



The impact of COVID-19 pandemic context on work motivation: a two-wave study

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Abstract

During the COVID-19 pandemic, organisations globally shifted into an emergency mode, leading to significant changes in the labour market. In light of these developments, this study sought to examine how the COVID-19 pandemic context influenced employees' evaluations of the different states of work motivation, as outlined in the framework of the Self-Determination Theory. A sample of 243 Portuguese employees completed the Multidimensional Work Motivation Scale (MWMS) at two-time points (before and during the pandemic). Repeated-measures univariate and multivariate analyses of variance (MANOVA) were used to examine differences in work motivation scores between Time 1 and Time 2, as well to analyse the interaction between time and sociodemographic and work-related variables in the same dimensions. The results showed a positive and significant effect of the COVID-19 pandemic context on the more autonomous states of work motivation, i.e., Identified Regulation and Intrinsic Motivation, and those related to the controlled states of motivation, mainly Extrinsic Material Regulation and Introjected Regulation. In addition, workers without higher education have benefited more in terms of identified regulation throughout the pandemic, suggesting that the pandemic context may have facilitated the internalisation of new values and meaning at work for this group. This two-wave study suggests that the pandemic context acts as a psychological determinant affecting how job resources contribute to fulfilling autonomous motivation. The internal factors driving employees' autonomous motivation are shaped by their perception of the job resources within the wider context. In times of crisis, it is vital to focus on work resources and psychological needs to maintain employee motivation. Organisations must adjust their strategies to offer adequate support and balance demands and resources, especially during crises such as the pandemic.

Keywords COVID-19 · Pandemic context · Work motivation · Self-determination theory

Introduction

The COVID-19 pandemic has brought unprecedented changes to the world of work, forcing organisations globally to adopt emergency modes and significantly alter their

operations, and consequently employees found themselves operating within a modified work environment (Akay et al., 2023; Biron et al., 2010; Meseguer de Pedro et al., 2021; Pfefferbaum & North, 2020; Rivera Rivera et al., 2021; Vieira et al., 2021). Social distancing measures and mobility

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restrictions have imposed the need to move to teleworking, redefining the way employees interact and carry out their tasks (Biron et al., 2021). In addition, the pandemic has accelerated the adoption of digital technologies and new management practices, changing the structure and dynamics of work teams (Waizenegger et al., 2020). The implementation of health safety policies, such as the use of masks and frequent sanitisation, has become a priority, directly impacting the physical and psychological environment of employees (Brooks et al., 2020). The crisis has also caused both employers and employees to re-evaluate their values and priorities, influencing perceptions of job stability, financial security and personal well-being (Carnevale & Hatak, 2020). Recent studies indicate that these changes have not only affected working practices, but also worker motivation and engagement, crucial aspects for organisational performance (Spurk & Straub, 2020; Xiao et al., 2021). This comprehensive overview sets the stage for understanding the critical need to analyse work motivation during these unprecedented times.

The existing literature on work motivation has been largely influenced by Self-Determination Theory (SDT), which distinguishes between different types of motivation, from the more self-determined, such as intrinsic motivation, to the more controlled, such as extrinsic motivation (Deci & Ryan, 2000). During periods of crisis, the interest in work motivation becomes more critical because it is directly related to the security needed by employees in such periods (Hitka et al., 2015) and it is an important element conducive to achieving the organisation's goals (Christensen et al., 2017). Previous studies have shown that intrinsic motivation is associated with better outcomes at work, including greater satisfaction, performance and well-being (Gagné et al., 2015). Early research indicated changes in employees' motivation, with some studies reporting an increase in self-determined motivation due to greater autonomy in teleworking (Biron et al., 2021). On the other hand, Toscano and Zappalà (2020) found that social isolation and increased stress contributed to a decrease in extrinsic motivation, negatively affecting performance and job satisfaction. Additional studies have highlighted that flexibility and organisational support play a crucial role in maintaining motivation during crises (Carnevale & Hatak, 2020). Trougakos et al. (2020) noted that health-related anxiety during the pandemic can reduce motivation and increase emotional exhaustion. Although these studies offer valuable information, there is a need to better understand how different types of motivation evolve over time, especially in diverse work environments.

Despite advances in understanding work motivation during the pandemic, there are still areas that need further exploration. One significant gap is the lack of longitudinal

studies investigating changes in motivation over time, specifically before and during the pandemic. Many existing studies are cross-sectional, providing only a snapshot of employees' perceptions at a single point in time, which limits understanding of the dynamics and processes of change in motivation. In addition, most research has focussed on specific contexts, such as health or technology sectors, leaving a gap in understanding the experiences of different populations of employees, such as those in less explored sectors (Gagné et al., 2015). Furthermore, the interaction between various dimensions of motivation—both self-determined and controlled—in different crisis contexts remains little explored (Ryan & Deci, 2020). Thus, the aim of this study is to examine how the context of the COVID-19 pandemic has influenced employees' assessments of different states of motivation at work, as outlined by Self-Determination Theory. Using a sample of 243 Portuguese employees, the study measured motivation at work at two points in time: before and during the pandemic. This approach will help elucidate the dynamic nature of work motivation in response to significant contextual changes.

Based on the idea that a continual process for work motivation must be developed and adopted (Alfalih, 2021), this paper tries to understand the role of contextual variations in each dimension of work motivation (Van den Broeck et al., 2021a, 2021b). In particular, shed light on the dynamics of change in work motivation among Portuguese employees in times of crisis. The research, with a diverse sample of employees from various sectors, offers a comprehensive view of motivational experiences during the pandemic and provides insights into how different states of motivation are affected in crisis contexts. This study offers a distinctive and valuable perspective on comprehending the significance of objective changes within the framework of employees' subjective perceptions. In addition, considering the COVID-19 pandemic as the greatest challenge of this era (ONU News, 2020), this study addresses a historical moment with an assessment of before and during the COVID-19 pandemic. Theoretically, the study can shed light on employees' resilience and adaptability, providing insights into the applicability of Self-Determination Theory in situations of adversity and drastic change (Vansteenkiste et al., 2020; Ryan & Deci, 2020; Gagné & Deci, 2005). From a practical point of view, the results can inform human resource management policies by providing guidance on how to support and sustain employee motivation during periods of uncertainty and transition (Schaufeli, 2017). By identifying the factors that promote or hinder motivation in times of crisis, organisations can develop more effective strategies to maintain the morale and productivity of their employees (Meyer et al., 2021). This knowledge is crucial for designing interventions that can help organisations cope better with future crises.

