of Organizational Culture

For Saraiva and Almeida (2017), climate emerges naturally from culture (i.e., Organizational Culture is expressed through Organizational Climate). Fontes (2011) describes climate as a superficial component of culture and Keyton (2011), as stated above, views climate as a manifestation of culture. Bases on this, the following hypothesis was proposed:

H5: In the AFA, there is a relationship between Organizational Climate and Organizational Culture

3. Methodology and method

3.1. Metohodology

Methodologically, the study uses deductive reasoning, which involves working from the general to the particular (Santos & Lima, 2019, p. 19), a quantitative research strategy and a case study research design.

3.2. Method

3.2.1. Participants and procedures

Participants. The pre-test phase sample consisted of seven previously selected potential participants from different course years and specialties / areas of activity. The test phase sample comprised 233 CCMA students (91% of N = 256) and 11 ETM students (73% of N = 15), most of whom are enrolled in the CCMA (specifically, PILAV = 99 and Engineering = 88, with ages from [18, 21], n = 155) (Table 1).

Table 1 – Descriptive analysis of the sample

Variable			n
Fields of activity[6]			
	CCMA	PILAV	99
		Engineering	88
		ADMAER	36
		MED	10
	ETM	Support	6
		Maintenance	1
		Operations	4
Ages			
	18 – 21		155
	22 – 25		76
	26 – 29		4
	30 – 33		8
	34 – 37		1

Procedure. All potential participants were informed of the study objectives and assured that the data collected would be used exclusively for the purposes of this study or for future studies on the same topic, with the author's permission. The participants were also informed of their right to the anonymity and confidentiality of their responses. Concurrently,

[6] The analysed areas of activity of ETM students correspond to the areas in which personnel is currently being trained, which are specified in the 2021 admission notices.

a questionnaire survey prepared using Google Forms was sent to each potential respondent, both in the pre-test phase (21-23 November 2021) and in the test phase (9-23 December 2021).

3.2.2. Data collection instruments

A three part questionnaire survey was prepared. The first part collected the participants' sociodemographic data. The other two parts contained questions related to Organizational Climate and Organizational Culture, as explained below.

Organizational Climate Measure (OCM). A version of the OCM proposed by Patterson et al. (2004) and adapted by the author[7] was used in the survey, containing 52 items answered on a 4-point Likert scale (1 = Strongly disagree and 4 = Strongly agree), grouped into eleven dimensions and integrated into three models (Human Relations Model, Internal Process Model and Rational Goal Model). These dimensions had reliability coefficients (Cronbach's α[8]) between 0.67 and 0.91, which Hill and Hill (2002, p. 149) considered poor and excellent, respectively.

Organizational Culture Assessment Instrument [OCAI]. The study used the version adapted by Lopes et al. (2018) for the AFA, based on the version of the OCAI translated and validated for Portugal by Machado (2002), which comprises 26 items answered on a 5-point Likert scale (1 = Strongly disagree and 5 = Strongly agree), grouped into four types of culture (Clan Culture, Hierarchy Culture, Adhocracy Culture and Market Culture), with reliability indices between 0.71 and 0.79, which are considered acceptable (Hill & Hill, 2002, p. 149).

3.2.3. Data processing technique

The data were processed using Statistical Package for Social Sciences (SPSS 28.0) and Jeffrey's Amazing Statistics Program (JASP 0.16.0.0) software.

4. Analysis of findings

This section contains the psychometric analysis of the instruments used in the study (which was carried out using reliability and confirmatory factor analysis) and the analysis of the mean differences obtained.

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[7] Using the same method as Diniz and Fachada (2019, p. 17), "[The scale was] adapted using the procedure devised by Fachada (2015, p.43), which involved first, translating the scales from English to current and fluent Portuguese. The translation was done by the author of this study (who is a proficient speaker of the language)" and a blind revision was performed by a service member from the AFA language department whose proficiency in English language corresponds to level C2 (Mastery) of the Common European Framework of Reference for Languages. Also using the same method as Diniz and Fachada (2019, p. 17), "[this] version was revised by two different people [who are English lecturers at the Academy]. The two revisions were then compared." This version was back-translated by a lecturer from the AFA language department. The final version obtained by comparing the back-translated version and the original scale (which did not differ much) was then pre-tested.

[8] Cronbach's Alpha coefficient is considered poor from [0.6 ; 0.7[, acceptable from [0.7 ; 0.8[, good from [0.8 ; 0.9[and excellent when ≥ 0.9 (Hill, & Hill, 2002).

4.1. Psychometric analysis of the instruments

4.1.1. Reliability analysis

There are several ways to assess the reliability of the measurement instruments, one of which is Cronbach's Alpha (Sampieri et al., 2013).

The questionnaire on Organizational Climate included 52 items divided by three models. The reliability analysis of the autonomy dimension revealed a Cronbach's alpha of 0.448, which is considered unacceptable[9]. After removing items K3 and K5, the index increased to $\alpha = 0.645$ (considered poor). The reliability analysis of the tradition dimension revealed a Cronbach's alpha of 0.597 (unacceptable). After removing item K37, a Cronbach's alpha of $\alpha = 0.611$ (poor) was obtained for this dimension.

Although the OCM scale (Table 2) obtained a Cronbach's alpha of 0.941 (considered excellent), the Internal Process model obtained the lowest alpha, with a score of 0.505 (unacceptable). According to Pallant (2020) Cronbach's Alpha is influenced by the number of items. Therefore, an exception was made to the classification proposed by Hill and Hill (2002) by accepting Alphas greater than or equal to 0.5 for $n < 10$, as the Internal Process model had positive item-total correlation values.

