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Symptoms of complicated grief and depression following job loss: Can engagement in non-work activities bring relief?

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Abstract

The present study aimed to examine whether day-level engagement in non-work activities can mitigate the adverse outcomes of job loss. Based on Jahoda's latent deprivation model, we hypothesized that engaging in such activities (e.g., meeting others) can fulfil five basic needs (e.g., need for time structure) and that fulfilment of these needs mitigates the negative consequences of job loss. A diary study was conducted on five consecutive days among 236 participants who had involuntarily lost their job, yielding 1046 daily measures of the time spent on activities, the evaluation of these activities, and emotional distress. Multilevel regression analyses showed that time spent on daily activities was associated with the degree of fulfilment of the basic needs and emotional distress, yet the effect sizes were small. Perceived utility of these daily activities showed more solid effect sizes with the basic needs and emotional distress. However, the mediation effect of the basic needs regarding the association between activities and emotional distress could not be confirmed. The present results suggest that, in addition to stimulating individuals who experience job loss-related emotional distress to undertake certain activities, the evaluation of these activities should also be taken into account in tailor-made interventions and preventive measures.

KEYWORDS
complicated grief, depression, diary study, job loss, latent deprivation model

1 | INTRODUCTION

Most people do not experience long-term negative effects after involuntary job loss (Bonanno et al., 2011; Gowan, 2012). Still, in a significant minority of people, involuntary job loss can lead to high levels of psychological distress (McKee-Ryan et al., 2005), depression (Stolove et al., 2017), and symptoms of grief (Climent-Rodríguez et al., 2019). High levels of grief for a brief period following a job loss, while people are still able to function in their daily life, are considered part of a healthy path towards recovery (Harris, 2020). However, when these grief reactions persist and impede daily functioning, it can evolve in symptoms of job loss-related complicated grief (JLCG; Papa & Lancaster, 2016; Van Eersel et al., 2022a). Drawing on the conceptualization of disordered grief after bereavement loss (Prigerson et al., 2009), JLCG symptoms encompass separation distress, problems accepting the changed reality, yearning for the lost job, identity confusion, difficulties finding meaning in life, bitterness, anger, and difficulties moving on, causing severe psychological distress and dysfunction.

Additional negative effects of job loss include lowered self-esteem, a sense of futility, social isolation, lack of time structure, and loss of a valued societal position (Brand, 2015; Jahoda, 1981; McKee-Ryan et al., 2005). Building on these findings, the present study used a daily diary design to examine whether the adverse effects of involuntary job loss can be mitigated by involvement in non-work-related activities. We assumed that engaging in such activities can fulfil several basic needs—specifically, the needs for purpose in life, affiliation, social status, time structure, and enforced activity (cf. Jahoda, 1981)—and that fulfilment of these needs can counter the adverse effects of job loss (Figure 1). In this vein, we aimed to enhance our knowledge about processes leading to JLCG and depressive symptoms after involuntarily job loss. This knowledge could inform the development of interventions to prevent or reduce the adverse impact of job loss. Doing so is relevant since mental health problems decrease the chances of finding re-employment (e.g., Janssens et al., 2020), and may also lead to stigmatization, social withdrawal (Brand, 2015), and a lower quality of life (Norström et al., 2019).

1.1 | Jahoda's latent deprivation model (LDM)

At the heart of the present study lies a set of assumptions that are based on Jahoda's (1981) latent deprivation model (LDM). Its starting point is that engaging in employment activities can fulfil five basic psychological needs: (1) the need for affiliation (i.e., having social contacts and experiencing a sense of belonging; Wiesenfeld et al., 2001), (2) the need for time structure (i.e., perceiving time as structured and purposive; Van Hoye & Lootens, 2013), (3) the need for social status (i.e., holding a respected place in society; Anderson et al., 2015), (4) the need for purpose in life (i.e., living a meaningful life and engaging in goals that transcend oneself; Bronk, 2013), and (5) the need for enforced activity (i.e., participating in activities to demonstrate or gain competence; Sheldon et al., 1996). According to Jahoda et al. (1933/2002), non-work activities cannot fulfil these basic needs to the same level as paid work activities and, as a result, psychological well-being decreases when a person becomes unemployed. Indeed, Hoare and Machin (2010) found that previously unemployed people experienced higher levels of fulfilment in their need for affiliation and time structure when they were re-employed, compared to the time before they found a new job.

1.2 | The LDM and daily activities

Over the years, scholars have examined the association between involvement in various activities and well-being in the context of the LDM. For instance, experiencing more fulfilment of the *need for social status* was associated with lower levels of depressive symptoms (Yang & Matz, 2020), whereas a lack of fulfilment of *the need for time structure* was associated with lower self-esteem and quality of life (Muller & Waters, 2012). A four-wave study by Selenko et al. (2011) showed that less fulfilment of the basic needs of the LDM led to a decrease of psychological health over 6 months. Specifically, unemployed people who experienced less appreciation from others and a lack of time structure reported a decrease in their psychological well-being.

From the perspective of the LDM, it can be hypothesized that unfulfilled basic needs also play a role in the development and maintenance of JLCG symptoms. Most research in this area has focussed on outcomes such as general mental health or depressive symptoms (Paul et al., 2009; Yang & Matz, 2020). The possible impact of unfulfilled needs on JLCG symptoms has as yet not been taken into account. This is surprising, since the intensity of these symptoms has been found to be related to the disruption in a person's day-to-day life, access to valuable activities, meaningful interactions, social relationships, loss of identity, and low self-esteem (Papa & Lancaster, 2016; Van Eersel et al., 2020, 2021a). The LDM may thus help us