This paper is organised as follows: the next section presents a detailed review of the literature on work motivation and the development of the study's hypotheses. Next, the methodology used in the study is described in detail, including the study design, the sample and the methods of analysis. The results of the study are then presented and discussed, with a focus on the practical and theoretical implications of the findings. Finally, the conclusions are presented, highlighting the limitations of the study and suggestions for future research.

Literature review and hypotheses

The Self-Determination Theory (SDT) is a broad theory of human motivation that presents one of the most comprehensive perspectives on the complexities of human motivation (Deci et al., 2017; Gagné et al., 2018a, 2018b; Kanfer, 2009; Kanfer et al., 2017a, 2017b). According to the theory, autonomous motivation can be fostered by creating opportunities for individuals to satisfy their fundamental psychological needs for autonomy, competence, and relatedness (Ryan & Deci, 2020; Slemp et al., 2021). Fulfilling these basic psychological needs is crucial to promoting healthy motivation, integrative functioning and the pursuit of goals (Ryan et al., 2022).

Self-Determination approach argues that there are six types of work motivation. *Intrinsic motivation* and *Identified regulation* are considered autonomous forms of motivation. *Intrinsic motivation* involves willingly participating in an activity due to its inherent interest or enjoyment (Deci & Ryan, 2000; Gagné & Deci, 2005). *Identified regulation*, on the other hand, entails engaging in an activity because of its perceived personal meaning or value. (Van de Broek et al., 2021). The introjected and external regulations are conceptualised as controlled forms of behavioural regulation.

Introjected regulation involves engaging in an activity under internal pressure, with the aim of experiencing positive feelings such as pride and avoiding negative ones like guilt or shame (Kanfer, 2009; Kanfer et al., 2017a, 2017b). External regulation refers to participating in an activity due to external pressures, solely to receive rewards or avoid punishments from others. These external influences can be either material, known as *Extrinsic Material Regulation*, or social in nature, *Extrinsic Social Regulation* (Deci & Ryan, 2000; Gagné & Deci, 2005). Lastly, *Amotivation* refers to the lack of motivation or intention to engage in a behaviour (Deci & Ryan, 2000; Gagné & Deci, 2005).

Pandemic context and autonomous motivation

Different types of work motivation predict different work outcomes (Ferraro et al., 2018). In environments where

autonomous forms of work motivation predominate, employees are more likely to manifest better psychological health (Dagenais-Desmarais et al., 2018a, 2018b; Ntoumanis et al., 2021), psychological well-being (Howard et al., 2016; Tang et al., 2021), job stability (Purohit et al., 2014), job satisfaction (Deci & Ryan, 2014), and job performance (Baard et al., 2004; Manganelli et al., 2017). On the one hand, by satisfying the intrinsic needs of competence, autonomy and relatedness, self-integrated motives related to money are positively related to well-being. On the other hand, the frustration of the three basic psychological needs leads to a positive relationship between non-integrated money and malaise (Landry et al., 2016).

Various external factors imposed by governments during the pandemic (e.g. physical distancing, prophylactic self-isolation and quarantine) have reduced the possible scope of behaviours that people can perform, which may have deprived them of the satisfaction of basic psychological needs (Šakan et al., 2020; Trougakos et al., 2020). According to the Cognitive Evaluation Theory (Deci & Ryan, 2000; Gagné & Deci, 2005), one of the mini theories of the Self-Determination Approach, the external factors preventing the satisfaction of basic needs decrease intrinsic motivation. The complete quarantine that forced people to stay at home caused lower autonomy and frustration (Calvo et al., 2020). Furthermore, the need for competence could have been affected by the changes in the work environment (e.g., remote work) or even unemployment. As for relatedness satisfaction, staying at home may have increased time with the family but did not allow for closer relationships with others. However, recent studies have shown that the need for competence had the most significant effect on well-being, especially when employees were able to maintain pre-pandemic working conditions (Cantarero et al., 2020a, 2020b; Šakan et al., 2020). In addition, the satisfaction of the need for relatedness depended on the number of days experiencing restrictions, and the need for autonomy was not constant (Cantarero et al., 2020a, 2020b; Šakan et al., 2020).

Based on the job demands and resources model (JD-R) and the SDT postulates, Fernet et al. (2012) suggested that job resources that enable basic psychological needs to be met contribute to optimal motivation. The JD-R theory elucidates how employees use proactive and reactive work actions to impact the demands and resources within their work environment (Bakker et al., 2023a, 2023b). It is likely that when employees take full advantage of work resources and internalise the value of their work, they can use their energy and behaviours constructively, becoming more emotionally connected to their work and, at the same time, less prone to emotional exhaustion (Fernet et al., 2012).

Autonomous motivation not only promotes occupational commitment, but also helps prevent emotional exhaustion. This reasoning aligns with the Conservation of Resources Theory (COR) (Hobfoll & Freedy, 1993), which suggests that people are motivated to acquire, protect, develop and rebuild resources, especially when significant resources are lost or threatened. Although the impact of the pandemic on the labour domain has resulted in high levels of uncertainty, the Portuguese government's rapid responses in managing the pandemic (Ferreira, 2020), coupled with the fact that many labour activities and jobs in various organisations have remained under previously existing conditions, may have triggered gratitude in employees, inspiring a desire to protect and value available resources more highly. As resources became scarcer due to the response to the pandemic, employees may have felt more self-motivated to protect the labour resources that allowed them to satisfy their basic psychological needs. Studies indicate that gratitude and valuing the resources available during the pandemic increased autonomous motivation, promoting greater resilience and adaptation (Di Fabio & Kenny, 2021; Waters, 2020). In addition, Self-Determination Theory suggests that the fulfilment of basic psychological needs is essential for the development of autonomous forms of motivation, which can be crucial in crisis contexts (Deci & Ryan, 2000; Vansteenkiste et al., 2020). Against this backdrop, we hypothesise that:

H1: The pandemic context would positively influence the employees' assessment of autonomous motivation (i.e. Intrinsic Motivation and Identified Regulation).