Table 2 – Cronbach's Alphas of the factors and dimensions of Organizational Climate

Model	α	Dimension	Number of items	α
Human Relations	0.938	Autonomy	3	0.645
		Integration	5	0.715
		Participation	6	0.826
		Supervisor support	5	0.903
		Training	4	0.776
		Well-being	4	0.893
Internal Process	0.505	Formalization	5	0.723
		Tradition	3	0.611
Rational Goal	0.871	Effort	4	0.706
		Performance feedback	5	0.818
		Quality	4	0.706

The scale used to assess Organizational Culture contains 26 items divided into four models. The reliability analysis of the Hierarchy Culture model showed a Cronbach's alpha of 0.611 (poor). After removing item C12, the dimension had a Cronbach's alpha of $\alpha = 0.631$. The internal consistency analysis of the Market Culture model showed a Cronbach's Alpha

[9] According to Hill and Hill (2002, p. 149) a Cronbach's Alpha ≥ 0.9 is considered excellent; good from [0.8 ; 0.9[; acceptable from [0.7 ; 0.8[; poor from [0.6 ; 0.7[; and unacceptable when < 0.6. From this point on, the assessment of the "quality" of Cronbach's Alpha values will refer to this classification by Hill and Hill (2002, p. 149). To avoid unnecessary repetitions, the classification will not be described in full.

of 0.580 (unacceptable). After removing items C7 and C19, the dimension had a Cronbach's Alpha of $\alpha = 0.751$ (acceptable).

Table 3 contains the Cronbach's Alphas for the four Organizational Culture models. The OCAI scale had an Alpha of 0.920, which indicates that the scale's overall internal consistency index is excellent (Hill & Hill, 2002). The Clan Culture and Adhocracy Culture models showed good internal consistency, the Market Culture model had acceptable internal consistency and the Hierarchy Culture model had poor internal consistency. A previous study (Pierce, 2010) found that, in military contexts, the Hierarchy Culture model of this scale obtained a Cronbach's Alpha ($\alpha = 0.69$), which does not fall in the acceptability threshold. Another study on the AFA (Lopes et al., 2018) obtained similar results ($\alpha = 0.65$).

Table 3 – Cronbach's Alphas of the Organizational Culture factors

Model	Number of items	α
Clan	6	0.844
Adhocracy	6	0.828
Hierarchy	5	0.631
Market	4	0.751

4.1.2. Confirmatory factor analysis

To test the study's theoretical congruence, a confirmatory factor analysis (CFA) was performed on the original 3F solution (climate) and 4F solution (culture), which generated the diagrams in Figures 3 to 6.

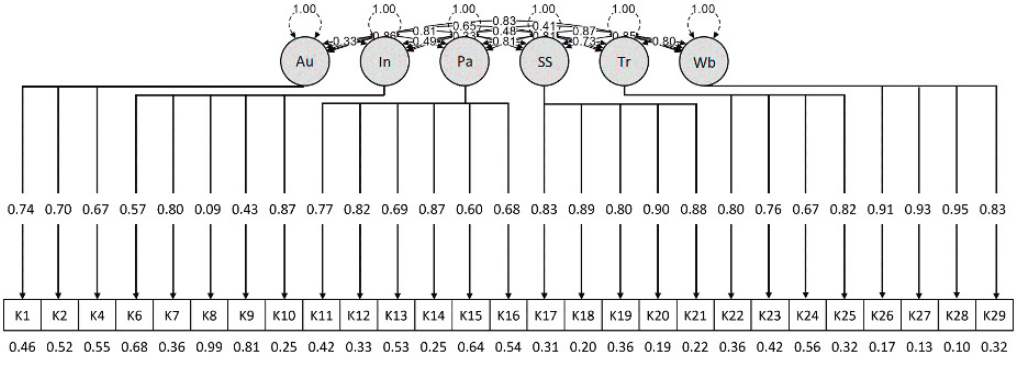


Figure 3 – CFA model generated for the Human Relations model

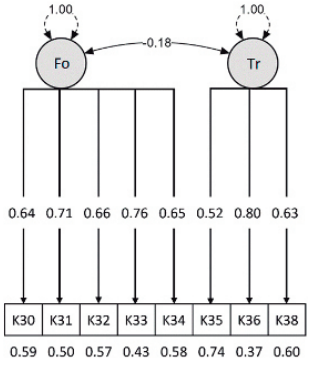


Figure 4 – CFA model generated for the Internal Process model

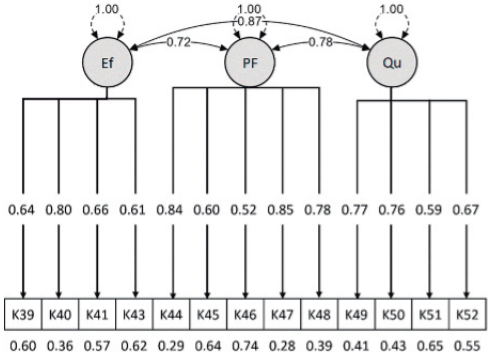


Figure 5 – CFA model generated for the Rational Goal Model

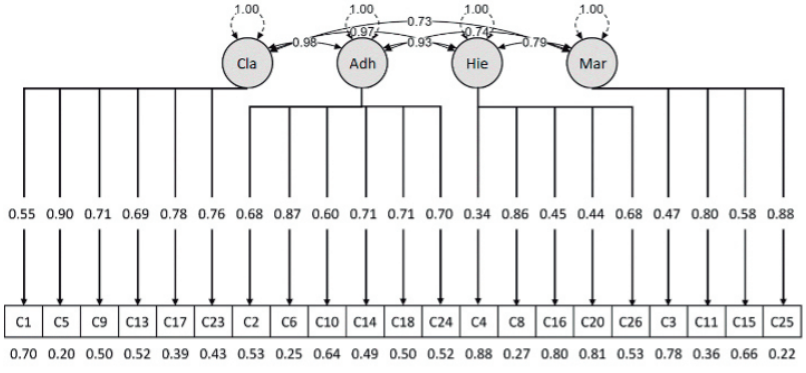


Figure 6 – CFA model generated for the Organizational Culture variable

After removing item K42 (from the effort dimension of the Rational Goal Model), the CFA of the climate factors showed the goodness of fit indices in Table 4. As for the culture factors, the CFA also showed adequate goodness of fit indices. Specifically, the goodness of fit indices in Table 4 correspond to: the CFI and TLI values considered good in all Organizational Climate and Culture models; the RMSEA values considered desirable in the Human Relations and Clan Culture models, and good in the remaining models; and the SRMR values considered desirable in all models of the two variables (Tabachnick & Fidell, 2019).