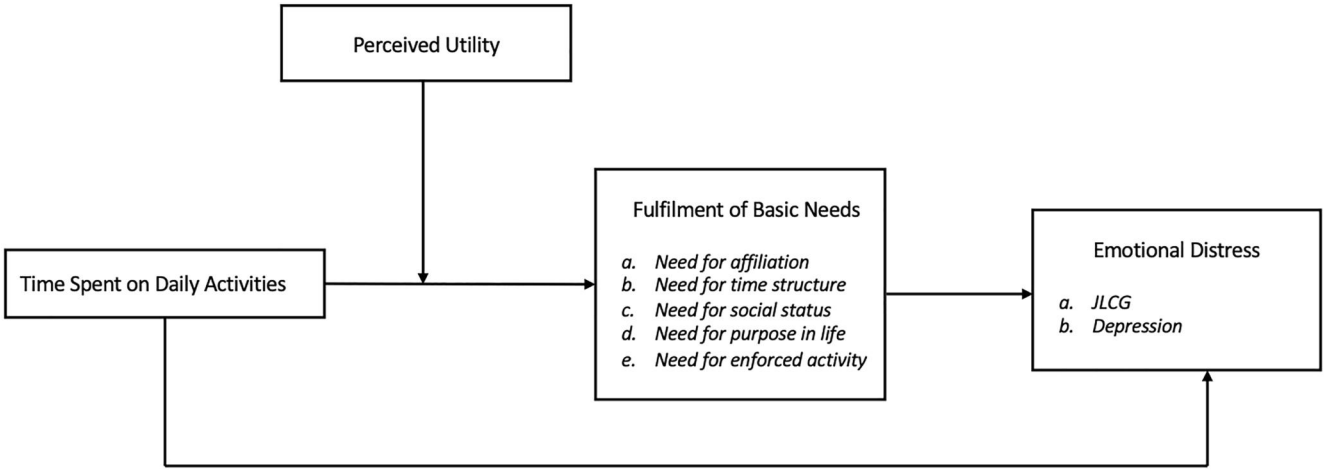

FIGURE 1 Schematic depiction for each activity category in relation to the basic needs, job loss-related CG symptoms, and depression. JLCG, job loss-related complicated grief symptoms. The activity categories, for which this model was tested separately, were: relaxing, social, physical, high-duty, meaningful, and job search activities.

to enlighten the role of non-work-related activities and the fulfilment of basic needs in understanding why some unemployed people continue to experience grief reactions and depression after involuntarily job loss. The first aim of the present student was therefore to map daily variations in the basic needs in relation to symptoms of JLCG and depression.

1.3 | Time spent on daily activities and basic needs

More engagement in activities can contribute to the fulfilment of basic needs (Creed & Bartrum, 2006). For instance, unemployed people who engage in regular volunteer work experience more fulfilment of their *need for purpose in life* (Kamerāde & Bennett, 2018), whereas unemployed people with more social contacts reported higher levels of well-being (Creed & Bartrum, 2006). Relaxing activities can be deployed as a way to avoid the confrontation with the changed reality, while job search activities may be seen as a reminder of everything that has been lost (Harris, 2020). Consequently, it seems plausible that their contribution to the fulfilment of basic needs is limited. Conversely, social, physical, high-duty, and meaningful activities have been found to be related to the fulfilment of basic needs (Creed & Bartrum, 2006; Kamerāde & Bennett, 2018; Muller & Waters, 2012). At present, there is a lack of knowledge on the link between daily fluctuations in the time spent on daily activities in relation to the fulfilment of basic needs. Consequently, the second aim of this study is to test these assumptions, separately for each activity category (Figure 1).

1.4 | Perceived utility of daily activities and basic needs

In general, evidence suggests that when engaging in leisure or enjoyable activities, unemployed people experience less joy than employed people and they report higher levels of sadness on an average day (Krueger & Mueller, 2012). This implies that, in addition to the time spent on daily activities, the *evaluation* of these activities (e.g., in terms of perceived utility) exerts an impact on the subjective well-being of unemployed people (Dittrich & Mey, 2015; Knabe et al., 2010). Therefore, the third aim of this study was to examine the impact of perceived utility for each activity category in relation to the fulfilment of basic needs (Figure 1).

1.5 | LDM as mediation model

The LDM proposes that engaging in employment-related activities can contribute to fulfilment of basic needs which, in turn, have a positive impact on mental health. Indeed, evidence showed that a lower level of fulfilment of basic needs accounted for a higher level of depressive symptoms among unemployed individuals compared to other groups (Paul et al., 2009). Read et al. (2013) found in a sample of retirees that the relation between engagement in meaningful activities on the one hand and quality of life on the other hand, was mediated by the extent of fulfilment of the need for purpose in life. When someone experienced more purpose through the conducted activity, they reported a higher quality of life. Thus, the fourth aim of this study was to examine if the association between the time spent on and the perceived utility of an activity category on the one hand and emotional distress on the other hand, was mediated by the degree to which the basic needs of the LDM were fulfiled.

1.6 | Present study

At present, it is unclear to what extent common daily activities (e.g., household chores or exercising) can fulfil basic needs among unemployed individuals and to what extent fulfilment of these needs is associated with symptoms of JLCG and depression within this group. These insights can inform the development of early interventions to reduce the emotional distress after involuntarily job loss. Furthermore, to our knowledge, the LDM has only been tested with surveys that require retrospective recall over the last weeks or months (e.g., Muller & Waters, 2012; Selenko et al., 2011; Yang & Matz, 2020). Retrospectively reporting reactions and events is prone to memory bias (Ellison et al., 2020). In the current study this risk were reduced by using a daily diary design to obtain more accurate results. This approach helped to unravel the relations between daily activities, the LDM, depression, and JLCG symptoms more accurately.

For this aim we tested the following hypotheses in this study. In line with Selenko et al. (2011), we expected that the degree of fulfilment of the basic needs (affiliation, time structure, social status, purpose in life, and enforced activity) was negatively related to the symptoms of (a) JLCG and (b) depression (Hypothesis 1). As schematically depicted in Figure 1, we expected that the amount of time spent on (a) relaxing and (b) job search activities was negatively related to the fulfilment of basic needs (Hypothesis 2). Similarly, we expected that the amount of time spent on (a) social, (b) physical, (c) high-duty, and (d) meaningful activities, was positively related to the fulfilment of basic needs (Hypothesis 3). Regarding the perceived utility of the six daily activity types, we expected to find positive relations with the fulfilment of basic needs (Hypothesis 4). Finally, we expected that the degree of fulfilment of the basic needs mediated the association of the time spent on an activity and its perceived utility on the one hand and symptoms of JLCG and depression on the other hand (Hypothesis 5). This was tested for all activity categories separately.

2 | METHOD

2.1 | Study design

A diary study was conducted on five consecutive days to gather data on symptoms of JLCG and depression, the fulfilment of basic needs

proposed in the LDM, the amount of time spent on activities the participants engaged in, and the perceived utility of these activities.

2.2 | Procedure and participants

The Ethical Review Board of the Faculty of Social and Behavioural Sciences of Utrecht University (FETC 19–108) approved this study. Dutch individuals who involuntarily lost their job were recruited via social media and social networks. All eligible participants were required to be currently unemployed and available for work. People who were interested in the study could click on a link to read the information letter. They were then asked whether they wanted to participate in the study. After signing the informed consent form, 236 participants (92%) continued with the study in a secured online area (Qualtrics) where they completed daily questionnaires on five consecutive days (taking approximately 5 min each day). Out of these 236 participants, 179 participants (78%) completed questionnaires on 5 days, 23 participants (10%) on 4 days, eight participants (4%) on 3 days, nine participants (4%) on 2 days, and 17 participants (7%) on 1 day. Twenty-six participants did not fill out the socio-demographic and work characteristics section.

