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RESEARCH ARTICLE

Decent Work dimensions as a demand and/or a resource: Association with workers' health indicators

[version 1; peer review: 1 not approved]

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Abstract

Background

Decent Work (DW), a key component of the United Nations 2030 Agenda for Sustainable Development, encompasses seven dimensions reflecting people's work aspirations. Based on the Job Demands and Resources (JD-R) theory, this study starts from a framework in which these dimensions can function as resources and demands. This study aims to explore the relationship between health outcomes (physical pain, anxiety, depression, and exhaustion) and Decent Work Demands and Resources (DWDaR) profiles.

Methods

The study employs a cross-sectional quantitative design with data from Spain (n=1313) and Portugal (n=494). Data was gathered using socio-demographic surveys, self-reported health indicators, and the Decent Work Demands and Resources Questionnaire (DWDaRQ).

Results

Four DWDaR profiles were identified through TwoStep cluster analysis: Demanding, Rich, Poor, and Resourceful DW. "Adequate working time and workload" emerged as the most prevalent demand, while "Fundamental principles and values at work" was the most

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prevalent resource. ANOVA and chi-square tests revealed that Demanding and Rich profiles were linked to higher levels of negative health outcomes, whereas Resourceful and Poor profiles were linked to lower levels. Demanding and Poor profiles were more prevalent in the Portuguese sample, while the Rich and Resourceful profiles held more individuals with higher education.

Conclusions

This study is significant as it extends the JD-R theory to the DW field and addresses literature gaps by adopting a person-centered approach. It offers practical implications for organizations, policymakers, and future research, highlighting the importance of balancing job demands and resources to promote employee health and well-being.

Keywords
Decent Work, Job demands and resources, Physical Pain, Anxiety, Depression.

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Introduction

The contemporary labor landscape, shaped by globalization and economic transformations, has increased digitalization, workload, and flexibilization of labor relations, pushing workers to show a high performance even in precarious conditions, leading to detrimental effects on worker's health[1–3]. This trend has resulted in precarious employment, increased job insecurity, financial stress, and irregular working hours, contributing to a range of physical and mental health issues such as back pain, neck pain, migraines, anxiety, depression, and burnout[4] that were exacerbated in the post-COVID-19 pandemic context with remote working[5].

Workers in precarious employment situations often lack access to benefits and face intensified work demands, exacerbating their health concerns. According to the European Agency for Safety and Health at Work[6], in 2007, 14.6% of employed individuals in Europe reported a work-related health issue; this figure decreased to 8.8% in 2013, then slightly increased to 10.3% in 2020 during the pandemic. Addressing these challenges requires comprehensive efforts from policymakers, employers, and healthcare providers to ensure stable employment opportunities, adequate benefits, and supportive work environments that prioritize workers' well-being[4,7].

The concept of Decent Work (DW) has emerged as a pivotal framework for assessing the quality of employment and its broader implications on individual well-being[3]. Even though the origins of the International Labour Organization (ILO) dates to the Treaty of Versailles. Somavia, one of the ILO's Director General, defined DW as the sum of people's "aspirations for opportunity and income; rights, voice and recognition; family stability and personal development; and fairness and gender equality"[8,9]. Subsequently, DW was integrated into the 8th Sustainable Development Goal of the United Nations 2030 Agenda[10], capturing a comprehensive framework defined by the ILO.

Diverse perspectives of DW have emerged from economics, public policy, sociology, governments, and private sector approaches, being relevant to consider also subjective aspects related to mental and physical health and the meaning of work for each worker[11,12].

In the Work, Organizational and Personnel Psychology (WOPP) field, DW can be defined by its seven dimensions: (1) Fundamental principles and values at work, (2) Adequate working time and workload, (3) Fulfilling and productive work, (4) Meaningful remuneration for the exercise of citizenship, (5) Social protection, (6) Opportunities, and (7) Health and safety[11].

Based on the job demands–resources (JD-R) theory[13], this study contributes to a new framework in which these seven dimensions can be seen either as resources – if the specific dimension reaches a good level of accomplishment, or triggers new skills development – or demands – if there is required effort to cope with a deficit in the accomplishment of that dimension, or if there is required effort to deal with a high level of the dimension[14].

The JD-R theory explains how job demands and resources impact job performance through employee well-being. Job demands refer to aspects of the job that require sustained effort and are associated with physiological or psychological costs. In contrast, job resources have motivating potential, help achieve work goals, regulate the impact of job demands, and stimulate learning and personal growth[13].

Some demands can stimulate the creation of new resources, while certain resources require the investment of cognitive and emotional energy to be used[14]. The Decent Work dimensions can function as both resources and demands. When highly accomplished they contribute to the well-being and performance, and when there is a deficit they can contribute to worker's resource development. Likewise, DW dimensions can be demands when they require considerable effort to compensate deficits, or when they require a psychological cost to put into practice the resource they are[14]. Therefore, instead of categorizing each decent work dimension solely as a demand or a resource, it is essential to evaluate them on both dimensions, measuring the extent to which they act as a resource and a demand.

Graça *et al.* (2021)[15] stated that the research from a WOPP viewpoint on Decent Work was needed, because it can provide valuable insights for both employees and organizations practices. Thus, the present study serves a psychological approach providing a person-centered perspective using the cluster analysis method, which is highly applied to determine profiles under the JD-R theory and the DW field research[15–17].

In the JD-R theory field, some gaps were pointed out by Bakker *et al.* (2023)[13] in a review of the theory new constructs and misunderstandings, they state that "considerably more work is needed to increase our knowledge of organizational life and to expand JD-R theory"[13, p. 45]. Further on, they suggest that future research should approach other domains of work (job and organizational) and nonwork (family and personal) to test the effect of demands and resources on employees' well-being across different domains of life. Thus, the concept of DW and its dimensions encompassing many spheres of the employee's life and workplace (for example, health and safety, work-life-flow and growth opportunities) would be a good construct to meet this gap.