Table 4 – Goodness of fit indices obtained by the CFA[10]

		CFI	TLI	RMSEA	SRMR
Organizational Climate	Human Relations	0.992	0.991	0.067	0.074
	Internal Process	0.983	0.975	0.057	0.067
	Rational Goal	0.992	0.990	0.053	0.062
Organizational Culture	Clan	0.994	0.990	0.080	0.054
	Adhocracy	0.996	0.994	0.054	0.041
	Hierarchy	0.993	0.985	0.050	0.045
	Market	1.000	1.000	0.000	0.012

4.2. Analysis of mean differences

This section analyses the mean differences obtained by the Organizational Climate and Culture variables according to type of training, course year and specialty, as well as the correlations between the models.

4.2.1. Mean differences in the variable Organizational Climate

Given the significant difference between the dimensions of the sub-samples composed of CCMA (n = 233) and ETM (n = 11) students, a non-parametric Mann-Whitney test was used, which found significant mean differences ($p < 0.05$) (Table 5) between CCMA and ETM students in the Human Relations model.

Table 5 – Mann-Whitney test performed on the factors of the Organizational Climate variable

Model	Samples	n	Average[11]	Standard deviation	Significance
Human Relations	CCMA	233	2.352	0.529	**0.012**
	ETM	11	2.748	0.424	
Internal Process	CCMA	233	2.954	0.410	0.063
	ETM	11	3.209	0.330	
Rational Goal	CCMA	233	2.943	0.518	0.173
	ETM	11	3.122	0.344	

[10] CFI and TLI values ≥ 0.95 are considered good, RMSEA values ≤ 0.06 are considered good and values from]0.06 ; 0.10] are desired, and SRMR values ≤ 0.08 are desired (Tabachnick & Fidell, 2019, pp. 560-564).

[11] Even though the Mann-Whitney test, which is non-parametric, assesses the significance of mean differences, the tables show the mean scores obtained by the items of the models for the sub-samples under analysis due to their descriptive value, as they make it easier to compare means regardless of the type of test that is used.

The significance of the mean differences in the Human Relations model was high, thus a Mann-Whitney test was performed on the model's dimensions, which revealed that the differences stem from the fact that ETM students have a stronger perception of support from supervisors ($p < 0.01$) (Table 6).

Table 6 – Mann-Whitney test performed on the dimensions of the Human Relations model

Model	Samples	n	Average	Standard deviation	Significance
Autonomy	CCMA	233	1.681	0.549	0.125
	ETM	11	1.939	0.512	
Integration	CCMA	233	2.898	0.535	0.057
	ETM	11	3.255	0.482	
Participation	CCMA	233	2.042	0.633	0.059
	ETM	11	2.394	0.651	
Supervisor support	CCMA	233	2.334	0.775	**0.004**
	ETM	11	2.946	0.336	
Training	CCMA	233	2.697	0.688	0.058
	ETM	11	3.046	0.445	
Well-being	CCMA	233	2.461	0.835	0.068
	ETM	11	2.909	0.701	

Table 7 shows the results of the One-Way ANOVA test with Welch correction applied to different course years in the Human Relations model, which had to be peformed due to the significant difference in sample size and / or heterogeneity of variances. The Welch correction resulted in an index with a significance of 0.000, which confirms that the mean differences between course years are significant (Table 7).

Table 7 – One-Way ANOVA test performed on the Human Relations model

Model	Samples	n	Average	Standard deviation	Significance
Human Relations	1st year	44	3.131	0.271	**0.000**
	2nd year	73	2.204	0.420	
	3rd year	30	2.211	0.472	
	4th year	33	2.112	0.307	
	5th year	23	2.125	0.324	
	6th year	19	2.155	0.390	
	7th year in the AFA	11	2.142	0.379	
Total		233	2.352	0.529	

Table 8 shows the significance of the Games-Howell post-hoc test. This test was used due to the presence of heteroscedasticity, and the results revealed significant mean differences between 1st year students and students from other years ($p < 0.001$).

Table 8 – Games-Howell post-hoc test performed on the Human Relations model

Sig.	1st year	2nd year	3rd year	4th year	5th year	6th year	7th year in the AFA
1st year	1						
2nd year	**0.000**	1					
3rd year	**0.000**	1.000	1				
4th year	**0.000**	0.863	0.956	1			
5th year	**0.000**	0.964	0.986	1.000	1		
6th year	**0.000**	0.999	0.999	1.000	1.000	1	
7th year in the AFA	**0.000**	0.999	0.999	1.000	1.000	1.000	1

A One-Way ANOVA test was also performed on the Internal Process model, but no significant mean differences were found ($p > 0.05$) (Table 9).

Table 9 – One-Way ANOVA test performed on the Internal Process model

Model	Samples	n	Average	Standard deviation	Significance
Internal Process	1st year	44	2.961	0.284	0.428
	2nd year	73	2.952	0.378	
	3rd year	30	2.986	0.458	
	4th year	33	2.974	0.485	
	5th year	23	2.752	0.441	
	6th year	19	3.059	0.499	
	7th year in the AFA	11	3.036	0.401	
Total		233	2.954	0.410	

Tables 10 and 11 show the mean scores of the Rational Goal Model obtained in the ANOVA and the significance of the mean differences obtained in the post-hoc Games-Howell test (which had to be performed due to heteroscedasticity). Table 10 shows that, in the Rational Goal Model, there are significant mean differences ($p < 0.001$) among CCMA students. Table 11 shows that there are significant mean differences between 1st year CCMA students and all other students ($p < 0.001$), and between 4th year CCMA students ($p < 0.05$), 5th year students ($p < 0.01$) and 6th year students ($p < 0.01$), when compared to 2nd year students.