Participants in the present sample were on average 52.4 years old (SD = 8.4). The sample consisted of 44 males (21%) and 166 females (79%). There were no significant differences between males and females for socio-demographics or work characteristics, except for age; males were older (M = 54.7 years) than females (M = 51.8 years; t (208) = 2.02, $p < 0.05$). In total 73 people (35%) had attended primary and/or secondary education only, while 137 people (65%) held a college or university degree. They had lost their job due to personal reasons (e.g., illness or a labour conflict; n = 95, 45%) or situational reasons (e.g., a reorganization or a bankruptcy; n = 115, 55%). The average duration of employment in their lost job was 9.5 years (SD = 9.8) and the average number of contract hours per week was 32.4 (SD = 19.2). Time passed since participants had lost their job was 14.1 months (SD = 21.2); 25% had lost their job within the last month, 50% had lost their job within the last 6 months, and 75% had lost their job within the last 18 months.

2.3 | Instruments

2.3.1 | Demographics

Data on socio-demographics (e.g., age, gender, education) and work features (e.g., reason for job loss, elapsed time since job loss, length of employment) were collected.

2.3.2 | Daily activities

At the end of each day, participants were asked to respond to the items of the daily survey. We provided participants with short descriptions of six activity categories, drawing on Sonnentag's (2001) measure of nonwork/leisure activities of employed people. The categories were: (a) relaxing activities (e.g., taking a bath or spending time on social media), (b) social activities (e.g., meeting others or calling someone to chat), (c) physical activities (e.g., exercising or dancing), (d) high-duty activities (e.g., household chores or taking care of family members), (e) meaningful activities (e.g., volunteering or studying), and (f) job searching (e.g., searching for vacancies or going to network events).

For each category, participants were instructed to report whether they had undertaken any activities listed in that category (yes or no). If not, they proceeded with the items in the next category. If so, they were asked to register the time (in minutes) spent on this activity and its perceived utility (tapped using the question 'I found this useful', 1 = *strongly disagree*, 5 = *strongly agree*).

Next, six further items were included in the daily measures, all rated on a 5-point scale (1 = *strongly disagree*, 5 = *strongly agree*). *Daily depression* was measured with a single item, 'Today I felt depressed'. *Daily JLCG symptoms* were measured with five items from the Job Loss Grief Scale (JLGS; Van Eersel et al., 2019), namely 'Today I thought so much about my former job that it was hard for me to do the things I normally do', 'Today I felt a strong longing for my former job', 'Today I was angry about losing my job', 'Today I felt that my life could only be meaningful with my former job', and 'Today memories of losing my job upset me'. A multilevel factor analysis showed that the explained variances for the daily JLGS items were 66% on day 1, 67% on day 2, 59% on day 3, 62% on day 4%, and 55% on day 5. Factor loadings across the 5 days ranged from 0.72 to 0.86. In the present sample Cronbach's α for the daily JLGS ranged from 0.89 to 0.91 for all 5 days.

Basic needs were measured over the entire day with five items, namely one item for each of the five subscales of the Latent and Manifest Benefits–Shortened version (Kovacs et al., 2019), rated on a 5-point scale (1 = *strongly disagree* to 5 = *strongly agree*). The items were translated to Dutch by three experts in the field of psychology and back translated into English by the second author (cf. Tyupa, 2011), which led to some minor changes in the Dutch item wordings. The items were: 'Today I felt I made a meaningful contribution to society' (need for purpose in life), 'Today I had the opportunity to meet other people' (need for affiliation), 'Today I was appreciated by those around me' (need for social status), 'Today I would have liked to have more things to do to fill the day' (need for time structure), and 'Today there was a good balance between my responsibilities and free time' (need for enforced activity).

2.4 | Statistical analyses

2.4.1 | Preliminary analyses

The data collection took place from October 2019 up to March 2021. At the start of this study there were 432,000 unemployed individuals on population of 17 million in the Netherlands, this number fluctuated throughout the study to 388,000 in March 2020 to 439,000 in March 2021 (CBS, 2021). In the middle of this period

the COVID-19 pandemic broke out, likely affecting the daily lives of the participants. We therefore tested if there were differences on the study variables between participants who completed the study prior to the first lockdown in the Netherlands (17 March 2020) and those who completed the study thereafter (labelled the 'pre-covid' group, $n = 114$, and the 'during-covid' group, $n = 122$). We found no significant differences between these groups for the socio-demographics and job characteristics, except for the time elapsed since job loss: the 'pre-covid' group had been without a job longer ($M = 20.9$, $SD = 26.2$ months) than the 'during-covid' group ($M = 9.3$, $SD = 16.3$ months; $t(136) = 3.67$, $p < 0.001$, $\eta^2 = 0.06$). However, prior research has shown that time passed since job loss is not a risk factor for JLCG symptoms (Papa & Maitoza, 2013; Van Eersel et al., 2021b). The time spent on daily activities was similar for both groups, apart from high-duty activities. The 'pre-covid' group spent more time on high-duty activities ($n = 359$, $M = 2.4$, $SD = 2.1$ h) than the 'during-covid' group ($n = 499$, $M = 2.1$, $SD = 1.6$ h; t (641) = 2.87, $p < 0.01$, $\eta^2 = 0.01$). As for the basic needs, both groups showed significant differences on two basic needs. The 'pre-covid' group scored slightly higher ($n = 435$, $M = 3.6$) on the need for affiliation than the 'during-covid' group ($n = 611$, $M = 3.3$; $t(1044) = 4.03$, $p < 0.001$, $\eta^2 = 0.02$). Further, the 'pre-covid' group also scored slightly higher ($n = 435$, $M = 3.6$) on the need for time structure than the 'during-covid' group ($n = 611$, $M = 3.4$; $t(1044) = 3.00$, $p < 0.01$, $\eta^2 = 0.001$). As there were only minor differences between the two groups, they were combined in the analyses.

Mplus version 8.5 was used for the data analysis (Muthén & Muthén, 1998–2017). Since the daily measurements took place on five consecutive days for each participant, the observations were nested within participants so using multilevel analysis was warranted (Hox et al., 2018). In the present sample, the intraclass correlation coefficients indicated that 74% of the variance in JLCG symptoms and 55% of the variance in depression symptoms could be attributed to within-person fluctuations. For the basic needs, the ICCs indicated that respectively 43% (purpose in life), 24% (affiliation), 33% (social status), 53% (time structure), and 38% (enforced activity) of the variance could be explained by within-person fluctuations. These results underline the importance of taking a multilevel approach when testing the hypotheses.