Pandemic context and controlled motivation

Sources of controlled motivation are identified as the effects of certain stimuli that occur in an individual's environment (Armstrong, 2011a, 2011b). In a turbulent environment, the level of controlled employee motivation is related to economic and social crises. During an economic crisis, external factors related to labour relations, such as team cohesion, work environment, communication and the supervisor's approach, tend to decrease (Závadský et al., 2015). In addition, social isolation reduces the social aspects of work, including interaction with others and the amount of feedback received (Kulikowski et al., 2020; Russo et al., 2021). Confinement and social or physical isolation during significant health crises lead to feelings of boredom, frustration, depression and a sense of detachment from friends and family (Brooks et al., 2020; Russo et al., 2021). In addition, motivational factors such as job stability, basic salary and additional benefits become more critical (Závadský et al.,

2015; Hitka et al., 2021). Consequently, financial difficulties can also contribute to interpersonal pressure and tension.

The frustration of seeking more autonomous engagement can lead employees to pursue need substitutes (Deci & Ryan, 2000; Vander Elst et al., 2012) due to a socio-economic crisis. In this context, employees embrace extrinsic goals, including materialism or popularity, and in doing so can lose touch with what truly promotes growth (Sheldon & Corcoran, 2019). Thus, the instrumental value of the work done is more acute in the ongoing pandemic context. For example, if employees see work-related and health threats occurring during a pandemic, they perceive the risk of job loss and health problems, becoming more attached to work as a protective anchor against the threatening context. In these circumstances, they will focus more on securing the job, the salary and obtaining the approval of important others who can confirm their choice, rather than enjoying the work itself. Recent studies confirm that during crises, controlled motivation can increase due to fear of job loss and financial insecurity (Perry et al., 2020; Van den Broeck et al., 2021a, 2021b). In addition, Self-Determination Theory posits that a lack of fulfilment of basic needs can lead to an increase in controlled motivation, as individuals seek external sources of validation and security (Ryan & Deci, 2017). Organisational uncertainty theory also suggests that in times of crisis, workers may focus more on extrinsic rewards to reduce uncertainty and increase their sense of control (Ashford et al., 1989). Therefore, we hypothesise that:

H2: The pandemic context would positively influence the employees' assessment of the controlled motivation (i.e. introjected and external regulations).

Pandemic context and amotivation

The rapid proliferation of COVID-19 globally has altered prevalent patterns of social interaction and communication (Dagenais-Desmarais et al., 2018a, 2018b). Quarantine measures and social distancing restrictions have increased feelings of loneliness (Ntoumanis et al., 2021), potentially leading to frustration (Tang et al., 2021). Research suggests that frustration is positively associated with amotivation, indicating feelings of discouragement and helplessness (Bartholomew et al., 2011a, 2011b; Haerens et al., 2015; Jang et al., 2016). Therefore, while some employees may find need substitutes, as described above, others may cope with the context by distancing themselves from work and becoming demotivated. Studies have shown that prolonged uncertainty and lack of control over the work environment during the pandemic contributed to higher levels of amotivation among workers (Bliese et al., 2020; Van Hooft & Geurts, 2020). In addition, Cognitive Appraisal Theory

suggests that when basic psychological needs are continually frustrated, individuals may experience a significant decline in motivation to engage in activities, leading to amotivation (Deci & Ryan, 2000). The Resource Adjustment Theory also indicates that the continuous loss of resources without adequate replacement can result in a state of amotivation (Hobfoll, 2001). Thus, we predict that:

H3: The pandemic context would positively influence the employees' assessment of the amotivation.

Method

Participants and procedure

This study was part of a broader research project to promote the alignment of small or medium-sized Portuguese organisations with values through organisational values-based interventions. After conducting seminars with Portuguese organisational leaders in the north and centre of Portugal, seven Portuguese organisations met the eligibility criteria defined by the research team for participation in the project. The seven Portuguese organisations belonged to the construction industry ($n = 16$ participants), manufacture and selling of handmade chocolates ($n = 7$ participants), the industry of manufacturing plastic packaging ($n = 80$ participants), wines production ($n = 29$ participants), production, trade, import and export of horticultural plants ($n = 49$ participants), production and wholesale of dietary and medicinal products ($n = 52$ participants), and the manufacture of metallic products ($n = 10$ participants). Therefore, all of them belong to the primary or secondary economic sectors.

The pandemic context implied an additional moment of data collection during the COVID-19 pandemic. Specifically, participants were assessed in the pre-pandemic context (Time 1, September–October 2019) and during the current pandemic context (Time 2, September–October 2020), and both data collection moments occurred before the change intervention started since the pandemic led to the postponement. A quantitative descriptive two-wave study was carried out. The quantitative method was used to verify to what extent the COVID-19 pandemic context influenced employees' perceptions of work motivation. The outcome variables were the six work motivation dimensions assessed by the Multidimensional Work Motivation Scale (dos Santos et al., 2022; Gagné et al., 2015) described above. Only the 243 participants who responded to both assessment moments were included in this study.

Ethical approval was granted by the Ethics Committee of the hosting institution, and the study received approval from all organizations involved in data collection. Participants

were fully informed about the study and provided written consent, which included detailed information about the project's objectives, participants' rights, voluntary participation, confidentiality of responses, and the research team's commitment. The survey was conducted by a member of the research team (first author), and the organizations allocated a dedicated room for data collection to ensure compliance with physical distancing guidelines set by health authorities.

Measures

Multidimensional work motivation scale

The MWMS (dos Santos et al., 2022; Gagné et al., 2015) is a measure that assesses different types of work motivation according to the self-determination theory. This questionnaire consists of 19 items that assess six dimensions: *Amotivation* (3 items; e.g., 'I do little because I don't think this work is worth putting efforts into'); *Extrinsic Social Regulation* [3 items; e.g., 'To get others' approval (e.g., supervisor, colleagues, family, clients,...)']; *Extrinsic Material Regulation* [3 items; e.g., 'Because others will reward me financially only if I put effort into my job (e.g., employer, supervisor,...)']; *Introjected Regulation* (4 items; e.g., 'Because I have to prove to myself that I can'); *Identified Regulation* (3 items; e.g., 'Because I personally consider it important to put efforts into this job'); and *Intrinsic Motivation* (3 items; e.g., 'Because the work I do is interesting). Response options are on a 7-point Likert-type scale from 1 = 'not at all' to 7 = 'completely'. In this sample, the Cronbach alphas ranged between 0.78 (Extrinsic Material Regulation, Time 2) and 0.96 (Amotivation, Time 2).