Table 10 – One-Way ANOVA test performed on the Rational Goal Model

Model	Samples	n	Average	Standard deviation	Significance
Rational Goal	1st year	44	3.661	0.245	**0.000**
	2nd year	73	2.945	0.378	
	3rd year	30	2.804	0.456	
	4th year	33	2.702	0.348	
	5th year	23	2.516	0.412	
	6th year	19	2.557	0.323	
	7th year in the AFA	11	2.729	0.331	
Total		233	2.944	0.518	

Table 11 –Games-Howell post-hoc test perfromed on the Rational Goal Model

Sig.	1st year	2nd year	3rd year	4th year	5th year	6th year	7th year in the AFA
1st year	1						
2nd year	**0.000**	1					
3rd year	**0.000**	0.748	1				
4th year	**0.000**	**0.029**	0.953	1			
5th year	**0.000**	**0.002**	0.216	0.575	1		
6th year	**0.000**	**0.001**	0.305	0.734	1.000	1	
7th year in the AFA	**0.000**	0.463	0.997	1.000	0.673	0.804	1

The post-hoc Games-Howell test (Table 11) showed significant mean differences in the Rational Goal Model between 2nd year students and 4th year ($p < 0.05$), 5th year ($p < 0.01$) and 6th year students ($p < 0.01$). Therefore, an analysis of the model's dimensions was performed. The result of the Mann-Whitney test (Table 12) provided a reason for the mean differences, as 2nd year students had higher perceptions of effort ($p < 0.001$) and quality ($p < 0.001$) than 4th, 5th and 6th year students.

Table 12 – Mann-Whitney test performed on the dimensions of the Rational Goal Model

Model	Samples	n	Average	Standard deviation	Significance
Effort	2nd year	73	3.065	0.402	**0.000**
	4th, 5th and 6th years	75	2.627	0.547	
Performance feedback	2nd year	73	2.548	0.626	0.089
	4th, 5th and 6th years	75	2.381	0.463	
Quality	2nd year	73	3.223	0.472	**0.000**
	4th, 5th and 6th years	75	2.817	0.528	

A Student's t-test, used to assess independent samples, was performed to analyse the mean differences found in the Organizational Climate factors between students who are enrolled exclusively in the AFA and those who are also attending another education establishment.

During the years in which students attend a Public Higher Education Institution (IESP), that is, from their 4th to 7th year in the AFA, significant differences were found in the Human Relations model ($p < 0.05$), as shown in Table 13.

Table 13 – Results of the Student's t-test performed on each factor of the Organizational Climate variable for 4th to 7th year AFA students

Model	Samples	n	Average	Standard deviation	Significance
Human Relations	AFA students	39	2.034	0.279	**0.016**
	Co-enrolled students	47	2.207	0.359	
Internal Process	AFA students	39	2.987	0.484	0.419
	Co-enrolled students	47	2.904	0.469	
Rational Goal	AFA students	39	2.615	0.385	0.417
	Co-enrolled students	47	2.631	0.349	

As the only mean differences obtained in the Human Relations model were found between AFA students and co enrolled students from the 4th year to the 7th year, a Mann-Whitney test was performed to analyse the model's dimensions, which revealed that they stemmed from significant differences in autonomy ($p < 0.01$) and participation ($p < 0.01$) (Table 14).

Table 14 – Mann-Whitney test performed on the dimensions of the Human Relations model

Model	Samples	n	Average	Standard deviation	Significance
Autonomy	AFA students	39	1.419	0.380	**0.007**
	Co-enrolled students	47	1.695	0.476	
Integration	AFA students	39	2.692	0.537	0.075
	Co-enrolled students	47	2.898	0.526	
Participation	AFA students	39	1.628	0.337	**0.006**
	Co-enrolled students	47	1.879	0.463	
Supervisor support	AFA students	39	1.985	0.559	0.786
	Co-enrolled students	47	2.064	0.670	
Training	AFA students	39	2.378	0.490	0.463
	Co-enrolled students	47	2.468	0.528	
Well-being	AFA students	39	2.103	0.603	0.327
	Co-enrolled students	47	2.239	0.612	

The statistical similarity in the means obtained by the 2nd and 3rd year students made it possible to treat them as a homogeneous group in the Student's t-test, which did not reveal significant mean differences among specialties during the years in which the students attend classes exclusively in the AFA (from the 1st to the 3rd course years), because no p-values < 0.05 were observed.

The analysis of the Organizational Climate dimensions showed that, as CCMA students advance (from the 1st to the 5th year), the mean values obtained for all the analysed variables decrease, except for the autonomy and tradition dimensions.

4.2.2. Mean differences in the variable Organizational Culture

Given the significant difference between the dimensions of the sub-samples composed of CCMA students and ETM students, a non-parametric Mann-Whitney test was performed, which found significant mean differences ($p < 0.05$) (Table 15) between CCMA and ETM students in the Hierarchy Culture model.

Table 15 – Mann-Whitney test performed on the factors of the Organizational Culture variable

Model	Samples	n	Average	Standard deviation	Significance
Clan	CCMA	233	3.348	0.851	0.710
	ETM	11	3.467	0.799	
Adhocracy	CCMA	233	2.964	0.854	0.299
	ETM	11	3.212	0.699	
Hierarchy	CCMA	233	3.528	0.644	**0.028**
	ETM	11	3.964	0.528	
Market	CCMA	233	3.557	0.771	0.897
	ETM	11	3.591	0.664	

Tables 16 to 19 contain the results of the One-Way ANOVA tests performed on the Clan Culture ($p < 0.001$), Adhocracy Culture ($p < 0.001$), Hierarchy Culture ($p < 0.001$) and Market Culture ($p < 0.001$) models, which show significant mean differences between all the models. The significance values of the mean differences between course years are highlighted in bold in Tables 20 to 23, which contain the results of the Tukey HSD post-hoc tests (this type of test was used due to homogeneity of variances).