2.4.2 | Main analyses

For all analyses, the Bayesian estimator with at least 20,000 iterations was selected. Contrary to traditional estimation methods, Bayesian estimation can be used in small samples and for complex analyses, since this approach provides proper estimates and does not require the data to be normally distributed (Hox et al., 2018). The full dataset was used for the analyses ($N = 236$ participants, $n = 1046$ daily measures). This sample size is sufficiently large to conduct analyses in a so-called *long* format (i.e., cross-sectional analyses), but too small for analyses in a *wide* format (i.e., longitudinal analyses; Hox et al., 2018). The data set is freely retrievable (Van Eersel et al., 2022b).

Hypothesis 1 was tested in a multilevel regression analysis with the five basic needs as independent variables and JLCG symptoms and depression as dependent variables. To test Hypotheses 2 through 5, separate analyses were run for each of the six activity categories (relaxing, social, physical, high-duty, meaningful, and job search activities). Each model was built up step by step to compare the models for best fit, using the deviance information criterion (DIC). Smaller DIC values indicate a better model fit (Muthén, 2010). For each of the six activity categories the base model (Model 0) included the five basic needs and JLCG and depression symptoms. The time spent on this particular activity was added in Model 1. In Model 2, the perceived utility of this activity category was added. Finally, in Model 3 the interaction between the time spent on, and the perceived utility of this activity was added.

To test Hypotheses 2 through 4 multilevel regression analyses were conducted for each separate activity, with time spent on the activity, perceived utility, and the interaction effect between spent time and perceived utility as independent variables, and the five basic needs as dependent variables. Hypothesis 5 was tested with multilevel regression analyses for each activity, with time spent on and perceived utility of the activity as independent variables, the five basic needs as mediators, and JLCG symptoms and depression as dependent variables.

3 | RESULTS

3.1 | Descriptive statistics

Table 1 shows the means and standard deviations of JLCG symptoms, depressive symptoms, basic needs, and the time spent on each of the six daily activities. Considering the data from all 1046 daily measures, participants undertook relaxing activities on 968 days (93%), social activities on 737 days (71%), physical activities on 687 days (66%), high-duty activities on 858 days (82%), meaningful activities on 475 days (45%), and job search activities on 443 days (42%).

3.2 | Basic needs, JLCG, and depression

Table 2 shows the results of the analyses examining the associations between the fulfilment of the five basic needs and symptoms of JLCG and depression. Three of these needs, 'social status', 'time structure', and 'enforced activity', were significantly associated with JLCG symptoms. This partially confirmed Hypothesis 1a; there was a negative relation between the fulfilment of most basic needs and JLCG symptoms. With regard to depressive symptoms, all basic needs showed significant negative relationships with depression, except the need for affiliation. This largely confirmed Hypothesis 1b, stating that there was a negative relation between most basic needs and depression symptoms.

TABLE 1 Descriptive statistics of the study variables

	Total		Day 1		Day 2		Day 3		Day 4		Day 5	
	N	*M* (*SD*)	*N*	*M* (*SD*)	*N*	*M* (*SD*)	*N*	*M* (*SD*)	*N*	*M* (*SD*)	*N*	*M* (*SD*)
Emotional distress												
JLCG	1046	10.5 (4.7)	227	11.2 (4.8)	209	10.6 (4.8)	209	10.3 (4.7)	202	10.2 (4.5)	199	10.3 (4.4)
Depression	1046	2.3 (1.2)	227	2.4 (1.2)	209	2.4 (1.2)	209	2.3 (1.1)	202	2.4 (1.2)	199	2.3 (1.1)
Basic needs												
Purpose in life	1046	2.7 (1.1)	227	2.6 (1.1)	209	2.7 (1.1)	209	2.8 (1.0)	202	2.8 (1.0)	199	2.8 (1.0)
Affiliation	1046	3.4 (1.1)	227	3.2 (1.2)	209	3.4 (1.1)	209	3.5 (1.1)	202	3.4 (1.1)	199	3.4 (1.1)
Social status	1046	3.6 (0.9)	227	3.5 (0.9)	209	3.7 (0.9)	209	3.6 (0.9)	202	3.6 (0.9)	199	3.7 (0.8)
Time structure	1046	3.5 (1.2)	227	3.3 (1.2)	209	3.4 (1.2)	209	3.6 (1.1)	202	3.5 (1.1)	199	3.6 (1.2)
Enforced activity	1046	3.1 (1.0)	277	3.1 (1.0)	209	3.2 (1.0)	209	3.2 (1.0)	202	3.1 (1.0)	199	3.2 (1.0)
Spent time in hours												
Relaxing activities	968	4.2 (2.7)	215	5.0 (2.9)	197	4.4 (2.6)	188	4.4 (2.6)	185	3.9 (2.3)	183	3.6 (2.7)
Social activities	737	2.8 (2.0)	165	2.8 (1.8)	152	2.7 (1.8)	153	3.0 (2.3)	136	2.9 (2.2)	131	2.8 (2.1)
Physical activities	687	1.5 (1.0)	155	1.5 (1.0)	131	1.5 (1.1)	137	1.5 (1.1)	137	1.5 (0.9)	127	1.5 (1.0)
High-duty activities	858	2.2 (1.8)	189	2.4 (2.1)	184	2.2 (1.6)	166	2.1 (1.8)	161	2.1 (1.6)	158	2.2 (1.9)
Meaningful activities	475	2.6 (2.0)	114	2.5 (1.8)	90	2.7 (2.1)	85	2.6 (2.2)	92	2.3 (1.6)	94	2.7 (2.1)
Job search activities	443	1.7 (1.3)	106	1.5 (1.0)	78	1.8 (1.3)	89	1.6 (1.3)	85	1.8 (1.7)	85	1.7 (1.2)

Abbreviation: JLCG, job loss-related complicated grief symptoms.