This research justifies the imperative to address these gaps and provide a holistic understanding of the relationships between Decent Work dimensions, demands, resources, and workers' health indicators. As the labor market continually transforms and the importance of employee well-being gains prominence[6,7], there is a need to further increase research and clarify the complexities of these interactions.

This research enriches academic discourse and provides practical insights for policymakers, organizations, and health practitioners. It explores the impact of the seven dimensions of Decent Work, viewed both as demands and resources, on the self-reported health indicators of Portuguese and Spanish workers, including physical pain, anxiety, depression, and work-related

exhaustion. It holds particular importance as it contributes to converge the Decent Work framework and JD-R theory, expanding both. Additionally, this research advances the field of employee health by providing empirical evidence on how Decent Work dimensions impact worker well-being.

Literature review

Decent work

The definition of DW can be analyzed at three levels. The macro level emphasizes objective economic indicators, such as unemployment rates and wages, overlooking the subjective perceptions of working conditions. The organizational level encompasses what the organization can do to offer employment that complies with DW standards. Meanwhile, the micro level highlights the workers' perception, considering the meaning and value of work, challenges, and opportunities, considering the entire professional context of the worker[11,18].

The DW concept is frequently viewed as a multidimensional construct comprising various components[19–22]. The ILO (2013)[23] initially established the four fundamental pillars of the ILO's Decent Work Agenda: the promotion of employment and enterprises, the guarantee of labor rights, the extension of social protection, and the promotion of social dialogue. These pillars are considered the baseline to other models because they ensure DW and dignified lifestyles, stressing fair working conditions and labor rights for all individuals[24].

The ILO identified 11 components under the Decent Work Agenda[23], reflecting its core values: freedom, equality, security, and human dignity. Each component, equipped with specific indicators, covers a unique facet of Decent Work: (1) Employment opportunities; (2) Adequate earnings and productive work; (3) Decent Work time; (4) Combining work, family and personal life; (5) Work that should be abolished; (6) Stability and security of work; (7) Equal opportunity and treatment in employment; (8) Safe work environment; (9) Social security; (10) Social dialogue, worker's and employer's representation; (11) Economy and social context for Decent Work. Collectively, these elements aim to improve global labor standards and conditions[23].

Decent work dimensions and job demands and resources theory. With the aim of developing a perspective that addresses Decent Work (DW) from Work, Organizational and Personnel Psychology approach, Ferraro *et al.* (2018)[22] conducted research to develop and validate the Decent Work Questionnaire (DWQ), based on the 11 substantive elements, and covering all the spectrum of the ILO`s definition of DW. Through exploratory and confirmatory factor analyses, the authors identified seven dimensions.

The first dimension, "fundamental principles and values at work," evaluates workplace alignment with values such as justice, dignity, participation, freedom of expression, non-discrimination, and trust[11,24]. When achieved, it acts as a resource but may require time and energy—such as participating in decision-making. A deficit represents a demand, though it can also challenge the worker to develop coping skills[14].

The second dimension, "adequate working time and workload," addresses work hours, work-life balance, and effort[24]. High achievement functions as a resource, while low achievement is a demand. The concept of Work-Life-Flow reframes this dimension through JD-R theory, integrating demands and resources. Flexible work arrangements (e.g., telecommuting or hybrid work) can introduce additional demands affecting well-being, yet may also serve as resources. Fulfillment from work may persist even with deficits in this area[1,25].

The "fulfilling and productive work" dimension relates to innovation and intrinsic motivation[11]. High levels represent strong resources for well-being and performance but also entail psychological costs. Conversely, low levels may reduce investment and satisfaction[13].

"Meaningful remuneration for the exercise of citizenship" involves earnings and their perceived fairness to support autonomy in society[22,24]. Fair compensation is a key resource, ensuring financial stability and goal pursuit. In contrast, inadequate pay becomes a demand, contributing to stress, dissatisfaction, and lower engagement[14].

"Social protection" concerns worker and family welfare, including medical leave, unemployment, and retirement[24]. Limited protection heightens insecurity and demands, while strong systems serve as resources, offering stability and support[11].

The "opportunities" dimension relates to career and personal development[11]. These opportunities are key resources, enhancing employability and fulfillment, yet require effort to seize. Constant pressure to pursue them may lead to stress and overload[14].

Lastly, "health and safety" refers to physical well-being and workplace comfort[22,24]. A safe, comfortable environment is a valuable resource for focus and well-being, while its absence represents a significant demand[14].

In general, the perception of job demands not always being inherently negative challenges the misconception that demands are the antithesis of resources. Scholars occasionally struggle to differentiate between job demands and resources, yet it is crucial to recognize that the absence of a demand does not inherently enhance motivation[13,26]. Similarly, the absence of a resource does not necessarily intensify work demands but rather impedes voluntary goal-directed actions.

It is worth noting that both demands and resources can correlate with both positive and negative consequences. The essence of the Job Demands-Resources (JD-R) theory lies in its delineation of two distinct processes: a health impairment process and a motivational process[13].

The health impairment process implies that high work demands elevate the likelihood of burnout and results in adverse effects, such as health issues or intentions to leave, while in the motivational process, work resources serve an inspirational function, promote job enthusiasm, and encourage beneficial organizational

results, like productivity or commitment to the organization[13,27]. Therefore, the essence of job demands lies in their inherent energy expenditure, necessitating attention and effort. Conversely, job resources inherently spark motivation, serving as catalysts for engagement[26].