Table 16 – One-Way ANOVA test performed on the Clan Culture model

Model	Samples	n	Average	Standard deviation	Significance
Clan	1st year	44	4.424	0.431	**0.000**
	2nd year	73	3.338	0.656	
	3rd year	30	3.161	0.816	
	4th year	33	2.808	0.708	
	5th year	23	2.913	0.570	
	6th year	19	2.702	0.647	
	7th year in the AFA	11	3.273	0.716	
Total		233	3.348	0.851	

Table 17 – One-Way ANOVA test performed on the Adhocracy Culture model

Model	Samples	n	Average	Standard deviation	Significance
Adhocracy	1st year	44	4.034	0.595	**0.000**
	2nd year	73	2.865	0.613	
	3rd year	30	2.844	0.869	
	4th year	33	2.662	0.515	
	5th year	23	2.623	0.676	
	6th year	19	2.114	0.671	
	7th year in the AFA	11	2.758	0.844	
Total		233	2.964	0.854	

Table 18 – One-Way ANOVA test performed on the Hierarchy Culture model

Model	Samples	n	Average	Standard deviation	Significance
Hierarchy	1st year	44	4.246	0.464	**0.000**
	2nd year	73	3.485	0.566	
	3rd year	30	3.427	0.492	
	4th year	33	3.236	0.556	
	5th year	23	3.130	0.469	
	6th year	19	3.263	0.718	
	7th year in the AFA	11	3.382	0.414	
Total		233	3.528	0.644	

Table 19 – One-Way ANOVA test performed on the Market Culture model

Model	Samples	n	Average	Standard deviation	Significance
Market	1st year	44	4.142	0.637	**0.000**
	2nd year	73	3.545	0.699	
	3rd year	30	3.625	0.694	
	4th year	33	3.356	0.753	
	5th year	23	3.294	0.714	
	6th year	19	2.947	0.775	
	7th year in the AFA	11	3.318	0.742	
Total		233	3.557	0.771	

As shown in Table 20, mean differences in Clan Culture were found between: 1st year students and all other students ($p < 0.01$); and between 2nd year students and 4th and 6th year students ($p < 0.05$).

Table 20 – Tukey HSD post-hoc test performed on the Clan culture model

Sig.	1st year	2nd year	3rd year	4th year	5th year	6th year	7th year in the AFA
1st year	1						
2nd year	**0.000**	1					
3rd year	**0.000**	0.938	1				
4th year	**0.000**	**0.010**	0.537	1			
5th year	**0.000**	0.063	0.848	0.996	1		
6th year	**0.000**	**0.011**	0.324	0.998	0.921	1	
7th year in the AFA	**0.004**	1.000	0.999	0.524	0.763	0.350	1

As Table 21 shows, mean differences were found in Adhocracy Culture between: 1st year students and all other students ($p < 0.01$); 6th year and 2nd year students ($p < 0.01$) and 3rd year students ($p < 0.05$).

Table 21 – Tukey HSD post-hoc test performed on the Adhocracy Culture model

Sig.	1st year	2nd year	3rd year	4th year	5th year	6th year	7th year in the AFA
1st year	1						
2nd year	**0.000**	1					
3rd year	**0.000**	1.000	1				
4th year	**0.000**	0.569	0.951	1			
5th year	**0.000**	0.726	0.941	1.000	1		
6th year	**0.000**	**0.003**	**0.029**	0.060	0.211	1	
7th year in the AFA	**0.006**	0.999	1.000	1.000	0.999	0.362	1

As Table 22 shows, mean differences were found in the scores obtained for Hierarchy Culture between 1st year students and all other years ($p < 0.001$).

Table 22 – HSD Tukey post-hoc test performed on the Hierarchy Culture model

Sig.	1st year	2nd year	3rd year	4th year	5th year	6th year	7th year in the AFA
1st year	1						
2nd year	**0.000**	1					
3rd year	**0.000**	0.998	1				
4th year	**0.000**	0.353	0.777	1			
5th year	**0.000**	0.062	0.299	0.987	1		
6th year	**0.000**	0.868	0.974	1.000	0.992	1	
7th year in the AFA	**0.000**	0.988	1.000	0.965	0.693	0.997	1

As for Market Culture, Table 23 shows mean differences between 1st year students and all other years except students enrolled in their 7th year in the AFA ($p < 0.05$).

Table 23 – Tukey HSD post-hoc test performed on the Market Culture model

Sig.	1st year	2nd year	3rd year	4th year	5th year	6th year	7th year in the AFA
1st year	1						
2nd year	**0.000**	1					
3rd year	**0.030**	0.998	1				
4th year	**0.000**	0.883	0.758	1			
5th year	**0.000**	0.755	0.622	1.000	1		
6th year	**0.000**	0.068	0.053	0.525	0.747	1	
7th year in the AFA	0.053	0.956	0.887	1.000	1.000	0.846	1

The mean differences obtained for the factors of the Organizational Culture variable between students attending classes exclusively at the AFA and students attending other IESP, that is, from their 4th to 7th year in the AFA, were ascertained through a Student's t-test, which is used to analyse independent samples. As Table 24 shows, significant differences were found in the Hierarchy Culture model ($p < 0.05$).