TABLE 2 Multilevel analyses of associations between the fulfilment of basic needs and levels of JLCG and depression

	β	*SD*	95% CI lower 2.5%	95% CI upper 2.5%
JLCG				
Need for purpose in life	0.06	0.03	−0.02	0.13
Need for affiliation	−0.03	0.04	−0.10	0.05
Need for social status	−0.11**	0.04	−0.19	0.03
Need for time structure	−0.16***	0.04	−0.22	−0.09
Need for enforced activity	−0.09**	0.04	−0.17	−0.02
Depression				
Need for purpose in life	−0.10**	0.04	−0.17	−0.03
Need for affiliation	−0.04	0.04	−0.12	−0.03
Need for social status	−0.18***	0.04	−0.26	−0.10
Need for time structure	−0.19***	0.03	−0.26	−0.13
Need for enforced activity	−0.21***	0.04	−0.28	−0.14

Abbreviations: CI, confidence interval; JLCG, job loss-related complicated grief symptoms.
**$p < 0.01$, ***$p < 0.001$.

3.3 | Preliminary model testing

Before testing Hypotheses 2 through 5, Models 0 through 3 were tested separately for each of the six activity categories and were compared to determine the best-fitting model. Model 0 with the basic needs, JLCG symptoms, and depression had a good fit to the data ($p < 0.001$). In Model 1, the time spent on the activity was added to Model 0. Table 3 shows that, for all six activity categories, this led to increases in DIC values compared to the Model 0. In Model 2, the perceived utility of the activity was added to the variables of Model 1, which led to a decrease of DIC values across all six activities and an improvement of model fit. For Model 3, on top of the variables included in Model 2, the interaction effect between spent time and perceived utility was added, which led to some minor changes in DIC values (Table 3). For all six activities, ΔDIC was below 7, indicating no significant difference between the model without (Model 2) and with

TABLE 3 Multilevel fit indices for Models 0–4, for six activity categories

	Number of free parameters	DIC	PPC 95% CI	PPC *p*-value
Base model (for all six activity categories)				
Model 0: basic needs, JLCG, depression	43	20,921	562–665	<0.001
Relaxed activities				
Model 1: base model, time	32	24,190	876–923	<0.001
Model 2: base model, time, utility	39	20,769	618–670	<0.001
Model 3: base model, time, utility, t × u	46	20,777	613–670	<0.001
Social activities				
Model 1: base model, time	32	23,986	788–835	<0.001
Model 2: base model, time, utility	39	15,768	395–447	<0.001
Model 3: base model, time, utility, t × u	46	15,779	391–450	<0.001
Physical activities				
Model 1: base model, time	32	24,151	861–908	<0.001
Model 2: base model, time, utility	39	14,835	468–522	<0.001
Model 3: base model, time, utility, t × u	46	14,845	465–522	<0.001
High-duty activities				
Model 1: base model, time	32	24,190	884–931	<0.001
Model 2: base model, time, utility	39	18,765	593–647	<0.001
Model 3: base model, time, utility, t × u	46	18,761	586–642	<0.001
Meaningful activities				
Model 1: base model, time	32	24,219	849–896	<0.001
Model 2: base model, time, utility	39	10,755	350–404	<0.001
Model 3: base model, time, utility, t × u	46	10,763	347–405	<0.001
Job search activities				
Model 1: base model, time	32	24,201	880–925	<0.001
Model 2: base model, time, utility	39	9674	314–368	<0.001
Model 3: base model, time, utility, t × u	46	9677	312–370	<0.001

Abbreviations: DIC, deviance information criterion; JLCG, job loss-related complicated grief symptoms; PPC, posterior predictive checking; t × u, interaction effect of spent time and perceived utility of the activity.

an interaction term (Model 3; cf. Cain & Zhang, 2019). Hence, Model 2 was retained for all six activity categories. Accordingly, only the main effects of the activities (time spent and perceived utility) were included in the separate models for each activity category to test Hypotheses 2 through 5, as schematically depicted in Figure 2.

3.4 | Daily activities and basic needs

3.4.1 | Time spent on activities and need fulfilment

Table 4 shows the results for the time spent on each activity category and the degree to which the five needs are fulfiled. For *relaxing activities*, we found that the time spent on this particular activity was negatively related to three of the basic needs, namely purpose in life ($\beta = -0.09$), affiliation ($\beta = -0.08$), and social status ($\beta = -0.08$), confirming Hypothesis 2a. For *job search activities*, there were no significant relations between the time spent on this activity and the basic needs, hence Hypothesis 2b could not be confirmed. For *social activities* significant positive relations were found between the time spent on these activities and the needs for affiliation ($\beta = 0.17$), social status ($\beta = 0.18$), time structure ($\beta = 0.08$), and enforced activity ($\beta = 0.09$), confirming Hypothesis 3a. For *physical activities* only one significant positive relation emerged, namely that between time spent on these activities and the need for enforced activity ($\beta = 0.13$), partially confirming Hypothesis 3b. For *high-duty activities* also one significant positive relation was found between the time spent on this activity and the need for time structure ($\beta = 0.08$), partially conforming Hypothesis 3c. Finally, regarding *meaningful activities*, the time spent on these activities was associated with the needs for purpose in life ($\beta = 0.21$) and affiliation ($\beta = 0.14$), partially confirming Hypothesis 3d.

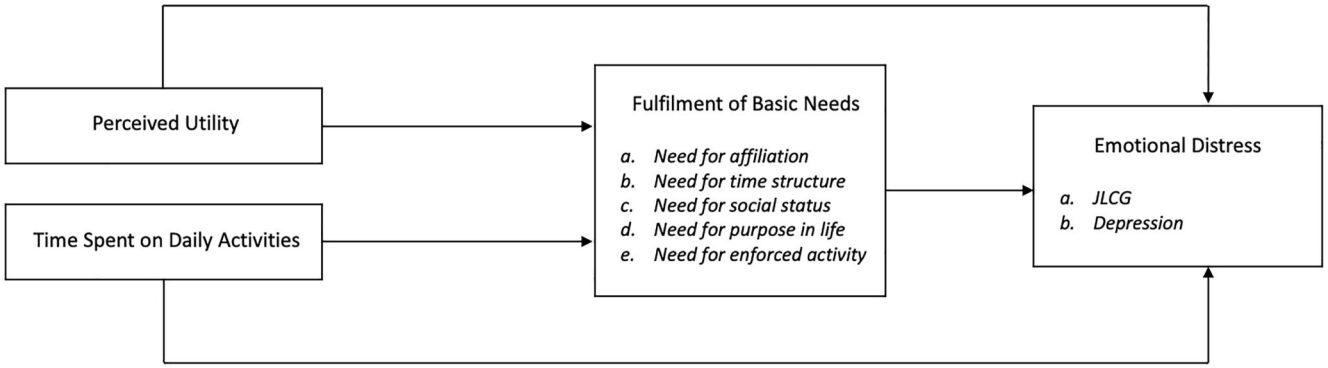

FIGURE 2 Adjusted schematic depiction based on the results of the preliminary model testing. JLCG, job loss-related complicated grief symptoms. The activity categories, for which this model was tested separately, were: relaxing, social, physical, high-duty, meaningful, and job search activities.