Sociodemographic and work-related questionnaire

Sociodemographic and work-related variables were collected using a self-reported questionnaire developed by the authors consisting of 7 questions in time 1 and 9 questions in time 2. The responses to the questions were organised categorically. In Time 1 and 2, the sociodemographic variables assessed were: age, sex, marital status, and educational level. Regarding work-related variables, in times 1 and 2, the questionnaire included questions about the type of contract, seniority in the organisation, and seniority in the job function. In addition, the questionnaire in time 2 also included questions related to the professional situation resulting from the COVID-19 pandemic, specifically the contract situation and the job function.

Table 1 Demographic and work-related characteristics of the sample

	<i>n</i>	%
Sex		
Female	122	50.2
Male	121	49.8
Age		
18–25	24	9.9
26–35	49	20.2
36–45	79	32.5
46–55	65	26.7
+55	26	10.7
Education		
Basic school	45	18.5
Secondary school	97	39.9
Professional studies	29	11.9
University studies	72	29.7
Marital status		
Single	77	31.7
Married	109	44.9
<i>De facto</i> union	24	9.9
Divorced	25	10.3
Widowed	8	3.3
Type of contract		
Permanent	203	83.5
Fixed-term	38	15.6
Training	2	0.8
Seniority in the organisation (years)		
0–5	105	43.2
6–10	29	11.9
11–15	41	16.9
16–20	28	11.5
+21	40	16.5
Seniority in the job function (years)		
0–5	119	49.0
6–10	31	12.8
11–15	30	12.3
16–20	32	13.2
+21	31	12.8

Data analyses

Descriptive statistics were used for the sociodemographic and work-related characteristics of the sample. Repeated-measures univariate and multivariate analyses of variance (MANOVA) were used to explore differences in the dimensions of work motivation between Time 1 and Time 2 scores, as well as to examine the interaction between time and the sociodemographic and work-related variables (as between-subject's factors) in the same dimensions. Analyses were conducted using IBM SPSS Statistics (Version 27). A p -value < 0.05 (two-sided) was set as cut-off for statistically significant differences.

Results

Of the 243 participants who completed the questionnaires at both assessment times, 50.2% were female, 59.2% were aged between 36 and 55 years, 54.8% were in a relationship, 39.9% had a secondary school, and 83.5% reported a permanent job contract. Most participants worked in the organisation and the current job function for under five years. During the pandemic, the contract situation in the organisation remained equal for 236 participants (97.1%) and the job function for 224 participants (92.2%). Thirteen employees (5.2%) reported working from home in Time 2. The detailed demographic and work-related characteristics of the sample can be found in Table 1. The correlations between the dimensions of work motivation before and during the COVID-19 pandemic are presented in Table 2.

Both in Time 1 (before COVID-19) and Time 2 (during the COVID-19 pandemic), the dimension of work motivation that presented the highest score was *Identified Regulation*, and the dimension that presented the lowest score was *Amotivation*. Table 3 shows mean differences (and standard deviations) over time in the dimensions of work motivation.

The results of the repeated-measures multivariate analysis of variance (MANOVA) revealed a significant multivariate effect of time [Pillai's Trace = 0.21, $F(6, 237) = 10.26$;

Table 2 Correlations between study variables before and during COVID-19 pandemic

Motivation	1	2	3	4	5	6
1. Amotivation	.12	.45***	.04	-.09	-.24***	-.19*
2. External Regulation Social	.32***	.12	.40***	.18*	.05	-.02
3. External Regulation Material	.05	.37***	.27***	.41***	.36***	.21**
4. Introjected Regulation	-.05	.32***	.50***	.33***	.66***	.44***
5. Identified Regulation	-.14*	.15*	.42***	.65***	.40***	.70***
6. Intrinsic Motivation	-.04	.29***	.33***	.42***	.70***	.38***

The correlations between the dimensions of work motivation *before* the pandemic (Time 1) are below the diagonal. The correlations between the dimensions of work motivation *during* the pandemic (Time 2) are above the diagonal. The diagonal represent the correlations between the dimensions of work motivation at Time 1 and Time 2

* $p < .05$; ** $p < .01$; *** $p < .001$

Table 3 Comparison of work motivation before and during COVID-19 pandemic

	Before COVID-19	During COVID-19	F	η_p^2
	M (SD)	M (SD)		
Motivation				
Amotivation	1.49 (1.07)	1.62 (1.29)	1.53	.01
Extrinsic Social Regulation	2.81 (1.57)	2.71 (1.67)	0.57	.00
Extrinsic Material Regulation	3.69 (1.69)	4.06 (1.64)	8.39**	.03
Introjected Regulation	4.37 (1.64)	4.95 (1.65)	22.75***	.09
Identified Regulation	5.11 (1.68)	5.67 (1.45)	25.15***	.09
Intrinsic Motivation	4.30 (1.60)	4.99 (1.52)	37.04***	.13

** $p < .01$; *** $p < .001$

$p < 0.001$, $\eta_p^2 = 0.21$]. Subsequent univariate tests indicated significant increases in the dimensions *Extrinsic Material Regulation* ($p = 0.004$), *Introjected Regulation* ($p < 0.001$), *Identified Regulation* ($p < 0.001$), and particularly *Intrinsic Motivation* ($p < 0.001$). No significant changes were obtained both in *Amotivation* and *Extrinsic Social Regulation*. Therefore, H1 was supported since the more autonomous motivation states (*Identified Regulation* and *Intrinsic Motivation*) presented an statistically significant increase from Time 1 to Time 2. Our sample partially corroborated H2 since the *Introjected Regulation* and *Extrinsic Material Regulation* presented an statistically significant increase over time. Hypothesis 3 was not supported since the *Amotivation* did not show a statistically significant increase overtime.