Table 24 – Student's t-test performed on the factors of the Organizational Climate variable for students attending their 4th to 7th year in the AFA

Model	Samples	n	Average	Standard deviation	Significance
Clan	AFA students	39	2.812	0.623	0.453
	Co-enrolled students	47	2.922	0.713	
Adhocracy	AFA students	39	2.483	0.614	0.456
	Co-enrolled students	47	2.592	0.720	
Hierarchy	AFA students	39	3.067	0.482	**0.011**
	Co-enrolled students	47	3.370	0.579	
Market	AFA students	39	3.192	0.804	0.562
	Co-enrolled students	47	3.287	0.709	

In the 2nd and 3rd years, no significant mean differences were found between AFA students and co enrolled students because no $p < 0.05$ values were observed. However, in the 1st year, significant mean differences were found between AFA students and co enrolled students (Table 25) in the Adhocracy Culture ($p < 0.05$) and Market Culture ($p < 0.05$) models.

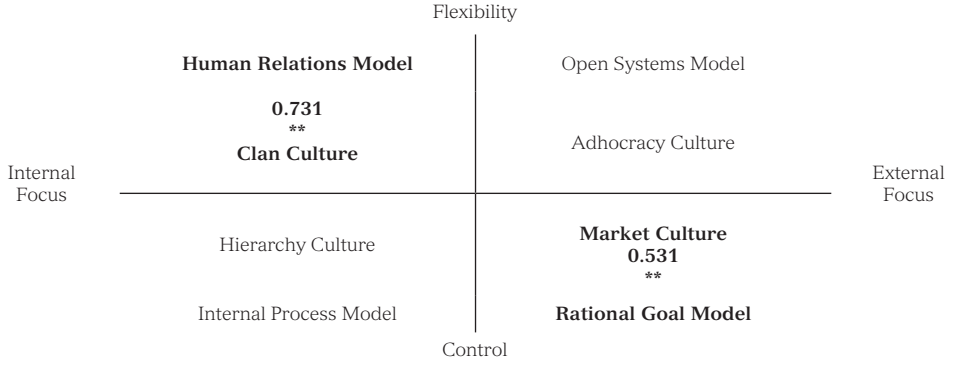
Table 25 - Student's t-test performed on each factor of the Organizational Culture variable for 1st year students

Model	Samples	n	Average	Standard deviation	Significance
Clan	AFA students	17	4.363	0.097	0.459
	Co-enrolled students	27	4.463	0.087	
Adhocracy	AFA students	17	3.794	0.159	**0.032**
	Co-enrolled students	27	4.185	0.098	
Hierarchy	AFA students	17	4.106	0.107	0.115
	Co-enrolled students	27	4.333	0.089	
Market	AFA students	17	3.868	0.193	**0.021**
	Co-enrolled students	27	4.315	0.086	

One-Way ANOVA tests were performed to assess the mean differences between specialties in the years corresponding to cadet-student graduation for each Organizational Climate and Organizational Culture model. The tests did not reveal significant mean differences among specialties in any course year ($p > 0.05$).

4.3. Correlations between the variables in the models

Figure 7 shows strong, statistically significant correlations between the Human Relations model and Clan Culture ($p = 0.731$) and between the Rational Goal and Market Culture models ($p = 0.531$). Furthermore, a strong, significant correlation was found between Organizational Climate and Organizational Culture ($p = 0.752$).



* Correlation is significant when p < 0.05; ** correlation is significant below 0.01 (2 tails).

Figure 7 – Pearson correlations between the Organizational Climate and Organizational Culture models

Figure 8[12] shows the Organizational Climate and Organizational Culture profiles that correspond to the means of the quadrants of the competing values framework for all AFA students. The Internal Process and Rational Goal models and the corresponding types of culture (Hierarchy Culture and Market Culture) obtained the highest mean scores.

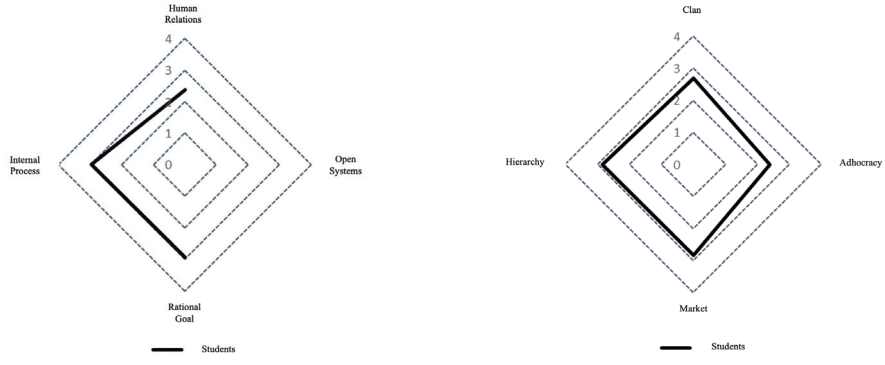


Figure 8 – Competing Values Framework applied to Organizational Climate and Culture

[7] The Organizational Culture model was resized to a 1:4 scale.

5. Discussion of findings

The empirical evidence obtained in the above analyses confirmed the five hypotheses, three of which were "fully" confirmed (H3 to H5). The remaining two (H1 and H2) were partially confirmed, as explained below.

***H1* test:** *CCMA students and ETM students have different perceptions of Organizational Climate*.

H1 is partially confirmed because significant differences were only found between CCMA students (with the exception of 1st year students) and ETM students in the Human Relations model. The greater support perceived by ETM students, as well as by 1st year students, may be due the fact that, at the time the questionnaire was delivered, they had only recently enrolled in the AFA and were still in the initial stages of learning the (appropriate) way of being, behaving and thinking as new members of the organization (Rousseau, 1990; Schein, 1990), and needed more support from those who have been in the organization for longer (Schein, 2010). This means that leadership plays a crucial role because: leadership is one of the main antecedents of organizational climate (Ehrhart & Schneider, 2016, p. 5), leaders are expected to provide direction and purpose (Martin & McCausland, 2002, p. 429, cited in Pierce, 2010); and, by helping subordinates, leaders show concern for their well¬ being, which is one of the characteristics of the Human Relations model (Cameron et al., 2006, p. 79). Moreover, and as shown by González-Romá and Gamero (2012, p. 98), a positive correlation was found between a supportive climate and performance.