TABLE 4 Multilevel analysis of the effects of activity types on need fulfilment (Model 2)

	Activity category											
	Relaxing $n = 915$		Social $n = 706$		Physical $n = 658$		High-duty $n = 822$		Meaningful $n = 462$		Job search $n = 422$	
	β	*SD*	*β*	*SD*	*β*	*SD*	*β*	*SD*	*β*	*SD*	*β*	*SD*
Basic needs												
Purpose in life												
Spent time on activity	**−0.09****	**0.03**	0.04	0.04	0.03	0.04	0.04	0.03	**0.21*****	**0.04**	0.02	0.05
Utility activity	**0.30*****	**0.03**	**0.28*****	**0.03**	**0.13*****	**0.03**	**0.16*****	**0.03**	**0.14****	**0.04**	**0.10***	**0.05**
Affiliation												
Spent time on activity	**−0.08****	**0.04**	**0.17*****	**0.04**	0.05	0.04	0.03	0.03	**0.14****	**0.05**	0.05	0.05
Utility activity	**0.25*****	**0.03**	**0.15*****	**0.04**	**0.08***	**0.04**	**0.13*****	**0.03**	**0.19*****	**0.05**	**0.11***	**0.05**
Social status												
Spent time on activity	**−0.08****	**0.03**	**0.18*****	**0.04**	0.04	0.04	−0.03	0.03	0.07	0.05	0.01	0.05
Utility activity	**0.27*****	**0.03**	**0.21*****	**0.04**	**0.25*****	**0.04**	**0.21*****	**0.03**	**0.20*****	**0.04**	**0.13****	**0.05**
Time structure												
Spent time on activity	−0.02	0.03	**0.08***	**0.04**	0.04	0.05	**0.08***	**0.03**	0.05	0.05	−0.05	0.05
Utility activity	**0.19*****	**0.03**	**0.07***	**0.04**	**0.17*****	**0.04**	**0.18*****	**0.03**	**0.13****	**0.04**	**0.22*****	**0.05**
Enforced activity												
Spent time on activity	0.01	0.03	**0.09****	**0.04**	**0.13*****	**0.04**	−0.05	0.03	0.07	0.05	−0.01	0.05
Utility activity	**0.30*****	**0.03**	**0.21*****	**0.04**	**0.17*****	**0.04**	**0.17*****	**0.03**	**0.19*****	**0.04**	**0.11***	**0.05**

*$p < 0.05$, **$p < 0.01$, ***$p < 0.001$.

3.4.2 | Utility and need fulfilment

Hypothesis 4 stated that there would be positive relations between the perceived utility of the six daily activity types and the fulfilment of the basic needs. In support of this assumption, there were positive significant relations between the perceived utility of *all* six activities and *all* five basic needs, with *β*s ranging from 0.07 to 0.30, median $\beta = 0.19$. Highest betas for utility of all basic needs were shown for relaxing activities. These findings confirmed Hypothesis 4.

3.5 | Mediation effects

Figure 1 schematically depicts a mediation model in which the effects of involvement in particular activities on symptom levels of JLCG and depression are mediated by the degree to which five basic needs are fulfiled. Table 5 summarizes the outcomes of the analyses testing the paths in the mediation and non-mediation model. To examine the effects of the basic needs as mediators, first the *direct paths in the non-mediation model* (path C in Table 5) between the time spent on,

TABLE 5 Multilevel mediation analyses between JLCG, depression, fulfilment of basic needs and daily activities

	Path	Relaxing $n = 915$ β	Social $n = 706$ β	Physical $n = 658$ β	High-duty $n = 822$ β	Meaningful $n = 462$ β	Job search $n = 422$ β
Time → JLCG							
Time → JLCG	c	−0.05	−0.05	−0.06	0.02	**−0.08***	−0.01
Time → JLCG	c'	−0.05	<0.01	−0.02	0.02	−0.06	−0.02
Time → need for purpose in life → JLCG	a × b	**−0.01****	<0.01	<0.01	0.01	**0.02***	<0.01
Time → need for affiliation → JLCG	a × b	**0.01****	**−0.02****	**−0.01***	<0.01	**−0.03****	−0.01
Time → need for social status → JLCG	a × b	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Time → need for time structure → JLCG	a × b	<0.01	**−0.02***	−0.01	**−0.01***	<0.01	0.01
Time → need for enforced activity → JLCG	a × b	<0.01	**−0.02****	**−0.03*****	0.01	−0.02	<0.01
Time → depression							
Time → depression	c	0.02	**−0.14*****	**−0.10****	−0.01	−0.06	0.04
Time → depression	c'	<0.01	**−0.08***	**−0.06***	−0.01	−0.02	0.03
Time → need for purpose in life → depression	a × b	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Time → need for affiliation → depression	a × b	<0.01	**−0.01***	<0.01	<0.01	−0.01	−0.01
Time → need for social status → depression	a × b	**0.01****	−0.01	<0.01	<0.01	<0.01	<0.01
Time → need for time structure → depression	a × b	<0.01	**−0.02***	−0.01	**−0.01***	−0.01	0.01
Time → need for enforced activity → depression	a × b	<0.01	**−0.02****	**−0.02*****	0.01	−0.02	<0.01
Utility → JLCG							
Utility → JLCG	c	**−0.17*****	**−0.12****	**−0.21*****	**−0.13*****	**−0.22*****	**−0.20*****
Utility → JLCG	c'	**−0.08****	**−0.07***	**−0.16*****	**−0.07***	**−0.15*****	**−0.16*****
Utility → need for purpose in life → JLCG	a × b	**0.04*****	**0.03****	0.01	**0.02****	**0.02***	**0.01***
Utility → need for affiliation → JLCG	a × b	**−0.03****	**−0.01****	**−0.01***	**−0.02****	**−0.04*****	**−0.02***
Utility → need for social status → JLCG	a × b	−0.01	−0.01	<0.01	<0.01	0.01	0.01
Utility → need for time structure → JLCG	a × b	**−0.03*****	**−0.02***	**−0.02****	**−0.03*****	−0.01	**−0.03****
Utility → need for enforced activity → JLCG	a × b	**−0.06*****	**−0.04*****	**−0.04*****	**−0.04*****	**−0.01*****	**−0.02***
Utility → depression							
Utility → depression	c	**−0.29*****	**−0.21*****	**−0.22*****	**−0.18*****	**−0.25*****	**−0.25*****
Utility → depression	c'	**−0.14*****	**−0.12****	**−0.12****	**−0.07***	**−0.16*****	**−0.13****
Utility → need for purpose in life → depression	a × b	−0.02	**−0.02***	**−0.01***	−0.01	<0.01	<0.01
Utility → need for affiliation → depression	a × b	−0.01	**−0.01***	−0.01	**−0.02****	−0.01	**−0.02***
Utility → need for social status → depression	a × b	**−0.04*****	−0.01	**−0.02***	**−0.02****	−0.01	<0.01