The joint effect of job resources on the job demands is also studied. The buffer hypothesis shows how job resources can weaken the negative impact of job demands on the worker's health and well-being, whereas the boosting hypothesis affirms that challenging job demands can enhance the positive influence of job resources on work engagement[28–30]. The joint effect of demands and resources was studied by Bakker *et al.* (2023)[13], Fortes and Matens (2022)[31], Hu *et al.* (2011)[32], Lee *et al.* (2017)[33], among others, proving the abundant evidence corroborating its primary assertions.

The integration of this theory applied to Decent Work and considering the possibility of the perception of each DW dimension being a demand and/or a resource is an innovation. This novel perspective of concurrently considering demands and resources remains relatively new within research frameworks[14].

Work and health

According to the World Health Organization[34], work and health are intimately interconnected. Individuals experiencing poor health are more prone to unemployment or underemployment due to their diminished capacity to work. Moreover, when they are employed, poor health hampers their productivity. A vicious cycle increases the likelihood of job loss, sick leave, or early retirement[34,35]. This negative impact of precarious work on individuals is directly related to adverse outcomes, such as challenges in mental health, work-related risk behaviors and attitudes, and the capacity to plan the future[34,35].

Work conditions and employment relations appear to be a key to addressing health inequities[36]. To reduce such inequities, advocating for safe, health-conscious, and stable employment opportunities across all sectors is necessary. Decent Work appears to be a fundamental concept for employees' health and well-being[34,37].

The 2030 Agenda for Sustainable Development[10] includes "Good Health and Well-being" as the third Sustainable Development Goal (SDG) and, as mentioned before, "Decent Work and economic growth" included in the eighth SDG. The main objective of the third SDG is to "ensure healthy lives and promote well-being for all at all ages"[10].

Moreover, other key measures attached to the third SDG are directly aligned with the eighth SDG and vice versa. Countries in the WHO European Region have pledged to uphold the 2030 Agenda and have devised a plan for its execution. This roadmap suggests methods for nations to tackle health issues and their root causes and invest in health through policies grounded in evidence across various sectors. Therefore, it is seen that to achieve Decent Work, an emphasis in health benefits within the objectives is crucial[34,38].

Many studies have explored the intersections between health and DW components. Duffy *et al.* (2021)[39], Sönmez *et al.* (2022)[40] and Duffy *et al.* (2019)[4], studied the links between DW and mental and physical health from a Psychology of Working Theory (PWT) approach, supporting the idea that DW predicted directly and indirectly the health outcomes, showing the importance of securing DW. Besides that, Leitjen *et al.* (2015)[41], even though not directly, explored components of DW such as physical load, higher psychological job demands, and lower autonomy and discovered that the promotion of better work conditions favored the individuals' mental and physical health.

Physical pain. Workplace settings and demands have been demonstrated to correlate with prevalent physical health issues among workers, encompassing musculoskeletal discomfort, headache, fatigue, cardiovascular problems, low back pain, neck–shoulder pain, and insomnia[39,42,43]. Establishing and maintaining a workspace that prioritizes employee well-being fosters a conducive atmosphere for productive labor and serves as a measure against the onset of work-related physical pain[42].

Duffy *et al.* (2019)[4] and Duffy *et al.* (2021)[39] studied the relationship between decent work and physical health issues. These studies demonstrate that DW directly and indirectly via workplace fatigue, need satisfaction at work, and survival need fulfillment predicted overall physical health, health symptoms, and health behaviors. In conclusion, the studies suggest that promoting DW may secure physical health by meeting basic survival needs and having less workplace fatigue[4,39].

Anxiety and depression. There is a consensus in the literature that aspects such as job insecurity, workplace support, autonomy, psychological job demands, and unstable work hours correlate with mental health factors, including well-being, life satisfaction, and stress[4]. The two most common mental disorders related to work leaves in the United States are anxiety and depression, and those disorders can serve as risk factors for physical conditions and outcomes of injuries and work leaves[44].

Other issues related to mental disorders in the workplace are insecurity and precariousness which are associated with depression and anxiety[45]. Some other issues that workers must deal with are emotional demands, the threat of replacement human activities by machines, workplace bullying, isolation, and blurred boundaries between work and private life from remote working. All these issues could potentially have significant adverse consequences, given the percentage of workers experiencing symptoms of anxiety and depression related to work[44,45].

Exhaustion at work. Emotional exhaustion is when individuals experience a sense of emotional overwhelm and depletion, as an exhaustion of their emotional resources[46]. This state of emotional depletion can impede one's ability to effectively manage daily responsibilities and can exert a substantial influence on both personal and professional spheres, leading to and being the core symptom of Burnout. Because of that, it has become an occupational health issue that needs attention, and studying factors related to exhaustion at work is needed[46–48].

In the JD-R theory, exhaustion is viewed as a consequence of high exposure to specific job demands, such as intense physical, affective, and cognitive strain[27]. The presence of work-related stressors and the absence of resources in the workplace can lead to exhaustion at work[46]. Thus, this issue represents a dysfunctionality for the individual's well-being and the organization. Exhausted employees will perform at lower levels of commitment and potentially increase their turnover intentions[47].

The association between these health indicators and labor conditions underscores the importance of viewing work as a determinant of health. Building on this perspective, the frameworks of Decent Work and the Job Demands-Resources (JD-R) theory offer complementary approaches to understanding how different aspects of the work context may contribute to these outcomes. While Decent Work highlights structural and psychological dimensions essential to dignified and sustainable employment, the JD-R theory provides a dynamic model for interpreting how these dimensions might operate as either demands or resources. By integrating these frameworks, this study proposes a theoretical foundation for exploring how the quality of work may relate to workers' health, offering a person-centered approach that remains sensitive to both individual perceptions and broader labor conditions.

Method

Participants

The sample was selected by convenience gathering the participance of 2308 individuals from Portugal and Spain that were involved in labor activities at the moment of data collection, from which were excluded the cases of participants who had not responded at least 80% of the questionnaire. Therefore, the final sample was made up of 1807 participants from Portugal (n= 494) and Spain (n= 1313). Table 1 presents the socio-demographic profile of the sample.