***H2* test:** *CCMA students and ETM students have different perceptions of Organizational Culture*.

H2 is partially confirmed because significant mean differences were only found in Hierarchy Culture, where ETM students had higher scores than CCMA students. In a study by Lopes et al. (2018), ETM students had slightly lower mean scores in Hierarchy Culture than CCMA students. However, it was not expected that this study would have similar results, as the group enrolled in the ETM is not the same in both studies, and different groups can develop different subcultures, which may be stronger or weaker than others (Ehrhart & Schneider, 2016, p. 10). However, the results are consistent with Breslin (2000, p. 16), who found that higher ranking officers had higher mean scores regarding their perceptions of the military as a culture of discipline, authority and uniformity, which are characteristic of Hierarchy Culture (Cameron & Quinn, 2011).

***H3* test:** *Students enrolled in different years of the CCMA have different perceptions of Organizational Climate*.

H3 is confirmed because significant mean differences were found between 1st year students and all other CCMA students in the Human Relations Model (cf. what was stated above regarding H1) and the Rational Goal Model. In the second model, this could be related to the fact that 1st year students are in the initial stages of training, and therefore receive more feedback from supervisors, which results in more positive perceptions regarding the quality of the work and effort they produce. The mean differences found for 1st year

students are higher than for CCMA students in all the analysed dimensions, except in the tradition dimension, in which they had significantly lower scores than older CCMA students. These lower scores could be related to the fact they need more time and experiences in the organization to learn how things are done (Schein, 2010).

Furthermore, the fact that 1st year students obtained high scores in all climate quadrants is consistent with the findings of Lopes et al. (2018), as well as Schneider (2000), that climate creates culture. That is, that specific climates that are created are manifestations of the values of the cultures that underpin them (Beus et al., 2020, p. 1). Significant mean differences were also found between 2nd year and 4th, 5th and 6th year students (2nd year students have higher scores regarding their perceptions of effort and quality). This could be due to the fact that they are about to begin the military phase of their training, which is highly demanding and intense, and thus requires resilience (effort), as described by Saltzman et al. (2013, cited in Redmond et al., 2015, p. 9). On the other hand, co enrolled students had higher mean scores in the Human Relations model than PILAV students in the same year. The analysis performed on the dimensions showed that this could be due to the fact that co enrolled students (from the 4th to the 7th year in the AFA) have stronger perceptions of autonomy and participation, which are characteristics often associated with civilian university education (Feng, 2018, p. 34; Sokol et al., 2015, p. 285).

***H4* test:** *Students enrolled in different years of the CCMA have different perceptions of Organizational Culture*.

H4 is confirmed because there are clear differences in all Organizational Culture models between 1st year students and all other CCMA students, as the scores they obtained were significanly high. Even though each year corresponds to a subculture, which can be a more intense version of Organizational Culture (Martin & Siehl, 1983), 1st year students generally had higher mean scores than all other students, but which tend to decrease and stabilise over the following years, confirming the findings of Lopes et al. (2018). This culture change over time is in line with Schein (2000, p. xxv), who found that subgroups within the organization may deviate from the established culture because they do not have enough shared experiences to adopt common assumptions.

In addition to the differences between 1st year students and students from other years, differences were also found in Clan Culture between 2nd year students and 4th and 6th year students (the latter obtained lower scores). As expected, these high scores are lower than those obtained by 1st year students, and higher than the ones obtained by older students. The 2nd year is the beginning of the downward curve identified by Lopes et al. (2018) and by the present study. However, at the time of the survey, 2nd year students were in the most intense stage of their acculturation – e.g., in terms of continued "exposure" to situations where they will acquire the military characteristics consistent with the Clan Culture model, such as a sense of community (esprit de corps), cohesion, willingness to cooperate (camaraderie) and the ability to form lasting partnerships (Cameron et al., 2006). This influence could be strong enough to push the 2nd year scores closer to the 1st year scores. On the other hand, the close contact that the current 2nd year had with the current 5th year in the year before this study

was carried out – during which 2nd and 5th year students had more shared experiences and assimilated more cultural clues (Denisson, 1996) – may be one of the reasons why there are differences in Clan Culture between 4th and 6th year students and 2nd year students, but not between the latter and 5th year students.

With regard to Adhocracy Culture, significant differences were found between 1st year students and students from other years; however, 6th year students obtained lower mean scores than 2nd and 3rd year students, which indicates a weak adhocracy subculture (Ehrhart & Schneider, 2016; Schein, 2016). The fact that the mean scores obtained for this type of culture by all years of the CCMA, with the exception of the 1st year, were not significantly high is positive because it means that there are no differences between subcultures in any aspects that are considered strategic for the organization (Cameron et al., 2006, p. 120), and because it indicates greater organizational commitment and, as a result, greater productivity (Beus et al., 2019, cited in Beus et al., 2020).

Regarding Hierarchy Culture, differences were observed between 1st year students and students enrolled in other years of the CCMA, as the former obtained higher mean scores. This was to be expected because these students are still in a very early stage of their adaptation to the AFA and are constantly adjusting to a military culture defined by structure, framework and rules (Redmond et al., 2015, p. 9), which are characteristics associated with Hierarchy Culture (Cameron & Quinn, 2011; Quinn & Rohrbaugh, 1983). Furthermore, the high mean scores obtained in this culture as a whole (i.e. by all years, when compared to the other culture types), are likely due to the fact that students perceive the organization as an effective higher education establishment because it is stable, predictable and mechanical (Cameron & Quinn, 2011, p. 38).

With regard to Market Culture, differences were only found between 1st year students and students from other years. This culture was as pronounced as Hierarchy Culture (the dominant culture in this type of organization, which is also the case here). According to Cameron and Quinn (2011), this finding is highly significant because it supports the fact that the AFA, in addition to having the cultural identity traits of a military organization, also has cultural traits typical of task oriented, demanding cultures in which winning is emphasised.

