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Burnout and job demand and resources among Game Developers

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BURNOUT AND JOB DEMAND AND RESOURCES AMONG GAME
DEVELOPERS

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RESUMO

A indústria dos videojogos tem cerca de 50 anos, tendo atualmente um potencial de crescimento maior do que outras indústrias criativas, ultrapassando a música e o cinema. Apesar do desenvolvimento de jogos ser uma profissão relativamente recente, muitos dos seus problemas estão associados a condições de trabalho precárias a que os trabalhadores se sujeitam de modo a manter-se na indústria. Tal implica conseguir gerir e equilibrar as exigências e recursos laborais, pois se predominarem as exigências laborais pode desencadear-se o burnout como um fenómeno ocupacional.

Este estudo tem como objetivo identificar os níveis de burnout, exigências e recursos laborais nos criadores de videojogos, identificar a associação entre estas variáveis e a sua variação de acordo com características sociodemográficas e laborais.

Utilizando questionários online, em português ou em inglês, foram aplicados o Oldenburg Burnout Inventory, Job Demand Scale e Job Resources Scale, a 193 criadores de jogos (88 portugueses e 105 de outras nacionalidades), entre fevereiro de 2019 e junho de 2020.

Relativamente ao burnout, os resultados revelaram níveis moderados de exaustão e desinvestimento, enquanto as exigências laborais evidenciaram níveis elevados de exigências mentais e de concentração, níveis moderados de exigências de tempo, emocionais, materiais, físicas. Os recursos laborais demonstraram níveis elevados de autonomia e moderados de desenvolvimento pessoal, qualidade das relações pessoais, ética e utilidade social do trabalho. A exaustão está correlacionada positivamente com o número de horas de trabalho por semana e as exigências laborais, e negativamente correlacionada com os recursos laborais. O mesmo ocorre com o desinvestimento, exceto relativamente às exigências mentais e de concentração. Utilizando uma análise de regressão, as exigências de tempo explicam 27% da exaustão e o desenvolvimento pessoal explica 14% da exaustão e 51% do desinvestimento.

Pode-se concluir que os criadores de jogos enfrentam condições de trabalho muito exigentes, alertando para a necessidade de desenvolvimento de estratégias de prevenção do burnout e de gestão de exigências laborais através dos recursos laborais, promovendo assim locais de trabalho mais felizes e saudáveis.

Palavras-chave: Burnout, Exigências Laborais, Recursos Laborais, Criadores de Videojogos

ABSTRACT

The video game industry is roughly 50 years old, and currently has a larger growth potential than many other creative industries, surpassing music and film. Although game development is a recent profession, many of its issues have been associated with the straining working conditions experienced by workers to keep themselves in the industry. This requires balancing job demands and job resources, and, in case of prevalence of job demands, it can elicit burnout as an occupational phenomenon.

This study aims to identify burnout and job demand-resources levels among game developers, their relationship, and variation according to social individual/labor characteristics.

Using online questionnaires, either in Portuguese or in English, it were applied the Oldenburg Burnout Inventory, the Job Demand Scale and the Job Resources Scale to 193 game developers (88 Portuguese and 105 from other nationalities), between February 2019 and June 2020.

Regarding burnout, results showed moderate levels of exhaustion and disengagement, while job demands revealed high levels of mental and concentration demands, moderate levels of time, emotional, material, and physical demands. For job resources, we found high levels of autonomy and moderate values of personal development, quality of personal relations, ethical, and social utility of work. Exhaustion is positively correlated with working hours per week and job demands, and negatively with job resources. The same happens with disengagement, except for mental and concentration demands. Using a regression analysis, time demands explained 27% of exhaustion, and personal development explained 14% of exhaustion and 51% of disengagement.

It can be concluded that game developers face very demanding work conditions, alerting to the need to develop strategies for burnout prevention, and for the adequate manage of job demands using job resources, thus, promoting happier and healthier workplaces.

Keywords: Burnout, Job demand-resources, Game Developers.

RÉSUMÉ

L'industrie du jeu vidéo a environ 50 ans, et actuellement elle a un plus grand potentiel de croissance que de nombreuses autres industries créatives, dépassant la musique et le cinéma. Bien que le développement du jeu soit une profession récente, beaucoup de ses problèmes ont été associés aux conditions de travail difficiles vécues par les travailleurs pour se maintenir dans l'industrie. Cependant, il faut équilibrer les demandes d'emploi et les ressources d'emploi, et, en cas de prévalence des demandes d'emploi, cela peut entraîner l'épuisement professionnel en tant que phénomène professionnel.

Cette étude veut identifier l'épuisement professionnel et les niveaux de demandes- -ressources d'emploi parmi les développeurs de jeux, leur relation, et la variation en fonction des caractéristiques sociales individuelles / professionelles.

En utilisant des questionnaires en ligne, en portugais ou en anglais, on a appliqué le *Oldenburg Burnout Inventory*, *Job Demand Scale* et *Job Resources Scale* à 193 développeurs de jeux (88 portugais et 105 d'autres nationalités), entre février 2019 et juin 2020.

Dans ce qui concerne l'épuisement professionnel, les résultats ont montré des niveaux modérés d'épuisement et de désengagement, tandis que les demandes d'emploi ont révélé des niveaux élevés de demandes mentales et de concentration, des niveaux modérés de temps, des exigences émotionnelles, matérielles et physiques. Pour les ressources d'emploi, on a trouvé des niveaux élevés d'autonomie et des valeurs modérées de développement personnel, de qualité des relations personnelles, l'utilité éthique et sociale du travail. L'épuisement est positivement corrélé avec les heures de travail par semaine et les demandes d'emploi, et négativement avec les ressources d'emploi. Il en va de même pour le désengagement, à l'exception des exigences mentales et de concentration. L'analyse de régression a révélé que les demandes de temps expliquent 27% de l'épuisement, et le développement personnel explique 14% de l'épuisement et 51% du désengagement.