The participants were mainly female in both countries, with ages concentrated between 18 and 49 years. The number of dependent children had means around 1 in Spain (M=0.84) and Portugal (M=1.16) and the majority did not consider themselves informal carers. Regarding education, most of the individuals had a secondary, technical, or bachelor's level, but with the difference that in Spain 24.3% had Trade/technical/vocational training against only 7.5% in Portugal.

In terms of the professional characterization, the workers mainly were employed full-time currently, but with a considerable frequency of part-times in Spain (21.6%). The sectors of activities that were more prevalent were professional services (journalists, lawyers, designers, etc.), education and health. Other sectors that were notably mentioned were administration, commerce and sales, hotel industry, construction, and transport. Moreover, the participants worked mainly from the office (44.2% in Spain and 66.2% in Portugal) or in a hybrid - home and office configuration (18.1% in Spain and 19.0% in Portugal).

Table 1. Socio-demographic characterization of the Spanish and Portuguese samples (N =1807).

Variables	Spain (*n* = 1313)		Portugal (*n* = 494)	
	n	%	n	%
Gender				
Male	439	33.4	158	32.0
Female	714	54.4	270	54.7
Non-binary/Third gender	71	5.4	33	6.7
Prefer not to say	89	6.8	33	6.7
Age				
18 – 24 years	446	34.0	77	15.6
25 – 34 years	261	19.9	129	26.1
35 – 49 years	273	20.8	180	36.4
50 – 65 years	332	25.3	105	21.3
> 65 years	1	0.1	3	0.6
Education				
Primary school	37	2.8	13	2.6
Secondary school	148	11.3	159	32.2
Trade/technical/vocational training	319	24.3	37	7.5
Bachelor's degree	557	42.4	176	35.6
Master's degree	186	14.2	83	16.8
Doctorate degree	16	1.2	7	1.4
Other	50	3.8	19	3.8

Instruments

This research was developed as part of a larger project and the results of the present work were taken from 3 questionnaires from the self-report survey that were administrated in Portuguese and Spanish. The questionnaires were the socio-demographic questionnaire (age, gender, number of dependents, number of people in the household, education level, job, country of work, sector of activity, position and remote work), Decent Work Demands and Resources Questionnaire (DWDaRQ) and the self-reported health questionnaire.

Decent work demands and resources questionnaire. This questionnaire was based on the seven original DW dimensions[22]. Regarding each dimension, two items were created. It consists of 14 questions, being the core definition of each dimension presented, followed by the question "to what extent are those aspects overwhelming or stressful for you" for demands and "to

what extent are those aspects helpful and contributive to your well-being" for resources. The answers were given on a 5-level Likert scale, going from "not at all" to "very much". The instrument was developed under the aforementioned project on Work-Life-Flow, and its preliminary results were published by Czakert *et al.* (2024)[25].

The results of Cronbach's Alpha scores, used to assess internal consistency for the "Demands" and "Resources" dimensions of the DWDaRQ were satisfactory for both countries. Scores in Spain indicate good reliability for "Demands": 0.82, but slightly lower for "Resources": 0.69, while Portugal exhibits similar reliability for "Resources" (0.81) and "Demands" (0.80).

Health outcomes: physical pain, anxiety, depression, and exhaustion. The self-reported outcomes were measured by a questionnaire that asked to "please indicate the frequency you have felt this way over the last month" followed by options described below. The answers were given in a 7-level Likert scale, going from "never" to "almost always".

The physical pain variable included "back pain, neck pain, headaches, etc." and it was assessed by one question in the beforementioned questionnaire. The following questions, regarding anxiety, depression, and exhaustion, were built based on the results from the model proposed by Daniels (2000)[49] in which the items represented the five aspects of affective well-being. The anxiety variable included the questions regarding "anxious" and "at ease", though the item "at ease" was inverted to correspond to the right direction of the construct. The depression variable reunited the items "depressed" and "happy", which was also inverted. Finally, the exhaustion at work dimension included the items "exhausted" and "active" inverted.

Cronbach's Alpha analysis indicated that the scale, including the aforementioned items, received a coefficient of 0.80 from Spain and 0.83 from Portugal, indicating good internal consistency.

Procedure

The data was gathered by undergraduate students enrolled in an advanced psychology course as part of their research methods curriculum, designed to familiarize them with ethical and technical protocols for administering scales. Each student obtained between 5 and 10 completed questionnaires from their personal network of acquaintances. This limited number of participants per student aimed to enhance data quality, as students could recruit individuals from their personal connections who were willing to participate. Every participant provided informed consent, and each student compiled a report for every participant, detailing the questionnaire application context, the nature of the student-participant relationship, and any queries or concerns raised by the participant along with the student's responses. Each student signed a declaration of responsibility affirming the accuracy of the collected data.

This research was approved under the Bioethics Commission and the Ethics and Research Deontology Committee of the universities participating in the research. It was made complying with the European Union legislation on ethics, anonymity/privacy, and security in Social Science and Humanities, and with the European Code of Conduct for Research Integrity (European Federation of Academies of Sciences and Humanities), as well as comprised the European ethical and Privacy Principles.

Data analysis

The study is a cross-sectional quantitative design with an exploratory objective. All the analyses were performed using the statistical programs SPSS and RStudio. Descriptive statistics were assessed through frequencies, mean and standard deviation.

A TwoStep cluster analysis method, a scalable cluster analysis algorithm, was employed, distance measure was computed using the Log-Likelihood distance metric, and Schwarz's Bayesian Criterion was applied for cluster classification[50]. It was used to determine the optimal number of clusters from each dimension of DWDaRQ (demands and resources). The clusters formed were combined into Decent Work demands and resources (DWDaR) profiles.