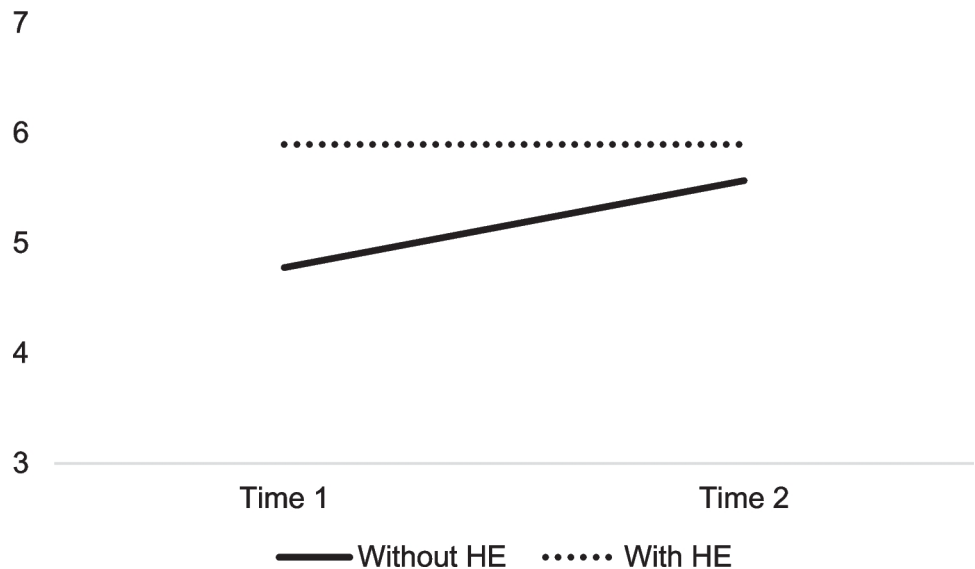
Separate MANOVAs with time and sociodemographic and work-related variables [gender (female vs. male); age (≤ 45 years vs. > 45); education (with vs. without higher education), seniority in the organisation (≤ 5 years vs. > 5 years)

and seniority in the job function (≤ 5 years vs. > 5 years) as the between-subject factors and the dimensions of work motivation as dependent variables were computed. The results did not identify any significant interaction effect between time and gender [Pillai's Trace = 0.02, $F(6,236) = 0.94$, $p = 0.467$, $\eta_p^2 = 0.02$], age [Pillai's Trace = 0.04, $F(6,236) = 1.58$, $p = 0.153$, $\eta_p^2 = 0.04$], seniority in the organisation [Pillai's Trace = 0.04, $F(6,236) = 1.74$, $p = 0.113$, $\eta_p^2 = 0.04$] and seniority in the job function [Pillai's Trace = 0.04, $F(6,236) = 1.47$, $p = 0.191$, $\eta_p^2 = 0.04$]. However, a significant interaction was found between time and education [Pillai's Trace = 0.06, $F(6,236) = 2.49$; $p = 0.024$, $\eta_p^2 = 0.06$]. Subsequent analyses indicated a significant interaction between time and education in identified regulation, $F(6,236) = 11.03$, $p = 0.001$, $\eta_p^2 = 0.04$. The interaction effect showed that the increase in identified regulation from Time 1 to Time 2 was statistically significant for workers without higher education ($p < 0.001$), but not for those with higher education ($p = 1.000$; see Fig. 1).

Discussion

To the best of our knowledge, this is the first study examining the impact of the COVID-19 pandemic context on the assessment made by Portuguese employees regarding the different work motivation states, with an assessment before and during the COVID-19 pandemic, thus addressing a unique historical moment. Our primary and novel findings show a significant increase in the more autonomous motivation states (*Intrinsic Motivation* and *Identified Regulation*). Therefore, H1a is supported. This result can be explained in the light of Self-Determination Theory (Deci & Ryan, 2000), which argues that autonomous motivation is nurtured when individuals experience an environment that fulfils their

Fig. 1 Mean difference in identified regulation by education and time



psychological needs for autonomy, competence and relatedness. The findings suggest that even when the objective work situation stays the same, the changes in the broader context determine the changes in employees' psychological perception regarding work representation to satisfy their needs. During the pandemic, even with the difficulties associated with social isolation, the work situations of the studied organisations and employees remained the same, which may triggered a feeling of greater autonomy over the management of their time, contributing to an increase in *intrinsic motivation*. Despite the increased demands from the broad environment, employees perceive they have resources from their work to face the demands. Employees can also feel that their contribution allows them to enjoy their jobs more, which may explain their increased *Intrinsic Motivation*.

In addition, identified regulation, which involves personal acceptance of the value of the activities carried out, also increased. This phenomenon can be explained by employees' need to find deeper meaning in their work during a period of crisis. Gagné and Deci's (2005) theory suggests that in crisis contexts, people tend to look for ways to stay connected to their internal values, which explains the increase in identified regulation. These employees may appreciate and value their jobs more and feel more identified with their work (Finell & Vainio, 2020). By keeping their jobs, employees can also feel that they are contributing to society and, simultaneously, creating value (for multiple stakeholders). Thus, employees can feel motivated to their work for a community experiencing a health emergency (Bendassolli et al., 2015), since the work gained a higher meaning and its resources are highlighted as a figure instead the ground. Therefore, even in times of adversity, employees may have internalised the meaning of their work, resulting in greater autonomous motivation.

The COR theory (Hobfoll, 1989) offers another perspective: in a crisis environment such as the pandemic, employees may have focused on maintaining the resources that gave them security and well-being. The increase in autonomous motivation may have been a protective mechanism, an attempt to preserve their internal resources, such as control and the ability to manage their time, which gave them a greater sense of competence. According to COR, people try to acquire and conserve resources in times of crisis, and this strengthening of internal resources helped employees maintain or even increase their intrinsic motivation.