On peut conclure que les développeurs de jeux sont confrontés à des conditions de travail très exigeantes, ce que doit alerter sur la nécessité d'élaborer des stratégies de prévention de l'épuisement professionnel, et pour la gestion adéquate des demandes d'emploi en utilisant les ressources de l'emploi, ça veut dire, la promotion de lieux de travail plus heureux et plus sains.

Mots-clés: Burnout, Demande d'emploi, Ressources d'emploi, Développeurs de jeux.

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1. INTRODUCTION[1]

In May 2019, the World Health Organization (WHO, 2019) recognized burnout as an occupational phenomenon due to job demands and the difficulties that workers experience while trying to adjust to them and using their job resources. This phenomenon affects several professions, regardless of being more established or more typical of the 21st century. The video game industry has roughly 50 years, and it currently has a larger growth potential than many other creative industries, surpassing even music and film (Santos, Romeiro, Nunes, Hollins & Riestra, 2017). Although game development is a recent type of profession, many of its issues have been associated with the straining working conditions that workers are subjected to in order to keep themselves in the industry and doing what they're so passionate about. Throughout the years, multiple cases have been made public denouncing the enormous monetary gain for the companies at the expense of their workers' health. Yet, crunch remains a matter of concern to the industry, contributing to the experience of burnout and eventually leading its workers to leave the business and move to more sustainable jobs or even industries (MacGregor, 2019).

More recent and rapid technological advances (e.g., computer, smartphones, tablets) allowed the market to have an immense and fast growth in the last decade, ultimately changing the way that it functions both in the creative and business side (Newzoo, 2018). Now the consumer determines its pace, in an ever-fast-growing industry where its developers are subjected to greater job demands (e.g., unrealistic time constraints and expectations), not always having the required resources to deal with them. Therefore, it is necessary to understand how game developers deal with these issues and learn how they affect their health and their ability to work, in order to develop more effective strategies to diagnose, treat and ultimately prevent this problem in the future.

This study aims to identify burnout, job demands and job resources levels among game developers, their relationship, and variation according to sociodemographic and labour characteristics. Its theoretical framework will focus first on burnout, then the job demand-resources model and the relation between the two. Furthermore, it will explore the concept of game developer and finally its relationship with the first topic. The empirical study was

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[1] This dissertation uses some text and results from the paper submitted:
- Mendes, J., & Queirós, C. (submetido setembro 2020). It's crunch time: Burnout and job demand and resources among Game Developers. *Book of Proceedings of the Videojogos 2020 - 12th International Conference on Videogame Sciences and Arts* (Springer Computer Science Proceedings, Conference 26-28 November 2020).

carried out with 193 game developers, and the current study presents the method, results, discussion, main conclusions, and suggestions for further research about the topic.

1.1. Burnout

Maslach and Jackson (1981) defined burnout as a syndrome of emotional exhaustion and depersonalisation that often affects people who work in human services, making the person feel dispirited about themselves and lacking job fulfilment. Emotional exhaustion is a major factor of burnout, it relates to being so emotionally overwhelmed and worn out by work, that it results in the depletion of the person's emotional and physical resources (Maslach, 1976; Maslach & Jackson, 1981; Maslach, Schaufeli & Leiter, 2001). Depersonalisation refers to negative, cynical behaviours and emotions towards those whom one serves or cares for. This reaction might come across as insensitive and disinterested (Maslach & Jackson, 1981). Finally, there is a feeling of reduced personal accomplishment, where the individual no longer perceives himself as capable of fulfilling the responsibilities of his job (Maslach, Schaufeli & Leiter, 2001). The way burnout manifests itself can take many forms, varying in symptoms and their severity between individuals (Freudenberger, 1974), and even according to one's occupation (Demerouti et al., 2001).

Exhaustion is usually the most apparent direct display of burnout. Hence, when people are referring to being in burnout, they are usually describing the feeling of exhaustion. However, although necessary it is not enough on its own to identify the presence of the phenomenon, because it fails to consider the aspects that relate to the relationship that one has with their job. It leads to emotional and cognitive detachment from work as a way to deal with the overload, and in people-oriented jobs that can be a severe impairment to one's capability to provide quality service for their clients/patients. Depersonalisation then emerges to manage work demands, due to the constant feeling of exhaustion and discouragement, leading to a cynical behaviour towards the recipient of one's services (Maslach & Leiter, 1997; Maslach et al., 2001). Thus, a setting where the individual is under constant work demands may add to the feeling of exhaustion or cynicism and ultimately affect one's perception of effectiveness (Lee & Ashforth, 1996). However, in other work contexts the source of inefficacy could be related to the lack of resources, and exhaustion and cynicism to work overload and social animosity (Maslach et al., 2001).

Historically, the term burnout first appeared in the 1970's associated with emotional state of human services providers. In its early days although there was not a clear consensus

on the definition of the concept there was a relative common understanding about the three core dimensions underlying the phenomenon (Maslach et al., 2001). Only later, with the contribution of industrial-organizational psychology, burnout was viewed as a kind of job stressor and connected with job satisfaction and turnover. During this time, the research about the concept extended beyond occupations related to education and human services and started to include a variety of other jobs, including professionals working with computer technology (see Singh & Suar, 2012; Sonnentag et al., 1994). Furthermore, it started to address burnout as a consequence of an interaction between the individual and the work environment with more sophisticated methodology and research tools (Maslach et al., 2001).

There are several theories focused on why burnout emerges. Some argue that there are incredibly devoted people who, in order to support their goals, give too much of themselves, eventually leading to exhaustion when they cannot attain their objectives. Another one is that chronic job stressors in the long run can lead to burnout, therefore it is something that should occur more frequently later in one's career and that it is rather stable over time. There is also the question whether burnout is a result of overload (i.e. too many work demands and too little resources to deal with them), or underload (i.e. boredom) (Maslach et al., 2001).