Analysis of variance (ANOVA) and chi-square were used to determine differences between the groups of each DW profile. The posthoc analysis used were the Bonferroni, Pairwise and Games-Howell methods[51]. Internal consistency was assessed by Cronbach alpha coefficient. A probability of .05 for the Type I error was considered for all the inferential statistics. Missing values were identified in the sample, due to the nature of the survey and the number of participants. All missing values were deleted from each analysis.

Results

Cluster analysis and decent work profiles

The items of the DWDaRQ were divided into its two dimensions: demands and resources, and the seven items of each dimension were submitted to a two-step cluster analysis (log-likelihood distance measurement, Schwarz Bayesian criterion), that resulted in two clusters for demands (see Table 2), one with low means and one with high means; and two clusters for resources (see Table 3), with low means and high means. All clusters showed fair quality of discrimination.

The results regarding the importance and the mean from each item of each cluster show that in the demands most of the variables have an importance above 0.80 in forming the cluster, except the items 4D and 2D. The items with the highest means in general were the "3D. fulfilling and productive work" and the "2D. adequate working time and workload". On the other hand, the items that showed the lower means were the first and the seventh (fundamental principles and values at work; health and safety).

Overall, in the demands, the difference between the lower and higher means is bigger in comparison with the ones in the resources' clusters, which present higher means in general. However, the second dimension of DW (adequate working time

Table 2. Descriptive Statistics for Cluster analysis for the demands' items of DWDaRQ.

Items	Cluster–High (41.7%)		Cluster–Low (58.3%)	
	Importance	*M*	Importance	*M*
1D. fundamental principles and values at work	1.00	3.15	1.00	1.63
6D. opportunities	0.89	3.32	0.89	2.02
7D. health and safety	0.87	3.16	0.87	1.82
5D. social protection	0.85	3.52	0.85	2.22
3D. fulfilling and productive work	0.84	3.62	0.84	2.36
4D. meaningful remuneration for the exercise of citizenship	0.79	3.47	0.79	2.17
2D. adequate working time and workload	0.57	3.96	0.57	2.94

Table 3. Descriptive Statistics for Cluster analysis for the resources' items of DWDaRQ.

Items	Cluster–High (53.4%)		Cluster–Low(46.6%)	
	Importance	*M*	Importance	*M*
6R. opportunities	1.00	4.12	1.00	2.63
7R. health and safety	0.71	4.39	0.71	3.19
4R. meaningful remuneration for the exercise of citizenship	0.57	4.18	0.57	3.19
5R. social protection	0.52	4.39	0.52	3.40
1R. fundamental principles and values at work	0.43	4.51	0.43	3.61
3R. fulfilling and productive work	0.34	3.85	0.34	3.00
2R. adequate working time and workload	0.18	3.30	0.18	2.65

and workload) has the lowest means, and the first dimension (fundamental principles and values at work) has the highest. The importance of the resources is mostly below 0.60.

Therefore, it is possible to see that DW's first and second dimensions show opposite directions on the means when considering the demands and resources. While individuals seem to have the largest means in the perception of the "adequate working time and workload" as demands, they have the lowest means in its perception as resources.

On the other hand, the "fundamental principles and values at work" has the lowest means in demands and the highest in resources. This tendency could imply that the work-life-flow is more demanding and less resourceful to the participants, and the principles and values at work are more resourceful than demanding for them, but that should be confirmed in further analysis.

After this step, the two clusters from each dimension were combined into four Decent Work Demands and Resources (DWDaR) profiles, that were named based on other profiling works using the JD-R theory[16,17] and adapted to the findings of these research and the DW realm. Thus, the four profiles were classified into: *Demanding Decent Work* (high demands and low resources), *Rich Decent Work* (high demands and high resources), *Poor Decent Work* (low demands and low resources), and *Resourceful Decent Work* (low demands and high resources). Table 4 presents the socio-demographic characteristics regarding the DWDaR profiles.

Thus, it is possible to see that in terms of countries, the Demanding and Poor DW profiles were more prevalent in the Portuguese sample (40.1% and 41.9%) in comparison with the rich and resourceful profiles (15.3% and 19.7%), that had a high presence of Spanish participants (84.7% and 80.3%). Regarding age, the participants in the Rich and Resourceful

Table 4. Socio-demographic characterization of the DWDaR Profiles.

Variables	DWDaR Profiles							
	Demanding (n=304)		Rich (n=255)		Poor (n=344)		Resourceful (n= 487)	
	n	%	n	%	n	%	n	%
Country								
Spain	182	59.9	216	84.7	200	58.1	391	80.3
Portugal	122	40.1	39	15.3	144	41.9	96	19.7
Age								
18 – 24 years	70	23.0	82	32.2	79	23.0	185	38.0
25 – 34 years	53	17.4	57	22.4	73	21.2	108	22.2
35 – 49 years	96	31.6	68	26.7	95	27.6	90	18.5
50 – 65 years	84	27.6	48	18.8	95	27.6	104	21.4
> 65 years	1	.3	0	0.0	2	.6	0	0.0
Education								
Primary school	4	1.3	4	1.6	17	4.9	13	2.7
Secondary school	72	23.7	37	14.5	70	20.3	67	13.8
Trade/technical/ vocational training	71	23.4	41	16.1	65	18.9	96	19.7
Bachelor's degree	98	32.2	124	48.6	128	37.2	223	45.8
Master's degree	46	15.1	41	16.1	40	11.6	64	13.1
Doctorate degree	2	.7	1	.4	4	1.2	10	2.1
Other	11	3.6	7	2.7	20	5.8	14	2.9

profiles were slightly younger (between 18 and 34 years old). Regarding education, in the Rich and Resourceful DW profiles, higher education level was more prevalent (65.1% and 61%) than in the Demanding and Poor (48% and 50%).