The lower mean scores of 1st year PILAV students in the quadrants with external focus, compared to those of students from different specialties, appears to be "paradoxical" because it simultaneously *contradicts* and *echoes* Schein (2016, p. 25), who argues that people who are trained in the same way, are taught the same values, and have a high degree of socialisation during that period have similar cultural values. It *contradicts* it because the conditions and training provided to 1st year students are largely the same, especially during their first months in the AFA. It *echoes* it because students from the PILAV specialty have some hours of pilot training every week, which may play a significant role in these differences.

***H5* test:** *In the AFA, there is a relationship between Organizational Climate and Organizational Culture*.

H5 is confirmed because significant correlations were found between the dimensions of the Organizational Climate models proposed by Patterson et al. (2004) and the Organizational

Culture models proposed by Cameron and Quinn (1999), and between these two variables as a whole. This is in line with the literature because: it confirms Schneider's (2000) reflection that climate is correlated with culture, in addition to creating it; the concepts of climate and culture are conceptually similar (Beus et al., 2020); climate is the superficial manifestation of culture (Parker at al., 2003); while quantitative studies about culture measure organizational values, studies on climate measure perceptions of organizational characteristics which are the manifestation of those values (Schneider et al., 2011).

6. Conclusions

This study aimed to answer the following research question: *What are the characteristics of the Organizational Climate and Organizational Culture of the Air Force Academy?* This question was operationalised using a theoretical model (competing values framework) to analyse three types of Organizational Climate (Human Relations, Internal Process and Rational Goal) and four types of Organizational Culture (Clan, Adhocracy, Hierarchy and Market) using a questionnaire survey that consisted of an Organizational Climate scale (OCM) and an Organizational Culture scale (OCAI).

With regard to the study's **findings**, a more granular analysis of the data (by course and year) showed significant differences between ETM students and CCMA students (with the exception of 1st year students) in the Human Relations and Hierarchy Culture models. The analysis of the responses of CCMA students revealed several important aspects. First year students had higher mean scores in all Organizational Climate and Culture models, except in the Internal Process model, due to their low perceptions of tradition. Overall, the means values of the models tend to decrease as students progress in the course. On the other hand, the perceptions about Organizational Climate and Organizational Culture of the 2nd and 7th year students enrolled in the AFA were relatively homogeneous. The only significant differences in perceptions about climate were found in the Rational Goal Model, between 2nd year students and 4th, 5th and 6th year students; and in perceptions about culture, between 2nd year students and 4th and 6th year students (Clan Culture was more pronounced in the former) and between 6th year students and 2nd and 3rd year students (the former had lower scores in Adhocracy Culture). With regard to specialties, students enrolled in other IESP obtained higher scores in the Human Relations and Hierarchy Culture models; and 1st year PILAV students identified less with the externally focused cultural models (Adhocracy Culture and Market Culture) when compared to other students.

A more macro analysis of the data collected and summarised above showed that, even though the student sample can be subdivided (to reduce the variability of the means) into three groups (1st year students, 2nd to 7th year students from the AFA and ETM students), the global profiles of Organizational Climate and Culture have a similar "geometry", which emphasises control and hierarchy. This shows that students perceive the Internal Process and Rational Goal models as the ones that best describe the Organizational Climate that they experience, and that the types of culture that correspond to them (Hierarchy Culture and Market Culture) best describe the culture of their organization.

This study shows that the AFA was / is perceived: on the one hand, as an organization defined by formality, structure and formal procedures and rules, where management and communication are used to achieve a state of stability and control that promotes efficiency, consistency and uniformity; and, on the other hand, as an organization oriented towards results and goals, with high standards of quality, which are enforced by demanding leaders who assess and give relevant, timely feedback to students about their performance and effort. Therefore, in addition to the cultural traits characteristic of a military organization, the AFA also has cultural traits typical of task oriented, demanding cultures in which winning is emphasised.

The **theoretical contribution** of this dissertation is the empirical data it provided on the benefits of adopting the competing values framework (the most extensively used model in quantitative studies on Organizational Culture) to group specific climates in sub-models / quadrants corresponding to types of Organizational Culture.

As for **practical contributions**, this dissertation provides the AFA's decision-makers, for the first time, a measurement of students' perceptions about Organizational Climate, as well as an updated measurement of their perceptions about Organizational Culture. Both concepts are important in the study of organizations because they have an impact on numerous outcomes, such as job satisfaction (Johnson & McIntye, 1998, p. 848), innovation and effectiveness (Glisson, 2015, p. 247), safety (West et al., 2014, p. 339), well-being in the school environment (Lombardi et al., 2019, p. 7) and organizational commitment (Grant, 2002, p. 139), among others.

The main **limitation** of this research – which was unrelated to it and did not affect the validity of the findings (which was reinforced by the quasi longitudinal design) – refers to the fact that it was not possible to conduct a longitudinal study covering at least two course years, as suggested by several authors who have studied both Organizational Climate and Organizational Culture (Ashkanasy, Broadfoot & Falkus, 2000; González-Romá & Gamero, 2012; Wilderom et al., 2000).

Therefore, **future studies** should include a longitudinal study to assess possible changes in the profile of the competing values framework used in the AFA over time, and to integrate them in planning and decision making, which, as noted by Bacharach and Mundel (1993, cited in Paparone, 2003), tends to change with the arrival of new members with different ways of thinking in the organization. It would also be of interest to conduct a study on Organizational Culture and Climate in the different functional areas of the AFA and the PoAF, based on the studies conducted by Paparone (2003, p. 121), who found that the education, research and managerial departments of a military university of the US Department of Defence had different dominant cultures, and Erhardt (2018), who found differences in culture profile between different units of the US Air Force. It would also be of interest to broaden / replicate this study to all Portuguese military higher education establishments, in order to assess possible trends and establish potential parallels between the climate and culture experienced by the future officers of the AAFF, given the impact of these variables on several outcomes.

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