Burnout has been strongly associated with negative consequences on one's job performance lowering their productivity and effectiveness overtime, ultimately resulting in a reduction in their job and/or organisational commitment and satisfaction and leading to higher rates of absenteeism and even turnover. A study by Peterson and colleagues (2011) supported the association between burnout and future sickness absence, with exhaustion showing a stronger relation than disengagement. This can also lead to an increase in personal conflicts between work colleagues and disturbances in some related tasks. It also has an impact on one's health, especially mental health, and can lead to an increase in anxiety, depression, a lowered self-esteem and even to work-family conflict (Hakanen, & Schaufeli, 2012; Maslach et al., 2001).

Although burnout is a different construct than anxiety and depression, their similarities might lead to a misdiagnosis and oversight, consequently leading to erroneous treatments of those who suffer from burnout (Ahola et al., 2005; Koutsimani et al., 2019). Studies have showed that those experiencing burnout are more at risk to develop obesity (Ahola et al., 2012), cardiovascular diseases, gastrointestinal and musculoskeletal disorders (Salvagioni, et al., 2017), and insomnia (Brand et al., 2010). Therefore, this is a problem

which consequences affect not only the individual but also his personal relationships as well as professional life (Queirós et al., 2014).

Even though there exist several burnout assessment tools there is only one instrument that assesses all three of the core dimensions of burnout, the Maslach Burnout Inventory (MBI; Maslach, et al., 1996; Maslach et al., 2001). Currently, there are three versions of the tool, one designed specifically for individuals working in human services and health care, another oriented for people working within the educational environment, and finally, a general survey that allows to evaluate these dimensions in non-people focused occupations (Maslach et al., 2001). Other instruments such as the one used in this study, the Oldenburg Burnout Inventory (OLBI, Halbesleben & Demerouti, 2005) measure two of the main dimensions: emotional exhaustion and disengagement.

Burnout is viewed as a process that happens gradually overtime and it does not resume to a specific event or situation. Furthermore, there still is not a consensual framework of how this process unravels itself, some authors believe that it starts with exhaustion, eventually leading to depersonalisation, culminating finally in the decrease in self-efficiency (Maslach et al., 2001). Others believe it to start with depersonalisation blaming certain individuals for his discomfort, thus causing exhaustion due to a feeling of incompetence (Golembiewski, et al., 1986). This lack of consensus on how it occurs as well as lack of knowledge about the level of incidence and associated costs makes it more difficult to determine a proper diagnosis and treatment (Queirós et al., 2014). Studies in the Netherlands (Hooftman et al., 2017) and in Portugal (Cunha et al., 2014) show an increase in individuals affected by burnout in the last few years.

Demographically burnout tends to be higher among younger employees, unmarried individuals and in those with higher levels of education. This last one could be related to the fact that those with higher education tend to have bigger responsibilities and deal with more stress, or that these people have set higher expectations professionally that are not being met. Another thing to consider is that it is possible that those affected early on in their careers by burnout are no longer in their jobs and, therefore, the respondents are the survivors, hence possibly presenting lower levels of burnout (Maslach et al., 2001).

Situational factors related to work such as type of profession, years of job experience, complexity and quantity of tasks, lack of career progression, long working hours, and a sense of injustice contribute to higher levels of burnout. Additionally, the physical environment, the level of bureaucracy, rewards, prestige and change in company policy may contribute

equally to the development of this phenomenon (Queirós et al., 2014). Also, Alarcon and colleagues (2009) found that certain characteristics of one's personality such self-esteem, general self-efficacy, internal locus of control, emotional stability, extraversion, conscientiousness, agreeableness, positive affectivity, negatively affectivity, optimism, and proactive personality are related to burnout. Finally, research suggests that emotional exhaustion and depersonalization is related to an emotion-focused type of coping strategy, while diminished personal accomplishment is related to problem-focused coping (Shin, et al. 2014).

1.2. Job Demand-Resources Model

The Job Demand-Resources (JD-R) model argues that there are particular risk factors associated with job-related stress in all activities (Demerouti, et al., 2001; Demerouti & Bakker, 2011). These risk factors can be divided in two main categories (i.e., job demands and job resources), which can vary accordingly with the specific characteristics of one's occupation (Demerouti & Bakker, 2011). In the past couple of decades the research on the Job Demand-Resources model has increased, showing its ability to predict burnout (Demerouti et al., 2001), organizational commitment, task enjoyment (Bakker, et al., 2010) and work engagement (Bakker et al., 2007).

Job demands relate to all the aspects (e.g., physical, social, psychological or organisational) of work that involve the continuous use of cognitive and/or emotional effort and, therefore, have a certain degree of psychological and/or physical cost (e.g., workload, time pressures, irregular working hours, conflict with others, job security; Demerouti et al., 2001; Demerouti & Bakker, 2011; Schaufeli, 2017). The higher the level of activity, the greater the cost (Demerouti et al., 2001). These demands are not automatically negative, since they only become job stressors when the workload surpasses the capacity of the individual to handle and recover from the effort (Colombo & Cifre, 2012; Maslach & Leiter, 2016; Meijman & Mulder, 1998). Therefore, they could be interpreted as triggers of a deterioration of the individuals health when a job with chronic job demands drains the person's emotional and physical resources (Demerouti & Bakker, 2011). This process leads the individual to use strategies to protect himself, but that too can have similar consequences over long periods of time (Hocke, 1993; Demerouti & Bakker, 2011; Demerouti, et al., 2001).

Job resources refers to sources of motivation for one's job, whether by allowing to achieve work goals, reduce the cost of job demands or by stimulating the personal growth and the development of the employee, hence playing either an intrinsic or extrinsic motivational role in this process (Demerouti et al., 2001: Demerouti & Bakker, 2011). Different types of resources can be found on different levels, for example on an organisational level it involves topics such as control over one's job, participation in the decision-making process as well as task variety. On the other hand, the social level refers to the support from others, such as family, colleagues, and peers (Schaufeli, 2017). When these external resources are lacking, the individual cannot handle the negative influence of the demands (Demerouti et al., 2001).