ANOVA

Three analyses of variance (ANOVA) were performed to examine whether the DWDaR profiles differ from each other in terms of the psychological health outcomes studied. Thus, the independent variables were the DWDaR profiles, and the dependents were anxiety, depression, and exhaustion at work. The tests were statistically significant (p = .000 < .05) in the three analyses, and the homogeneity criteria was met in two of the variables, "depression" and "exhaustion at work", in which the post-hoc procedure used was the Bonferroni. For the variable anxiety, in which the homogeneity of the variance was violated, the post-hoc used was the Games-Howell, which does not assume equal variances and is also robust against differences in sample size. Table 5 presents the results in terms of means, standard deviation, univariate tests (F) and magnitude of the experimental effect (η_p^2).

In general, the anxiety variable showed the higher means, followed by the exhaustion at work and, finally, the depression. Considering these results, it is possible to see a pattern in the DWDaR profiles when compared to the means of the health outcomes. In all the cases, the Demanding profile presented the highest means of anxiety, depression and exhaustion at work, followed by the means of Rich DW. The third highest means were present in the Poor DW profile, while the Resourceful DW presented the lowest means in this sample. The F-values suggest that the differences between the group means are not due to random chance but reflect actual differences in the population, even though the effect sizes can be considered small to medium.

After the ANOVA results showed good significance, the Bonferroni and Games-Howell post-hoc analyses were applied. The tests showed that the multiple comparisons between the DWDaR profiles reveal significant differences influenced by the levels of demands and resources with some exceptions. There was no significant difference between groups in the comparison between the means of the poor and resourceful

Table 5. Means and standard deviations of Health Outcomes in function of DWDaR profiles: univariate tests (F) and magnitude of the experimental effect (η_p^2).

	DWDaR Profiles									
	Poor		**Demanding**		**Resourceful**		**Rich**			
Health outcomes	***M***	***SD***	***M***	***SD***	***M***	***SD***	***M***	***SD***	***F*(3,1315)**	η_p^2
Anxiety	3.38	1.23	3.99	1.11	3.25	1.16	3.82	1.08	31.11*	.066
Depression	2.85	1.15	3.25	1.18	2.64	1.04	3.11	1.13	20.27*	.044
Exhaustion	3.52	.97	3.85	.99	3.36	.98	3.69	.91	17.12*	.038

*$p < .001$.

profiles and the demanding and rich profiles in all three health outcomes here analyzed. In addition, the comparison between the poor and rich profiles had no significant differences in the means in the "exhaustion at work" variable.

Chi-Square

For the ordinal variable "Physical Pain" the test of independence of Chi-Square[51] was used. The analysis showed a statistically significant association between the DWDaR profiles and the physical pain: $\chi^2(18, N = 1319) = 33.251$, $p = .016$. Table 6 shows the observed and expected frequencies.

Generally, the Poor and the Resourceful DW profiles present higher values observed than the expected in the lowest levels of the physical pain scale and lower values in the highest levels. On the other hand, the Demanding and Rich DW profiles reveal lower values observed than expected in the lowest levels of the scale and higher values than expected in the highest part of the physical pain scale. This tendency shows a similar pattern to what the results in the ANOVA revealed: individuals in the Demanding and Rich DW profiles seem to present a slightly higher prevalence of physical pain than the ones in the Poor and Resourceful DW profiles.

To investigate the data further, a post-hoc pairwise test was performed for multiple comparisons. The values of significance, adjusted by the Bonferroni methods, show that only the Demanding and Resourceful DW profiles presented a significant difference ($p = .003$) between each other. The Poor and Rich profiles presented a similar tendency for physical pain to the other health outcomes, and the differences between the groups were no significant.

Discussion

The results regarding the cluster analysis show a differentiation of a high and low cluster regarding the means of the DW dimensions as demands and resources. In general, the sample presented higher means regarding the resources' items than the demand ones, showing that the individuals considered the current status of DW dimensions contributing more to their wellbeing rather than stressful and an exigence for improvement.

Even though the results showed a higher level of resources, some dimensions still had higher means as demands. The "adequate working time and workload" appeared to be the most demanding and less resourceful DW dimension. According to Berger *et al.* (2023)[1] this is the DW dimension of upmost importance because it relates not only to organizational and performance losses, but most importantly, to serious health and well-being impairment issues. Other than that, a high workload requires employees to invest more time, focus, and energy into their tasks; this energy expenditure leads to a loss of resources, causing consequences in physical and mental health[1].

On the other hand, the dimension "fundamental principles and values at work" was the most resourceful and less demanding dimension of the sample. This DW dimension relates to aspects such as trust and respect at work, human rights, freedom of expression, and non-discrimination[11]. In a work setting, this dimension as a resource can contribute to the construction of psychological safety and general well-being, leading to satisfaction and engagement at work.

Taking into consideration the explanatory nature of this work, the four DWDaR profiles can be characterized. The Demanding DW profile can be defined by individuals who need better work conditions and where attention for improvement is more required. In terms of the JD-R theory, this profile can be associated with the health impairment process[13], in which the high level of demands can elevate the likelihood of adverse effects, such as health issues[13,27]. The ANOVA and chi-square results can support this proposition, taking into consideration that in all the tests, the Demanding DW profile shows the highest levels of physical pain, anxiety, depression, and exhaustion at work.

The Rich DW profile can be characterized by individuals who present high demanding DW and high resourceful DW simultaneously. The JD-R theory call this possibility a buffer and a boosting hypothesis, in which job resources can buffer the negative effects of job demands on health and well-being, while challenging job demands can boost the positive impact of job resources on work engagement[28–30]. The findings in this

Table 6. Observed and expected frequencies of the physical pain in function of the DWDaR Profiles.