Our results also show a significant increase in *Introjected Regulation* and *Extrinsic Material Regulation*. Therefore, H2 is partially supported. This finding is consistent with the literature, which suggests that in times of crisis, people may feel greater pressure to keep their jobs and avoid failure, especially due to economic uncertainty (Perry et al., 2020). An explanation may be employees' gratitude for keeping

their jobs in the previously existing situation, inspiring a desire to reciprocate (Ford et al., 2018). The significant increase in *Extrinsic Material Regulation* (e.g., money) supports the idea that in case of events that negatively impact the socioeconomic context and the labour market, such as that caused by COVID-19 (Pfefferbaum & North, 2020), the aspects related to financial earnings become more critical for employees (Leung & Law, 2019). Financial security may allow employees to pursue their interests and connect with others (Araimi, 2013; Vansteenkiste et al., 2020), especially when contextual autonomy support seems crucial.

Social Exchange Theory (Blau, 1964) and Organisational Uncertainty Theory (Ashford et al., 1989) explain that in times of crisis, such as the pandemic, employees tend to focus more on extrinsic rewards (such as job security and remuneration) and on avoiding losses. The fear of losing their job or facing economic difficulties may have increased internal pressures, leading to an increase in introjected and external regulation.

The COR also helps to understand this increase. When employees face a crisis, such as the pandemic, they may feel that their resources—such as financial stability or job security—are at risk. To avoid losing these resources, they may adjust their behaviour to be more in line with external expectations, which explains the increase in external regulation. According to COR, employees' behaviour would be an attempt to preserve or recover resources that they feel are under threat.

In this study, the pandemic context did not significantly affect the employees' assessment of their *External Social Regulation*. These results differ from our expectations, which could be explained by the fact that despite the pandemic, social restrictions diminished the employees' opportunities to engage with others (e.g., supervisors, colleagues, friends) (Závadský et al., 2015; Kulikowski et al., 2020), their expectation of having external social reward (e.g., compliments) was not affected. Moreover, our results are not in line with previous studies (Desclaux et al., 2017) that suggest that during the pandemic context, relationship factors such as good working teams, communication in the workplace, and atmosphere in the workplace are ceasing to be important.

Hypothesis 3 was not confirmed, as there was no significant increase in amotivation over time. This result can be interpreted in several ways. Firstly, amotivation, which reflects a lack of intention or willingness to act, generally increases when people feel unable to influence the results of their work or when they see no value in the activities they carry out (Deci & Ryan, 2000). However, the results suggest that, despite the difficulties and uncertainties brought on by the pandemic, employees maintained relatively low levels of amotivation.

One possible explanation for this finding could be related to protecting available resources. According to the COR (Hobfoll, 1989), in times of crisis, people seek to protect and value the resources they still have. In the context of this study, many employees may have adopted a mindset of ‘preserving’ their jobs and the value of their work, which helped them avoid demotivation. Instead of feeling demotivated or unable to act, employees may have redoubled their efforts to preserve their jobs and work-related resources, which helped them avoid amotivation. The fear of losing their resources (job, income, security) may have incentivised employees to stay focused and committed, which prevented an increase in amotivation.

COR also suggests that, despite difficulties, employees who perceive that they still have resources to protect or gain, such as professional development opportunities or organisational support, manage to avoid amotivation. This may have been the case, as the study showed that, despite the difficulties, employees maintained levels of autonomous motivation, which probably reduced the possibility of amotivation. In addition, the rapid government support in Portugal, which sought to mitigate the effects of the crisis, may have contributed to employees feeling more secure and less prone to amotivation (Ferreira, 2020).

Another factor to consider is that the continuity of working conditions for most employees, as described in the results, may have played an important role in maintaining low levels of amotivation. Studies indicate that when working conditions remain stable, people tend to feel more in control of their environment, which prevents an increase in amotivation (Bliese et al., 2020).

The results also indicate that there was no significant interaction effect between time and the sociodemographic variables of gender, age, seniority in the organisation and seniority in the job role on the dimensions of motivation. This finding suggests that, regardless of these demographic or professional characteristics, the impact of the pandemic on the different dimensions of motivation did not vary significantly for these groups. This implies that the changes observed in the various forms of motivation were, in a way, universal among employees, regardless of these variables.

However, a significant interaction effect was identified between time and level of education, more specifically in identified regulation, a form of autonomous motivation where individuals internalise the value of the activities they perform. This interaction revealed that the increase in identified regulation from Time 1 to Time 2 was significant only for employees without higher education. For employees with higher education, there was no change in identified regulation over time.

According to the JD-R model and SDT, identified regulation is a reflection of the degree to which individuals

internalise the value of their work, recognising it as consistent with their own goals and values (Deci & Ryan, 2000). One explanation for the increase in identified regulation among employees without higher education may be related to the way these employees perceive work resources and the demands associated with the pandemic. Workers without higher education may have experienced changes in the work environment that provided them with more opportunities to enrich their sense of usefulness at work, seeing these changes as an opportunity to internalise the value of their tasks and align them with their personal goals.

COR argues that, in times of crisis, individuals tend to value and protect their resources. For workers without higher education, the pandemic context may have offered an opportunity to conserve their internal resources (for example, a sense of purpose at work), which may explain the increase in regulation identified. On the other hand, employees with higher education, who often have more tangible resources (such as qualifications and technical knowledge), may not have felt the same need to adjust or internalise new forms of value in their work activities. They already had a relatively stable intrinsic or identified motivation before the pandemic, which justifies the lack of significant change over time.

The absence of significant interactions with variables such as age, gender, seniority in the job and in the organisation can be seen in the light of a general adaptation to the changes brought about by the pandemic. According to the JD-R, if adequate work resources, such as organisational support or teleworking flexibility, are provided consistently to different groups, it is possible that these resources will help to balance the increased demands caused by the crisis, thus preventing significant differences between groups. In terms of SDT, this lack of interaction suggests that, regardless of age or gender, the basic psychological needs of autonomy, competence and relatedness were met in a similar way among all employees, which would have prevented major variations in the forms of motivation observed.

Theoretical implications

The results of this study reinforce the assumptions of SDT, which suggests that autonomous motivation—made up of intrinsic motivation and identified regulation—depends on the fulfilment of the psychological needs for autonomy, competence and relatedness (Deci & Ryan, 2000). The finding that the pandemic context favoured an increase in autonomous motivation among workers, especially those with less education, confirms the crucial role that work resources play in fostering this form of motivation (Gagné & Deci, 2005).