Although job demands and resources may be found in every type of professional activity, the degree to which they're present may vary, while some are specific to certain jobs. For example while physical demands are extremely relevant for garbage collector, cognitive demands are more important to an accountant (Bakker & Demerouti, 2014). Moreover, in moments when job demands seem to be high, job resources can be particularly useful, acting as buffers, and influence work engagement and motivation (Bakker, et al., 2014; Bakker & Demerouti, 2007, 2008, 2014; Crawford, et al., 2010; Demerouti & Bakker, 2011). Bakker and colleagues (2007) found that, in the context of Finnish teachers, in high demanding job circumstances, job resources are extremely helpful in sustaining work engagement. Furthermore, personal resources can also somewhat regulate this relationship and develop themselves through job resources (Demerouti & Bakker, 2011).

1.3. Burnout and Job Demand-Resources

Since burnout is particular to the work context, it becomes necessary to consider situational factors, such as job, occupational and organisational characteristics, in its development. Research has supported that workload and time restrictions are strongly associated to burnout, which promotes the idea that it is a response to overload. Job demands such as role conflict (i.e., contradictory needs at one's job must be answered) and role ambiguity (i.e., an inadequate amount of information is available to perform one's job well) have consistently presented a solid correlation with burnout. Additionally, lack of job resources such as reduced participation in decision making, feedback and social support, namely from supervisors and work colleagues, have also been linked to burnout (Bakker, et al., 2014; Gauche et al., 2017; Maslach et al., 2001; Maslach & Leiter, 2016).

It is important to keep in mind that since this is an occupational phenomenon, it is not only subjected to the pressures of the organization and its' hierarchies, rules and assets but it is also exposed to the current social, cultural and economic situation/circumstances. This in turn increases the demands of working individuals with more time pressure and requiring a wider range of skills and flexibility while receiving less benefits from the labour markets, reducing job opportunities and job security. This dynamic can very easily violate the psychological contract that it is produced and disregard one's basic assumption of equity and justice (Maslach et al, 2001).

In 2001, Demerouti and colleagues, proposed the JD-R model, assuming burnout occurs when there is a clear discrepancy between the level of job demands and its resources. Thus, when job demands are immense and job resources are scarce resulting from unfavourable working conditions, it leads to a decrease in employees' motivation due to being in a state of exhaustion. This reasoning can be applied to any given type of occupation. Job demands have been identified as the main contributors to burnout, while job resources have been identified as the main sources of work engagement (Bakker, et al., 2014). Additionally, the theory supports the idea that individuals suffering from burnout may end up creating more job demands for themselves, while motivated individuals are able to mobilize their own job resources to stay engaged (Bakker & Demerouti, 2014).

According to this model, burnout can, therefore, develop through two different processes. The first defends that extreme job demands in various aspects of one's work can cause exhaustion. The second process argues that inadequacy or shortage of resources does not allow the employee to fulfil job demands properly, subsequently leading to a disinvestment in one's work (Demerouti, et al., 2001). In jobs where there's high job demands but reduced job resources, individuals are more likely to feel both exhaustion and disengagement leading to negative outcomes such as poor health, performance and work commitment, which in turn may lead to the development of the burnout syndrome (Schaufeli, 2017). Thus, it suggests that the symptoms related to burnout may develop under a specific combination of working conditions. Meanwhile, high job resources might lead to an increase in employee's engagement, which might translate positively to job performance and organizational commitment (Demerouti & Bakker, 2011). Furthermore, job resources were found to lessen burnout (Nahrgang et al., 2010).

1.4. Game developers

Since the 1970's with the development of Pong, the first commercially successful game (Kent, 2001), the game market has grown so much that in 2018 it produced over 131 billion dollars in revenue, and it is expected to reach over 300 billion in 2025 (GlobalData, 2019). The Asia-Pacific region alone was said to reach 52% of the global game earnings, and the prediction is that it will continue to grow throughout the years, with China being the biggest single market in the world, grossing roughly 51 billion dollars by 2021 (Newzoo, 2018). In 2018, Grand Theft Auto V, created by Rockstar Games in 2013, became the most financially successful media product of all time, raising more than six billion dollars in revenue and currently selling over 110 million copies worldwide (The UK Interactive Entertainment Association, 2018; Valentine, 2019). This, alongside the more fun and creative culture of the game industry creates a stereotype that game developers are paid to play games, hiding the fact that, more often than not, it's a profession marked by intense and precarious working conditions (Bulur, 2015; Peticca-Harris, et al., 2015; Weststar, et al., 2019).

According McGuire and Jenkins (2008), a *game developer* is someone who takes part in the production of a game, working on its mechanics (i.e., gameplay), content (e.g., art, music, storytelling) and technology (e.g., software), and can, therefore, integrate the art, design, programming, writing, quality assurance, or sound design teams. This could be done by only one person or a team of two, or up to hundreds. It is often the case that teams share certain responsibilities and, in some instances, it is also possible that one person can also be a part of two teams depending on the project and the size of the company. The authors emphasize that games are art as well as science, and as such a game developer must also be a multidisciplinary professional to meet job requirements. Video game development is not an easy task, therefore it requires multidisciplinary teams or individuals, and might even include producers, managers, and voice actors.

Regarding employment, according to the International Game Developers Association (IGDA, Weststar, et al., 2019) 74% are employed, 15% work freelance and 11% are self-employed. In 2019 data showed the average tenure is only 2.2 years for employed individuals (Weststar, et al., 2019), this is due to being a project-based type of work, each game is therefore divided in three major stages requiring very different resources: pre-production; production; and post-production (Weststar, 2015). No project resembles any other, and so planning can only occur to a certain extent, and even then, it is bound to suffer

several modifications overtime. As a result, workers must be able to manage their own working time and adapt to change quickly to meet the previously determined milestones (Teipen, 2008). Hence, in addition to being a precarious type of project-based work, engaging in cycles of hiring, firing and reallocation depending on the stages of the projects, the worker is tasked to complete the project accordingly to the clients' satisfaction by any means necessary.