	Frequency of physical pain in last month						
DWDaR profiles	**Never (n=84)**	**Almost Never (n=126)**	**Rarely (n=169)**	**Sometimes (n=449)**	**Often (n=256)**	**Very Often (n=197)**	**Almost always (n=126)**
Poor							
Observed	11	17	21	36	26	10	12
Expected	7.9	11.9	16.0	42.4	24.2	18.6	11.9
Demanding							
Observed	17	31	44	108	74	61	51
Expected	23.0	34.6	46.4	123.2	70.2	54.0	34.6
Resourceful							
Observed	35	46	43	154	66	59	18
Expected	25.1	37.7	50.6	134.3	76.6	58.9	37.7
Rich							
Observed	21	32	61	151	90	67	45
Expected	27.9	41.8	56.1	149.0	85.0	65.4	41.8

study regarding the Rich DW profile and the health outcomes can be controversial. The levels of physical pain, anxiety, depression, and exhaustion were lower in this profile in comparison with the Demanding (and low resourceful) one, supporting the hypothesis that the presence of high demands resulted in a buffer effect. On the other hand, the presence of high demands did not seem to boost the effect of high resources, considering that the Rich DW profile was the second highest regarding the health outcomes levels, thus not completely supporting the boosting hypothesis.

The Poor DW profile comprehends the individuals who do not show neither demands nor resources at a high level. Without resources or demands regarding DW, individuals in this profile could experience a disengagement and disinvestment in their jobs, not being satisfied or motivated by the motivational process[27], nor experiencing a high prevalence of stress or other health issues due to the health impairment process[13]. Therefore, these could be some of the reasons for the placement of this profile as the third highest (or second lowest) one in relation to the levels of all the negative health outcomes within this sample.

Finally, the Resourceful DW profile characterizes individuals that perceive DW dimensions as helpful and contributing to their well-being. In this sense, the JD-R theory explains the presence of high resources as a motivational process, in which there is a presence of job enthusiasm, engagement, and the enhancement of organizational outcomes such as productivity and commitment[13,27]. According to Bakker *et al.* (2023)[13], through this process, employees have their basic psychological needs satisfied, which can explain the low levels of the negative health outcomes associated with the Resourceful DW profile.

From these results, the idea that Decent Work as a fundamental concept for the sake of employees' health and well-being[34,37] is supported. Individuals who evaluated DW dimensions to be more resourceful and less demanding in their context showed better levels of physical pain, anxiety, depression, and exhaustion. These results also show the importance of job resources in promoting health and well-being for workers and demonstrate that the presence of high demanding DW can still be harmful even with the presence of DW dimensions as resources.

However, the findings of Czakert *et al.* (2024)[25], a study that used the same database to investigate the interactions between the DW dimensions as demands and resources, and key Work-Life-Flow factors, call attention to the relevance of the demands in the presence of negative health outcomes. It was found that viewing the DW dimensions as demands had a greater impact on individual well-being compared to viewing them as resources. This implies that DW conditions may function more as hygiene factors, used to mitigate and prevent health issues, rather than factors that actively enhance positive health outcomes[25].

Other than that, the socio-demographic characterization of the four DWDaR profiles shows that the demanding and poor profiles are proportionally more prevalent in Portugal than expected in comparison with Spain. According to Ferreira *et al.* (2019)[52], due to the economic crisis of the last decade,

precarious jobs have become more common in Portugal's private and public sectors. The country adopted austerity measures, including public sector wage cuts, deregulation of collective bargaining, and reduced unemployment protection. Consequently, the country was ranked third in Europe for job precariousness[52,53]. These results point to the need to address the demands of workers for DW in Portugal.

Another socio-demographic variable that exhibits a discrepancy between profiles is education. Rich and Resourceful profiles presented a higher prevalence of individuals with bachelor's, master's, or doctorate degrees. According to the OECD (2021)[54], the quality and length of schooling individuals get will directly impact their transition from education to work. In terms of the JD-R theory, Solomon *et al.* (2021)[55] mention that individuals with higher levels of education benefit from high job resources, (such as remuneration, autonomy and job variety) and suffer from high job demands (like workload, pressure and job intensity). This aligns with the present findings, in which not only the presence of high resources but also their combination with high demands was prominent in the higher education level of the sample.

Conclusion

To explore the associations of the Decent Work dimensions perceived as a demand and/or a resource with Portuguese and Spanish workers' self-reported health indicators, this study used a person-centered and exploratory approach to identify health tendencies among Decent Work demands and resources (DWDaR) profiles.

The most remarkable DW dimensions in this sample were the "adequate working time and workload", as a strong demand in terms of means, and the "fundamental principles and values at work", as a strong resource regarding the means. Thus, it is important to see that time and workload are an exigence for these workers that needs to urgently be addressed by organizations and policymakers, considering the harm it presents to workers' health and well-being. The principles and values at work seem to contribute to workers' motivation and well-being, and thus, it should continue to be enhanced by the promotion of trust, respect, human rights, freedom of expression, and non-discrimination, creating a safe and supportive work environment.

Regarding health outcomes, individuals in the Demanding and Rich DW profiles were associated with higher levels of physical pain, anxiety, depression, and exhaustion, pointing to the impact of high demands on workers' health. The present findings support the JD-R theory buffer hypothesis, health impairment, and motivational processes[13,27].

Therefore, this study serves as an important instrument for the understanding of the multidimensional concept of Decent Work in the complex context of demands and resources. It holds a significant relevance since it opens the JD-R theory field for decent working conditions and integrates the concept of DW into the JD-R framework. Finally, it deepens knowledge on DW dimensions for employee health and well-being by addressing literature gaps in this perspective in a WOP psychology and human-centered approach[11,14,56].