This finding suggests that the work environment created during the pandemic may have facilitated meeting these

needs, with greater autonomy in tasks due to teleworking and a greater focus on organisational well-being. This evidence adds to the literature on SDT by highlighting that, in times of crisis, organising resources and structures that support these basic needs has an even stronger impact on autonomous motivation. This also confirms Fernet et al.'s (2012) idea that labour resources that enable these needs to be met contribute directly to healthier and more sustained motivation over time.

This study also contributes to the literature by expanding the JD-R model to the context of crises, such as the COVID-19 pandemic. Traditionally, the JD-R model suggests that workers' motivation depends on the balance between resources and demands at work (Bakker & Demerouti, 2017). The results suggest that the increase in work resources during the pandemic, such as greater flexibility and autonomy, was crucial to compensate for the increased demands, such as stress and uncertainty.

The absence of significant variations in variables such as gender, age or seniority at work suggests that the positive impact of labour resources cuts across different demographic groups. However, the increase in autonomous motivation among workers without higher education, in contrast to workers with higher qualifications, emphasises the importance of considering how different groups value and use the resources on offer (Bakker et al., 2023a, 2023b). The finding that lower-skilled workers had a significant gain in identified regulation also reinforces the idea that work resources are particularly valuable to those who, in normal contexts, may have less access to them, as suggested by Fernet et al. (2012).

Hobfoll's COR (1989) postulates that individuals try to preserve, protect and accumulate resources, especially in times of crisis. The results of this study, which show that workers were able to avoid an increase in amotivation, can be explained by COR, since employees, by preserving their resources—such as job security or financial stability—were able to remain motivated, even in adverse circumstances. This study contributes to the COR literature by demonstrating that, in times of crisis, people use available resources strategically to avoid burnout and maintain their motivation. The fact that amotivation did not increase despite the demands of the pandemic suggests that workers were able to preserve their resources, such as the perceived value of their work and organisational support, maintaining their motivation even in the face of great uncertainty. This finding underlines the need for organisations to focus on protecting workers' resources, especially during crises, in order to avoid a deterioration in motivation and performance.

An innovative contribution of this study is the finding that the level of education moderated the effect of the pandemic on identified regulation. Employees without higher

education showed a significant increase in identified regulation over time, which indicates that they internalised the value of their tasks more during the pandemic, while employees with higher education maintained stable levels.

This result contributes to the literature by suggesting that different demographic groups may react differently to contextual and organisational changes. For lower-skilled workers, the opportunity to reorganise their work during the pandemic may have been perceived as a way to revalue their roles and gain greater meaning in their daily activities, as proposed by Gagné and Deci (2005). This result also suggests that organisational interventions should be adapted to different groups, recognising that opportunities for internalising organisational values can vary significantly according to the socio-demographic profile of workers.

Practical implications

The results of this study suggest that organisations should prioritise the provision of work resources that respond to employees' psychological needs. SDT emphasises the importance of providing conditions that foster autonomy, competence and relationships (Deci & Ryan, 2000), aspects that have been proven effective in increasing autonomous motivation during the pandemic. Practices such as teleworking, flexible working hours and autonomy in decision-making have given employees greater control over their work, increasing their intrinsic motivation and sense of usefulness at work.

Fernet et al. (2012) reinforce that resources that meet psychological needs contribute to employee engagement, as they facilitate the internalisation of organisational values and reduce the risk of emotional exhaustion. This study, by demonstrating that employees without higher education experienced a significant increase in identified regulation, suggests that organisations should focus on providing specially adapted resources for employees with lower levels of education. These employees can particularly benefit from interventions that promote autonomy and the development of their skills, helping them to see more value in their work and identify with organisational goals.

The fact that the study identified that the level of education moderated the impact of the pandemic on motivation suggests that organisations should adopt differentiated management practices according to the profile of their employees. While workers without higher education saw an increase in autonomous motivation, employees with higher education showed no significant changes. This indicates that work resources can be interpreted and utilised differently depending on the background of the employees.

The practical implications of this finding are clear: organisations must adapt their human resource development

strategies to different groups. For example, for workers with a lower level of education, creating opportunities for skills development and continuous feedback can help increase identified regulation, promoting a greater sense of purpose and alignment with the organisation's objectives. Gagné and Deci (2005) stress the importance of organisations offering support that allows for the internalisation of work values, something that can be especially relevant for employees in more operational positions.

According to the JD-R model, organisations should focus on ensuring a balance between the demands of the job and the resources made available (Bakker & Demerouti, 2017). During the pandemic, many organisations introduced new demands (such as the need to adapt quickly to teleworking or the increased emotional workload). However, when these new challenges were offset by resources such as greater flexibility, autonomy or psychological support, the negative effects were mitigated and, in some cases, transformed into gains in motivation.

Organisations should therefore invest in programmes that increase work resources, such as social support, positive feedback and autonomy in carrying out tasks, while monitoring and adjusting the demands associated with job roles. The study shows that the introduction of resources was a crucial factor in employees maintaining high levels of autonomous motivation, even in the face of greater demands. This means that in times of crisis, the organisation's ability to adjust the balance between demands and resources becomes vital to maintaining employee motivation and well-being.

The results of this study, which show that there was no significant increase in amotivation among employees during the pandemic, suggest that organisations should focus on protecting and enhancing the resources that employees consider most valuable. According to the COR (Hobfoll, 1989), employees seek to protect their resources—such as job security, organisational support or recognition—in order to avoid amotivation and attrition. During the pandemic, employees have maintained stable levels of motivation, which suggests that organisations have, in many cases, managed to maintain the resources necessary for employees to feel motivated and engaged at work.

Organisations should therefore ensure that, in times of crisis, key resources (such as emotional support, job security and clear communication) are widely available and reinforced. The implementation of continuous support policies, such as psychological counselling, support in adapting to teleworking and financial security, has helped to preserve employees' motivation, preventing a deterioration in their performance.

The pandemic has demonstrated the importance of organisations quickly adapting their practices to meet the

emerging needs of employees. This study reveals that employees have benefited from resources that have met their needs during the crisis, such as autonomy and flexibility at work. As well as ensuring continuity of work, these changes created an environment that encouraged autonomous motivation and allowed employees to internalise the values of their jobs, which is essential for their well-being.