In 2004, a disgruntled wife felt compelled to share with the world a blog post denouncing the working conditions at Electronic Arts (EA), revealing that its workers were facing constant crunch, being required to work up to 90 hours per week. These long hours eventually started taking their toll on the employees, allowing them to be less effective while doing their jobs, deteriorating their health and, in many cases, leading them to even abandon their jobs (Ea-spouse, 2004). A similar situation was also reported back in 2010 by another group of concerned wives about the working conditions in Rockstar San Diego stating, once more, that it became mandatory for its employees to work up to 12 hours, six days a week, while being stripped of their previous benefits (e.g., overtime payment, vacation days) and made to work harder. So much so, that some employees started to experience hindering health issues (e.g., depression; Rockstar Spouse, 2010). Now multiple cases have been made public about the abuse and expectations within the industry neglecting workers health and safety, and in extreme cases human rights, in order to meet deadlines and sell the product.

In 2015, Konami, a major Japanese entertainment company, was reportedly said to been monitoring employees' movements with cameras, taking particular interest in how long they would take for lunch, those who took too long were publicly shamed within the company. Also, those deemed "useless" were moved from game development to work in pachi-slots factories or even security guards or janitors. This would affect both junior and senior staff (Tassi, 2015). In 2019, 150 workers took part in a protest at Riot Games with the objective to end the inclusion and enforcement of forced arbitration clauses in company's contracts. This followed a series of reports about the toxic behaviours in the workplace, gender discrimination lawsuits from various employees, as well as the placement of a motion to oblige some of the women suing the company into settling the matter in private arbitration. This walkout ultimately led Riot Games to give new employees the option to opt out of the mandatory arbitration clause in relation to sexual harassment and assault claims (McAloon, 2019).

In 2020, wage disparities and executive compensation became the reason for discontent among employees at Blizzard Entertainment. This happened in the wake of budget cuts and layoffs the previous year, leaving the remaining workers taking the responsibilities of those who were let go while not receiving any extra compensation. Some complaint that they were currently making less than a decade ago because they are working less hour's overtime. In contrast the company's CEO, received $40 million in compensation last year. Those who left joined other competitors, which allowed them to have a significant pay increase (Schreier, 2020). These are all examples of established companies that are major players within the video game industry, therefore they set the example for all other companies, and as such have an influence as well as responsibility towards game developers and healthier working environments.

Although most game developers love their work for being highly communicative and allowing them to bring value to society (Bulut, 2015), there has been a growth in reports about long, uncompensated hours under extreme working conditions of "make it or break it". According to the 2019 IGDA survey most game developers work on average 40-44 hours in regular weeks and 50-59 in periods of crunch. As reported by the Game Developers Conference (GDC, 2020), 44% of those surveyed work more than 40 hours a week regularly, while 1% claimed they worked more than 90 hours in a single week in the last year, and five participants said to have worked 120 hours in one given week. A lot of game developers tend to accept this kind of working conditions while still considering their job very positively and viewing crunch as a necessary and normalized condition to game development (Bulut, 2015; Pericca-Harris,et al., 2015; Weststar, 2015; Weststar, et al., 2019). Meanwhile, many workers do not report the toxicity of their workplace because they are afraid to be blacklisted within the industry and be left without a job (Bulur, 2015). Additionally, unpaid and unlimited overtime, poor work-life balance, musculoskeletal disorders, burnout, unsupportive work environment or lacking career and personal development opportunities are all issues that game developers often face in their line of work (Pericca-Harris, et al., 2015). In the 2014 IDGA Developer Satisfaction Survey, 15% of those inquired reported burnout as a reason for wanting to leave the industry, while 39% said they were able to find better quality of living elsewhere (Edwards, et al., 2014). These problems will hinder, in the long run, the quality of the video games produced by these workers, ultimately leading to displeased consumers and a weakened workforce.

This calls for the creation of unions to defend the interests off this occupational group, giving them more collective bargaining power over precarious working conditions. According to the State of the Game Industry Report (Game Developers Conference, 2020), 54% of developers are in favour of unionizing, while only 16% are against, although only 23% thinks it will come to fruition. Nevertheless, working conditions within the industry are improving and much of it is due to the notoriety that these situations are having in news outlets. Also, the socio-political climate, with movement like #MeToo, allows workers to feel more comfortable and supported while speaking out against bigger corporations. Furthermore, these numbers show that this professional group is more aware of the problems underlying the industry and if and how their companies are responding to them. While some companies are listening to the complaints, changing, and revising their policies, it is important to hold accountable those with more impact for social change, helping to produce more sustainable and healthier workplaces and workers.

Thus, job demands and burnout, as well as job resources, are important topics to study in game developers.

2. METHOD

To identify burnout and job demand-resources levels among game developers, their relationship and variation according to social individual and labour characteristics, a cross-sectional study was designed.

2.1. Participants

This study was conducted using a snowball sample of game developers. The total sample composed of 193 participants was obtained through the Portuguese and English version of the survey. They were mainly Portuguese (46%), British (9%), American (8%). Most of the participants identify themselves as male (78%), 20% as female and 2% as other, with ages ranging between 18 and 62 years old (M=29.56, SD=7.21; Table 1). Most of them were single, divorced, or widowed (56%), whereas 44% were married or partnered. Their years of experience in the game industry vary between 0 and 35 years (M=6.54, SD=6.21), spending from 0 up to a 100 hours a week working (M=40.44, SD=14.61) on their job (Table 2). Regarding current employment status 64% were employed, 18% self-employed, 11% unemployed and 7% were freelancing. The majority of the participants were working in small companies with 10 or less people (37%), 37% were working at companies with more than 100 people, 21% in a company that employs between 10 and 50 people, and 5% in a company that employees between 51 and 100 people. In addition, their time in the current company ranged between one week and 15 years (M=2.65, SD=2.77).