It also holds a practical relevance, considering it emphasizes the urgent need for organizations, public government, and research to address workers' demands for DW, considering its impact on health and well-being. The presence of a resourceful DW environment must be fostered, thus mitigating the impact of demands and promoting physical and mental health to workers in Spain and especially in Portugal, where demanding and poor profiles are more prevalent. These implications can also be extended to other countries, especially those currently experiencing economic downturns and internal and external crises, in which workers' health and work conditions can be more affected.

Limitations

This study contributes to a new framework, in which the literature is still scarce. That imposes a theoretical and analytical challenge. Thus, criticism must be invited. Other than that, some limitations originate from the design of the work. As a cross-sectional and quantitative study, it has a reductionist tendency since the subjective and contextual aspects of the individuals are not fully considered. The study also lacks an in-depth exploration of the DW dimensions, since these different aspects of DW were not examined individually, but either grouped as profiles.

Other limitations lie in the analysis of the data. Due to the exploratory and seminal nature of the study, cross-cultural and factorial analysis could not be performed entirely, taking into consideration time and length limitations. Additionally, in relation to the health outcomes studied, the variables were drawn from either one (physical pain) or two items, not being able to fully explore the complexity of these variables. Missing values were present in the sample, and losses were imposed in the database.

Future studies

Firstly, since this work encompasses a new theoretical framework, future studies are highly needed. These studies could gain valuable insights by addressing the limitations identified in this research. First, conducting cross-cultural analyses between different regions or countries could provide a broader perspective and uncover interesting cultural differences and similarities in work environments and their impacts. Other than that, exploring more holistic measures for the health outcomes and different health, work, subjective and contextual outcomes in relation to the DW demands and resources would be beneficial. The DW dimensions should also be studied more in-depth, analyzing them individually rather than as a global score.

Additionally, longitudinal investigations are essential to understanding how these relationships evolve over time. Such studies would elucidate the temporal dynamics between DW dimensions and health outcomes. This approach could provide critical insights into the causal pathways that underlie these

associations, helping to determine how specific job demands and resources influence health behaviors over the long term.

Ethics and consent

This research was approved under the Bioethics Commission of the University of Barcelona (Institutional Review Board - IRB00003099) and the Ethics and Research Deontology Committee of the University of Coimbra (CEDI/FPCEUC:53-7-21-08-2021]). It was made in accordance with the European Union legislation in regard to ethics, anonymity/privacy, and security in Social Science and Humanities, and with the European Code of Conduct for Research Integrity (European Federation of Academies of Sciences and Humanities), as well as comprised the European ethical and Privacy Principles. Every participant provided informed consent, and each student compiled a report for every participant, detailing the questionnaire application context, the nature of the student-participant relationship, and any queries or concerns raised by the participant along with the student's responses. Each student signed a declaration of responsibility affirming the accuracy of the collected data.

Data availability

The data and supplementary materials supporting this study have been made publicly available in Zenodo at: https://doi.org/10.5281/zenodo.16920536[57].

The repository contains the following underlying data: the dataset and the questionnaires used in the study.

Data are available under the terms of the Creative Commons Attribution 4.0 International

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Open Peer Review

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✗

William J Fleming
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Thank you for the invitation to review the paper. The idea to integrate the decent work framework with JDR theory is a valuable one so I commend this.

Unfortunately, I have had to recommend not approved for the article because of the data used. The sampling technique - class students gathering surveys from their personal connections and pooling the data - cannot provide external validity and therefore the general empirical claims cannot be supported. This is the major limitation of the study and is not emphasised commensurate with its limitation. Pursuing this idea with representative data could make for a good contribution to the literature on work and wellbeing, but as it is I cannot approved for indexing.

I also have some revisions to recommend in terms of the framing and theory.
In the definitions and details of the decent work framework you ought to specifically frame it around ILO and how that can be supplemented with JDR. I found the movement between ILO/UN definitions of decent work and definitions from academic references hard to follow. For example, in the third paragraph you discuss the ILO, but then move to academic definitions. In the literature review you also discuss ILO definitions but then move to an academic summary without justifying why this is a stronger option. Focusing on the ILO definitions would be most successful here for combining institutional and scientific frameworks, which is where the theoretical contribution can lie.

Relatedly, you must clearly distinguish the ILO indicators of decent work from their constructs and pillars of decent work. Currently the two are conflated in the first three paragraphs of the decent work section of the literature review.

In terms of JDR, how each dimension of decent work operates as both demand and resource has to be explained explicitly, as this is your main theoretical argument. You begin to do this in the literature review but it needs further development. For instance, I would consider pay a resource, with inadequate pay a resource deficiency rather than a demand, as you currently state.

Also you must clarify that JDR is a dynamic theory of balance. Imbalance creates either overload or underload. Balance between demands and resources is needed for optimal wellbeing. As well, the extension of JDR to physical health needs to be better justified. JDR is a psychological model of stress/strain, but here you extend to the physical demands of work.

In terms of analysis, had I recommended revisions I would have asked for your analysis to use OLS regression to estimate the multivariate relationships between your profiles and the health outcomes. Anova and Chi-square are inadequate for the claims you wish to make, with many confounding factors not controlled for.

For a new scale you must provide details of the DWDaRQ survey validation.

I'm sorry not to be able to recommend a better outcome but good luck with your future research on this topic. There is theoretical merit but a higher quality study design is required for indexing.

Is the work clearly and accurately presented and does it engage with the current literature?
Partly

Is the study design appropriate and is the work technically sound?
No

Are sufficient details of methods and analysis provided to allow replication by others?
Yes

Are all the source data and materials underlying the results available?
Partly

If applicable, is the statistical analysis and its interpretation appropriate?
Partly

Are the conclusions drawn adequately supported by the results?
Partly

Competing Interests: No competing interests were disclosed.

Reviewer Expertise: Quantitative research on work and wellbeing

I confirm that I have read this submission and believe that I have an appropriate level of expertise to state that I do not consider it to be of an acceptable scientific standard, for reasons outlined above.