TABLE 5 (Continued)

	Path	Relaxing $n = 915$ β	Social $n = 706$ β	Physical $n = 658$ β	High-duty $n = 822$ β	Meaningful $n = 462$ β	Job search $n = 422$ β
Utility → need for time structure → depression	a × b	**−0.03*** **	**−0.02***	**−0.03*** **	**−0.03*** **	**−0.02****	**−0.05*** **
Utility → need for enforced activity → depression	a × b	**−0.06*** **	**−0.04*** **	**−0.03*** **	**−0.04*** **	**−0.05*** **	**−0.01***
Total of all indirect paths		−0.22***	−0.26***	−0.22***	−0.52***	−0.22***	−0.12**
Total of all paths		−0.22***	−0.53***	−0.59***	−0.98***	−0.61***	−0.39***

Abbreviation: JLCG, job loss-related complicated grief symptoms.
*$p < 0.05$, **$p < 0.01$, ***$p < 0.001$.

and the perceived utility of an activity category on the one hand and JLCG and depression symptoms on the other hand were tested, for each activity separately. The time spent on meaningful activities ($\beta = -0.08$) was significantly associated with JLCG; the time spent on social contacts ($\beta = -0.14$) and physical activities ($\beta = -0.10$) was significantly associated with depression. Considering the perceived utility, it was found that the perceived utility was significantly associated both with JLCG and depression, with the standardized effect size (β) ranging from −0.01 to −0.06.

Considering the associations between the amount of time spent on the daily activities on the one hand and levels of JLCG and depression on the other hand, most *direct pathways in the mediation model* (path C′ in Table 5) showed a small decrease of magnitude or remained the same compared to the direct path in the non-mediation model (path C). All direct paths (path C′) from perceived utility to JLCG and depression showed a small decrease in magnitude compared to the direct paths in the non-mediation model (path C). This could imply a small partial mediation effect for all paths, although the standardized effects of the indirect paths (path A × B) were low (≤0.06). More specifically, for the association between the time spent and JLCG via the fulfilment of basic needs, the effects varied from <0.01 to 0.03, and only one third of the paths were significant. For the association between the amount of time spent on the activities and depression via the fulfilment of basic needs, the effects were even smaller (<0.01–0.02), and only six paths (i.e., 20%) were significant. For the association between the level of perceived utility and JLCG as well as depression via basic needs, the effects sizes increased slightly (<0.01 to 0.06) and more than two thirds of these paths showed a significant result. Still, the effect sizes were too small to confirm the mediation effect of basic needs (Hypothesis 5).

4 | DISCUSSION

The aim of this study was to explore the extent to which Jahoda's (1981) LDM could account for the linkage of daily activities and symptom levels of JLCG and depression following involuntarily job loss. Multilevel analyses were conducted to examine the degree to which engagement in daily activities on the one hand was related to symptoms of JLCG and depression on the other hand, and if emerging associations were mediated by the degree to which participants felt that these activities fulfiled the basic needs specified in the LDM.

Taken together, the results show a negative relation between the fulfilment of most basic needs and JLCG symptoms. Similar results were found for the fulfilment of most basic needs and depression symptoms. Overall, out of the 30 associations between activities and need fulfilment that were considered, 11 (i.e., 37%) provided statistically significant support for the notion that the time spent on a particular activity is related to the degree to which the five basic needs are fulfiled. These relationships can be negative (e.g., the higher the involvement in relaxing activities, the lower the need fulfilment) or positive (more involvement in meaningful, social and—to some degree—high-duty and physical activities, is associated with higher need fulfilment). Furthermore, when participants found the time invested in a particular activity useful, they were likely to report higher levels of need fulfilment. Unfortunately, the mediation of the basic needs between daily activities on the one hand and symptoms of JLCG and depression on the other hand could not be confirmed as the effect sizes were too small.

One of the main findings arising from this study concerns the negative relations between most basic needs and symptoms of JLCG and depression. We found that the more these needs were satisfied, the lower the levels of JLCG and depression. This is consistent with prior findings highlighting an association between lack of fulfilment of basic needs and emotional distress (Muller & Waters, 2012) and depression (Yang & Matz, 2020). Yet, the association between basic needs and JLCG symptoms provides new information. Interestingly, stronger fulfilment of the 'need for purpose in life' showed a negative relation to depression, but was unrelated to JLCG symptoms. This implies that there is a difference in the underlying mechanism of depression and JLCG symptoms, which adds to prior evidence that JLCG symptoms and depression are distinct phenomena (Papa & Maitoza, 2013; Van Eersel et al., 2019, 2021b).

A second main finding involves the positive and negative relationships between the *time spent* on all activities (except 'job searching') and the degree to which these activities fulfiled the basic needs. In other words, higher involvement in relaxing activities was

associated with less fulfilment of the basic needs, whereas longer engagement in social, physical, high-duty, and meaningful activities was associated with higher fulfilment of the basic needs. Although, the effect sizes were relatively low, indicating that the associations between the time spent on activities and the fulfilment of basic needs was not particularly strong. In addition, the direct relation between the time spent on an activity and the level of emotional distress also showed predominantly non-significant results and low effect sizes. This is noteworthy, since these results contradict common assumptions underlying interventions like behavioural activation, proposing that unemployed individuals should undertake 'healthy' activities for a certain amount of time to reduce emotional distress (Martell et al., 2013; Papa et al., 2013).

Third, compared to the time spent on daily activities, their *perceived utility* had a more solid connection to the basic needs, with positive associations for all daily activities. Thus, when individuals perceive an activity as useful, they will experience greater fulfilment of the basic needs. The direct relation between perceived utility and negative symptoms also showed negative relationships; the more individuals evaluated an activity as useful, the lower levels of JLCG and depression symptoms they experienced. This implies that the *evaluation* of an activity has a stronger impact on the fulfilment of basic needs and the level of emotional distress than the time that was *actually spent* on this activity. Although some studies among working and non-working individuals showed that a positive evaluation of activities was positively related to well-being (e.g., Abou-Zeid & Ben-Akiva, 2012; Dittrich & Mey, 2015), so far this assumption was not tested in the context of daily activities in a diary design or for symptoms of JLCG and depression.