Table 1. Social individual and labour characterization of the sample

Variables	Groups	N	%
	Female	39	20
Sex	Male	150	78
	Other	4	2
Civil status	Married or partnered	85	44
	Single, divorced, or widowed	108	56
	Employed	123	64
	Self-employed	34	18
Employment status	Unemployed	22	11
	Freelancer	14	7

Variables	Groups	N	%
	≤ 10	62	37
	10-50	34	21
Company dimension	51-100	9	5
	≥ 101	61	37

Table 2. Mean and standard deviation of age, experience in the industry, average working hours per week and time in the current company

Variables	Mean	Standard Deviation
Age	29.56	7.21
Experience in the industry	6.54	6.21
Average working hours per week	40.44	14.61
Time in the current company	2.65	2.77

2.2. Materials

The participants were asked to fill anonymously, either in the Portuguese or in English version, a sociodemographic questionnaire inquiring about sex, age, civil status, country of origin, residency, country where they were working in, working situation, years of experience in the industry, dimension of the company they're working in, number of hours worked in a week and whether or not they've ever experienced crunch along with the frequency and moments that it happened. This was followed by of the Oldenburg Burnout Inventory (OLBI, Halbesleben & Demerouti, 2005; Sinval et al., 2019), the *Job Demand Scale* (Morin, 2000) and the *Job Resources Scale* (Gonçalves, Neves, & Morin, 2009).

The OLBI has a total of sixteen items scored in a 5-points Likert scale (1= strongly disagree and 5= strongly agree) and divided into two dimensions: exhaustion (work overload along with a sentiment of physical, emotional, and cognitive depletion), and disengagement (negative and cynical behaviours and distancing towards one's job), both indicating that higher scores implies higher burnout levels. The Job Demand Scale includes 28 items scored in a 4-point Likert scale (1= almost never and 4=almost always) split into five dimensions: time demands, mental and concentration demands, physical demands, emotional demands and lack of support, material demands and role ambiguity. The Job Resources Scale has a total of 31 items scored in a 6-point Likert scale (1= strongly disagree and 6=strongly agree)

that divide into five dimensions: personal development, social utility of work, ethical, autonomy and quality of personal relations.

Both the Job Demand Scale and the Job Resources Scale were translated to English by a translation team. After agreeing on the best translation, both scales were independently back translated by an additional individual into the original language. In addition, the back translation was then compared to the original in order to guarantee linguistic correspondence. This process was repeated until an agreement was reached about the correspondence (International Test Commission, 2017).

2.3. Procedure

The data was obtained through an online form, either in Portuguese or in English, shared within the online game development community. Participation was fully anonymous and voluntary. It was also solicited the collaboration of associations as well as newly formed unions such as Game Workers Unite UK and Game Makers of Finland in sharing the questionnaire with game developers. Data collection occurred between February of 2019 and June of 2020, taking a total of 16 months.

All data collected was processed using the 26th version of SPSS (*Statistical Package for the Social Sciences*), by employing descriptive analysis, T-test for independent samples, Pearson's R Correlation Coefficient and Multiple Regressions using Enter and Stepwise models.

3. RESULTS

A descriptive analysis sorted by dimensions reveals, in relation to burnout, moderate levels of both exhaustion and disengagement. It also shows high levels of mental and concentration demands and moderate levels of time, emotional, material, and physical demands. Regarding job resources the results reveal high levels of autonomy and moderate values of personal development, social utility of work, ethical, and quality of personal relations (Table 3).

Table 3. Descriptive analysis of burnout, job demand and job resources' dimensions

Dimensions (range)	Minimum	Maximum	Mean	Standard Deviation
Exhaustion (1-5)	1,00	4,63	2,91	,768
Disengagement	1,00	4,50	2,51	,696
Time demands (1-4)	1,17	3,83	2,27	,607
Mental and concentration demands	1,71	4,00	3,09	,522
Lack of support, material demands and role ambiguity	1,17	3,50	1,98	,414
Physical demands	1,00	3,50	1,62	,498
Emotional demands	1,00	4,0	2,17	,610
Personal development (1-6)	1,40	6,00	4,89	,881
Social utility of work	1,00	6,00	4,26	,943
Ethical	1,00	6,00	4,76	1,305
Autonomy	1,25	6,00	5,02	,924
Quality of personal relations	2,00	6,00	4,87	,878

Results also revealed that 85% of the participants report that they have already experienced crunch time at least at one point during their careers. Of these, 84% reported no intention of leaving the industry in the foreseeable future, 10% reported that they had an intention of leaving now or soon and 10% were unsure of their stay in the industry.

Comparative analysis considering sociodemographic variables revealed statistically significant differences (Table 4) according to sex, civil status, nationality, years of experience and the experience of crunch time. Thus, women in the industry tend to

experience higher levels of emotional demands than men, and although not statistically significant women present higher levels of exhaustion and men have higher levels of disinvestment. Married or partnered individuals experience higher mental and concentration, and emotional demands than single, divorced, or widowed participants. Non-Portuguese individuals reported higher levels of mental and concentration, and emotional demands in comparison to Portuguese individuals. Participants with six or more years (senior) of experience report more time, and mental and concentration demands than those with less experience. Finally, those that have reported having gone through crunch time during their career, experience higher levels of time, mental and concentration, and emotional demands and experience lower levels of ethical resources.