Organisations must therefore continue to invest in flexible practices and adapt to contextual changes, especially in times of uncertainty. The use of personalised strategies for each group, aligned with the JD-R model, can ensure that organisational interventions respond effectively to demands and provide adequate resources to maintain employee commitment and motivation.

Limitations and future research

This study makes several important contributions to understanding employee motivation in crisis contexts, but it also has some limitations that should be considered when interpreting the results. A significant limitation of this study lies in the size and composition of the sample. Although the sample included a variety of employees, representativeness may be limited, especially in terms of different professional sectors. Most of the participants may have come from specific work areas, which limits the generalisability of the results to other industries or organisational contexts with distinct work structures and resources. As Bakker and Demerouti (2017) point out, the impact of resources and work demands can vary substantially between professional contexts. Therefore, the results observed here may not apply equally to all sectors, requiring caution when extrapolating the data.

This study is two-wave in nature, which means that the data was collected at a specific point in time and does not allow for a longitudinal analysis of the effects of the pandemic on different forms of motivation over time. Two-wave studies can capture momentary or temporary variations in employee perceptions and motivations, but cannot identify deeper or lasting changes. Hobfoll (1989) suggests that the loss or gain of resources can occur gradually, and the COR could be better explored with a longitudinal study measuring the long-term effects of the pandemic. For future research, it would be advisable to conduct longitudinal studies that allow us to observe the evolution of motivation dimensions over longer periods.

The study relied heavily on self-report questionnaires, which can introduce response bias. Employees may have answered the questions in a socially desirable way, or based on how they thought they should feel, rather than reflecting their actual perceptions. Self-determination theory (Deci & Ryan, 2000) emphasises the importance of genuine

motivation, and self-report instruments may not always accurately capture individuals' real motivation. Future studies could benefit from more diverse methodologies, such as qualitative interviews or the use of behavioural data, to complement self-report questionnaires and reduce the risk of bias.

Although the study provided valuable insights into the impact of the pandemic on employee motivation, the pandemic context represents an extraordinary and unprecedented situation. The results observed may be influenced by the uniqueness of this crisis and may not be repeated in other contexts of crisis or adversity. The COVID-19 crisis has brought drastic social and professional changes that may have conditioned employees' behaviours and perceptions in ways that would not be replicated in other scenarios. Thus, there is a limitation in terms of context, and the results should be interpreted with caution if applied to situations other than global crises.

Based on the limitations identified, this study opens up several opportunities for future research, which could deepen the understanding of employee motivation in crisis contexts and in different work environments. One of the most relevant suggestions for future studies is to carry out longitudinal studies that follow employees over time to assess how motivation and perceptions of resources and demands evolve after prolonged periods of crisis. Such studies would allow for a more detailed analysis of the lasting effects of the pandemic on employees' motivation and mental health, as well as the impact of organisational strategies to manage crises in a sustained manner (Bakker & Demerouti, 2017). These studies would also help to understand whether the changes observed in identified regulation or autonomous motivation are maintained in the long term, or whether they are temporary phenomena.

Future studies could also broaden the range of organisational contexts and include more diverse professional sectors, such as industries that have been more directly affected by the pandemic, like the health sector and the retail industry. Research that includes workers in different organisational settings could identify variations in the effects of work demands and resources on different types of work, enriching the literature on the JD-R model (Bakker & Demerouti, 2017; Demerouti & Bakker, 2023). In addition, including employees with different hierarchical levels within the organisation can provide a more detailed perspective on how work resources influence different groups of employees.

To reduce reliance on self-report questionnaires, future studies could adopt a multi-method approach, combining quantitative and qualitative techniques. For example, the inclusion of qualitative interviews or focus groups would make it possible to explore employees' experiences in

greater depth and gain a richer understanding of the factors that influence their motivation and well-being. In addition, the collection of behavioural data, such as performance records or supervisor evaluations, could complement questionnaires, offering a more objective view of employee motivation and performance.

Future studies should also explore the impact of other crisis contexts—such as economic crises, natural disasters or internal organisational changes (restructuring, mergers)—on employee motivation. Research into the impact of COVID-19 provides an important basis, but there is potential to expand this research to other types of crisis that may bring different challenges. Conservation of Resources Theory (COR), for example, can be applied to these different scenarios, as employees may react differently depending on the type of resources at risk and the recovery strategies available (Hobfoll, 1989).

Finally, future research could explore the impact of specific organisational interventions on increasing employee motivation, such as skills development programmes or strategies focused on increasing employees' emotional resilience. Assessing the effectiveness of such interventions in increasing autonomous motivation and decreasing burnout or amotivation would be an important step towards translating theoretical findings into concrete organisational practices (Fernet et al., 2012). These interventions could be especially useful for workers with lower levels of resources, such as those without higher education, who, as the study showed, particularly benefit from resources that promote identified regulation and a sense of purpose.

Conclusion

This study explored the impact of the pandemic context on the various dimensions of employee motivation, highlighting the importance of work resources for autonomous motivation. The results revealed that the increase in regulation identified was more significant in workers without higher education, indicating that they benefited more from the conditions provided during the pandemic, such as greater autonomy and control over their tasks. Deci and Ryan's SDT (2000) argues that when autonomy, competence and relationship needs are met, autonomous motivation increases, which was confirmed by the results. On the other hand, the absence of a significant increase in amotivation can be explained by Hobfoll's COR (1989), which suggests that during crises, workers seek to protect their personal and professional resources. This study also reinforces the importance of adapting organisational interventions to the socio-demographic profile of employees, highlighting the need for personalised strategies that promote an effective balance

between work demands and resources, as postulated by the JD-R model (Bakker & Demerouti, 2017). Thus, resource management continues to be a determining factor for employee motivation and well-being in times of adversity.

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Data availability The data that support the findings of this study are available from the corresponding author upon request.

Declarations

Ethics approval On July 12, 2018, the Research Ethics and Deontology Committee of the Faculty of Psychology and Educational Sciences of the University of Coimbra confirmed that this study meets national and international guidelines for research on humans.

Conflict of interest The authors contributed equally and significantly to the study, and there is no conflict of interest.

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