Finally, the mediation analyses showed positive associations between time spent and perceived utility of activities on the one hand and the fulfilment of basic needs on the other hand, as well as negative associations between the fulfilment of basic needs and symptoms of JLCG and depression. However, the corresponding effect sizes in the present study were low, which indicates that the degree to which the LDM can account for the relation between daily activities and emotional distress following job loss is limited. To some degree this is unexpected, since the LDM is a well-established theory to explain negative effects of unemployment (e.g., Allan et al., 2020; Creed & Bartrum, 2006). Prior research which identified positive relations between engagement in activities, basic needs, and well-being (e.g., Hoare & Machin, 2010; Muller & Waters, 2012) were based on questionnaires where the participants had to reconstruct their affective experience retrospectively. In a daily diary study participants can draw directly from their episodic memory without having to reconstruct their experience based on other information, which reduces the risk of memory bias (Bakker et al., 2013). The current findings indicate that when basic needs are measured within the moment instead of retrospectively, their relation with daily activities and emotional distress is considerably smaller than when measured retrospectively. This could suggest that findings reported in previous retro perspective designed studies are to some degree due to memory biases.

4.1 | Limitations

Several limitations of this study need to be mentioned. First, the data from the different days were evaluated between persons, without taking the within-person effects into account (cf. Taris et al., 2021). Specifically, the possible effects of JLCG and depression on the type of activities and the evaluation of these activities on the next day were not considered, since the current data were analyzed in a *long* format instead of *wide* format. As this was the first diary study on this topic, we included different types of activities a person can undertake after job loss, in addition to JLCG and depression symptoms. In further research a selection could be made from these variables, to make the analyses less complex, to examine the influence of emotional distress on daily activities and their evaluation on the next day, or vice versa.

Second, we did not consider intrapersonal and contextual factors that might have affected the engagement in activities and symptom levels observed in this study. It seems likely that the baseline level for JLCG and depressive symptoms on which a person starts the study, can affect the daily fluctuations of emotional distress, as well as what type of activities someone undertakes. For example, depressed participants may be relatively inactive, making it difficult to detect effects of daily activities on emotional distress due to restriction of the range of the time spent on these activities. In addition, it would be interesting for future research if participants themselves would categorize the activities, and indicate per category which basic needs are fulfiled by that specific activity. For instance, care tasks are categorized as a high-duty activity in the present research, while someone with a high level of family orientation might categorize this activity as a meaningful activity (Nomaguchi & Milkie, 2020).

Third, in the midst of the period of data collection the world was confronted with the COVID-19 pandemic. The extraordinary measures that were taken to increase the physical distance between people (e.g., staying at home) to slow the spreading of the virus had a major impact on their daily lives (Tull et al., 2020). Although the participant groups from before and during the COVID-19 outbreak did not differ significantly on important variables, it is conceivable that the COVID-19 measures have influenced the way people conducted and evaluated their daily activities. For instance, the need to maintain physical distance can influence the level of emotional distress experienced by the participants, their choices in undertaking certain activities, as well as their evaluations of these activities (De Haas et al., 2020).

Finally, the study was based on a convenience sample and the characteristics of the individuals who decided not to participate are unknown. It is conceivable that people who experienced high levels of JLCG or depression symptoms were less likely to engage, for instance because they did not want to commit themselves to a 5-day study on their presumably unpleasant feelings regarding their job loss. On the other hand, people who experience high levels of JLCG and depression symptoms could also be more likely to participate, because they are interested in the study topic as a result of their personal experience. Since we did not draw a random sample of people who had

involuntarily lost their job, generalization of our findings must be made with caution (Etikan et al., 2016).

4.2 | Implications and future research

In general, the current results suggest that in terms of their impact on the fulfilment of basic needs and levels of emotional distress, the perceived utility of daily activities is more important than the time invested in these activities. For unemployed individuals this implies that to dampen the adverse effect of their job loss, they must undertake activities which they consider useful. Mental health professionals seeking to alleviate symptoms of JLCG or depression after job loss need to consider carefully which type of activities are suitable for individual clients. Specifically, interventions should particularly focus on increasing engagement in activities that are evaluated positively by the client to obtain the best results. For caseworkers and policy makers these results provide valuable insights. In order to support unemployed people when helping to increase their employability and decrease their level of psychological distress (Janssens et al., 2020), practitioners and policy makers should not only stimulate them to undertake *any* activity to create more structure in the week; instead, they should take an individual's evaluation of each activity into account.

For future research it would be interesting to consider different elements of the evaluation of activities, for example, whether an activity had a positive influence on someone's sense of self-efficacy or if one engaged in activities voluntarily or pressured by environmental factors. This could provide more insight in the type of evaluations of activities that are most strongly related to emotional distress and what type of activities should be included in tailormade early interventions or as part of personalized preventive measures after involuntarily job loss.

In addition, the present results indicate that the relation of the fulfilment of basic needs with daily activities and levels of emotional distress is limited, when it is measured with short time intervals within the moment. This is noteworthy, since this is not in line with prior LDM-based findings in relation to well-being and certain activities (Muller & Waters, 2012; Selenko et al., 2011; Yang & Matz, 2020). For future research, it would be interesting to explore if these small or even absent effects of the fulfilment of basic needs are replicated when these are studied between, instead of within persons. Finally, it is critical to assess whether these results also apply to other groups to verify that, despite the broad acceptance of the LDM, this theory might be less adequate in relation to JLCG and depression following involuntary job loss.

5 | CONCLUSION

The present daily diary study provides more insight in the linkage between daily activities and emotional distress after involuntarily job loss from the perspective of Jahoda's LDM. Although the hypothesized mediation model was not confirmed, the study results do indicate that daily activities can contribute to the fulfilment of basic needs even in the case of job loss, and that the basic needs are negatively related to emotional distress. The current results also indicated that the perceived utility of an activity is of more concern than the amount of time spent on that activity in relation to levels of emotional distress. These insights highlight the significance of tailormade behavioural interventions as well as preventive measures, where the evaluation of an activity by a participant must be decisive rather than general guidelines about which activities are supportive for persons with high levels of JLCG or depression symptoms after involuntary job loss.

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CONFLICT OF INTEREST

All authors declare that they have no conflict of interest.

DATA AVAILABILITY STATEMENT

The data set is freely retrievable [Van Eersel et al., 2022b].

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