Table 4. Comparative analysis of burnout, job demand and job resources according sociodemographic characteristics

	Female N= 39	Male N= 150	t student	p
Emotional demands	2,4974	2,0693	-4,054	,000***
	Marriend or Partnered N= 85	Single, divorced or widowed N= 108	t student	p
Mental and concentration demands	3,2269	2,9894	3,278	,001**
Emotional demands	2,3765	2,0019	4,433	,000***
	Non-Portuguese N= 105	Portuguese N= 88	t student	p
Mental and concentration demands	3,2041	2,9627	-3,240	,001**
Emotional demands	2,3181	1,9864	-3,896	,000***
	Senior N= 80	Junior N= 113	t student	p
Time demands	2,3771	2,1947	-2,075	,039*
Mental and concentration demands	3,2232	3,0025	-2,953	,004**
	Crunch yes N= 163	Crunch no N= 30	t student	p
Time demands	2,3241	1,9778	2,930	,004**
Mental and concentration demands	3,1306	2,8952	2,296	,023*
Emotional demands	2,2160	1,9000	2,646	,009**
Ethical	4,6687	5,2667	-3,341	,001**

* p≤ .050 ** p≤ .010 *** p≤.001

The correlation analysis (Table 5) revealed that age, years of experience in the industry, average of working hours per week and time working at the current company present a weak positive correlation with mental and concentration demands. In relation to number of workers at the company it presents a weak negative correlation with material demands, hence signifying that the bigger the company the less the individual will experience material demands, functioning as a protective factor in the experience of burnout. Concerning the average of working hours per week, it shows a weak positive correlation with exhaustion, time as well as physical demands, and presents a weak negative correlation with ethical resources. Weak positive correlations were found between the time working at the company and time and physical demands. In relation to burnout, the variable exhaustion correlated positively with job demands and negatively with job resources. The same happens with disengagement, correlating significantly with all job demands and resources variables, except for mental and concentration demands.

Table 5. Pearson correlation between individual characteristics, burnout, job demands and job resources' dimensions

	Age	Experience in the industry	Work hours per week	Experience current company	Number of workers current company	1	2	3	4	5	6	7	8	9	10	11
1.Exhaustion	-,033	-,020	,189*	,084	-,072											
2.Disengagement	-,080	-,032	,095	-,017	,031	,697**										
3.Time demands	,022	,068	,253**	,188*	-,054	,469**	,254**									
4.Mental and concentration demands	,199**	,148*	,211**	,241**	-,039	,303**	,046	,486**								
5.Material demands	-,021	-,060	-,096	-,016	-,187*	,322**	,236**	,175*	,236**							
6.Physical demands	,029	,063	,247**	,194*	-,114	,503**	,322**	,450**	,465**	,314**						
7.Emotional demands	,087	,049	,121	,079	,011	,282**	,185**	,405**	,510**	,322**	,427**					
8.Personal development	,009	-,036	-,042	,029	-,142	-,491**	-,729**	-,197**	,066	-,118	-,264**	-,148*				
9.Social utility of work	-,001	,024	-,124	,027	-,073	-,267**	-,439**	-,099	,054	-,125	-,122	-,088	,469**			
10.Ethical	-,073	-,051	-,186*	,013	-,135	-,414**	-,550**	-,282**	-,044	-,168*	-,359**	-,271**	,617**	,310**		
11.Autonomy	-,077	,022	-,049	,085	-,075	-,404**	-,539**	-,214**	-,011	-,107	-,257**	-,202**	,764**	,305**	,567**	
12.Quality of personal relations	,055	-,005	-,111	-,119	,095	-,291**	-,356**	-,106	-,055	-,225**	-,281*	-,150*	,358**	,369**	,371**	,274*

*p < 0.050 ** p < 0.010

We executed a multiple regression analyses, utilizing the enter method, to understand the predictive value of sociodemographic and work variables as well as work demands and wok resources (Table 6). Thus, we were able to determine that work demands explain 32% and work resources explain 16% of exhaustion. In relation to disengagement, work demands explain only 12% while work resources explain 50% of this dimension.

Table 6. Multiple Regression (enter method) for burnout's predictors

Dimensions	Predictor	R^2	R^2 change	F	p
Exhaustion	Sociodemographic variables	,026	,026	1,222	,304
	Work Variables	,066	,039	1,371	,247
	Work Demands	,384	,318	13,023	,000***
	Work Resources	,541	,157	8,296	,000***
Disengagement	Sociodemographic variables	,030	,030	1,386	,250
	Work Variables	,039	,009	,309	,872
	Work Demands	,158	,119	3,554	,005**
	Work Resources	,656	,498	34,982	,000***

* p≤ .050 ** p≤ .010 *** p≤.001

Using a multiple regression with the stepwise method (Table 7) we analysed the contribution of specific variables, verifying that time demands are associated with higher levels of exhaustion, explaining a total of 27% of this dimension. Personal development is associated with lower levels of both exhaustion and disengagement, explain 14% and 51% respectively.

Table 7. Multiple Regression (stepwise method) for burnout's predictors

Dimensions	Predictor		R^2	R^2 change	β	t	F	P
Exhaustion	Work Demands	Time Demands	,270	,270	,244	3,323	50,638	,001**
		Material Demands	,329	,059	,269	3,948	12,056	,000***
		Physical Demands	,366	,037	,191	2,928	7,814	,004**
	Work Resources	Personal Development	,502	,136	-,380	-6.048	36,576	,000***
Disengagement	Work Demands	Physical Demands	,093	,093	,090	1,609	14,104	,110
	Work Resources	Personal Development	,607	,514	-,634	-9,695	177,716	,000***
		Ethical	,629	,022	-,190	-2,805	7,870	,006**

* p≤ .050 ** p≤ .010 *** p≤.001

4. DISCUSSION

Although we were able to find moderate levels of both exhaustion and depersonalization, these may not realistically represent the degree to which burnout is experienced in the industry. In fact, due to the healthy worker effect, individuals who suffer from stronger levels of burnout may no longer be able or willing to participate in studies (Chowdhury et al., 2017). Moreover, workers affected early on in their careers by burnout are no longer in their jobs, suggesting that the respondents are the survivors, hence presenting lower levels of burnout than expected (Maslach et al., 2001). Finally, the moderate levels of job resources alongside their passion for their job can function as a protective effect, mitigating the development of burnout (Demerouti & Bakker, 2011).

The underrepresentation of women in the industry may help explain why they experience higher levels of emotional demands (Weststar, 2015). Additionally, the majority represent roles within art, project management and non-development (e.g., management, marketing, human resources; Harvey & Fisher, 2014), which due to the specifications of the job might require more emotional demands. Results regarding the civil status may be due to a work-family conflict, allowing the individual to feel a higher level of emotional and mental demands while trying to balance both aspects his life (Peticca-Harris, et al., 2015).

The fact that non-Portuguese nationals experience higher levels of mental and emotional demands might be related with both the competitiveness of the industry and labour market internationally. Therefore, non-Portuguese individuals have more contact with bigger companies with recognized brands and franchises, as such they participate in more noticeable projects with more responsibility, changes, and tighter deadlines.

Also, data shows that individuals with higher levels of experience in the industry encounter a higher degree of time and mental demands. This might be related to the underlying requirements of their position: doing more demanding tasks, needing a wider skillset, acquired responsibilities, coordinating, and supervising larger teams. Thus, their time is mostly spent overseeing the work of others and less on executing other important tasks. The experience of crunch shows that working conditions with extreme job demands can very easily take toll on individuals, which in turn may lead to the development of burnout. The impact that crunch can have in these professionals, along with the many job demands that they must fulfil, may lead to the loss of valuable insight and experience that these professionals bring to the table. Those with longer careers and with families are no longer willing to spend weeks or months working overtime, sacrificing other aspects of their

lives, risking their health and personal relation in order to meet deadlines, while having little to none compensation (Teipen, 2008).

Additionally, the lower levels of ethical resources in those that have experienced burnout demonstrate a violation of the psychological contract and disrespect of equity and justice (Maslach, et al., 2001). Furthermore, the fact that time demands explain 27% of exhaustion displays the risk that crunch presents to the occurrence of burnout, while personal development functions as a protective factor to its occurrence, positively affecting one's work engagement (Demerouti, et al., 2001; Maslach & Leiter, 2016; Xanthopoulou, et al., 2007). Teipen (2008) supports this last part, stating that professional as well as personal development seem to have more positive impact in game developer's motivation than from financial incentives.

5. CONCLUSIONS

Despite being an exploratory and cross-sectional study, with voluntary participation, the results show that this professional group is often subjected to intense working conditions, with a high level of demands that they struggle to meet, leading to job turnover and health concerns, both physically and mentally. Fortunately, these concerns have started being addressed by the newly created unions, as well as news outlets for the past couple of years, making companies revise and change their policies. However, despite all these efforts, crunch still is prevalent issue.

This study can contribute to help identify the risk of burnout within the game industry, alerting for the need to prevent and even reduce this occupational phenomenon, such as EUROFOUND already suggested in 2018 (EUROFOUND, 2018). Furthermore, key personal resources like emotional intelligence and proactive personality may help employees to recognize and regulate their fatigue in an effective way.

There are several types of intervention strategies that can be used in order to treat and/or prevent burnout. Most discussions usually focus on solutions centred on the individual, emphasizing, and encouraging the creation and development of one's coping mechanisms to deal with exhaustion. These can help mitigate the symptoms but since there is no real control over the stressors present in the workplace it tends to be rather feeble, especially when it comes to one's feelings of inefficacy and cynicism. Meanwhile, a combined effort of an intervention that produces changes in the way the organization functions as well as educating its individuals to increase their coping skills is much more efficient. For example, altering human resource practices and promoting a healthy leadership may help their short-term fatigue and avoid enduring burnout as well as allow the growth of engagement with one's work and with the organization itself (Bakker & de Vries, 2020). Additionally, it is also important to keep in mind that these interventions, although essential to reduce burnout, are quite complex and therefore hard to implement due to the time, effort and money that they require (Maslach et al, 2001). This often times causes much resistance from the organization and some individuals, preventing the application of these methods and maintaining less friendly work conditions. Nonetheless, intervention should be designed and adapted accordingly to the context, identifying job demands which have more impact on exhaustion, and work towards their reduction, while promoting job resources that increase workers' engagement, which leads to a reduction of both exhaustion and disengagement,

and could lead to an improved, healthier, safer, and happier workplace (Bakker & Demerouti, 2018; Bakker, et al 2014; Maslach & Leiter, 2016).

The fact that this is a relatively new occupation, often glamorized by the industry itself, explains the lack of research regarding these professionals, their working conditions, and the experience of burnout. Nonetheless, we hope that the interesting results presented in this study will instigate more research on the subject. Future research should analyse whether there is a protective effect of personal resources, namely against crunch. It should also consider other protective or hindering variables such as job satisfaction, coping strategies, work-family conflict. Additionally, it would be relevant to do a qualitative study, providing a in-depth understanding of the reasons and frequency of crunch as well as whether the experience differs especially regarding to the dimension of the company and the type of job performed in game development (i.e. art, quality assurance, game design, management).

In sum, a good work environment is more than just preventing workers from getting stressed or ill, it also promotes their general wellbeing. Therefore, it is important to initiate a debate about the psychological wellbeing in the workplace, between workers, organizations, policy makers and social partners, allowing it to be in equal footing with the physical working environment (EUROFOUND, 2018). When promoting workers wellbeing we're also encouraging job satisfaction, commitment, engagement, as well as increasing their sense of purpose and intention to stay in the company, allowing them to contribute more to its success (EUOSHA, 2018). Thus, taking preventive actions such as awareness-raising campaigns, training (e.g. in stress management, Gauche et al. 2017), more healthy work practices, caring out risk assessment on stress and burnout are all small but important steps for the sustainability of the workforce in the game industry.

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