

The Role of Psychological Detachment and Negative Experiences in the Relationship between On-Call Work, Fatigue, and Recovery

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Management Summary

Inducement

The present research paper examines the relationship between on-call work and wellbeing. On-call work refers to work scheduling on a 'needs basis' that helps to provide full work time coverage, especially in professions that urgently require an employee's expertise at certain moments. During an on-call duty, an employee has to be available for a possible call, but only needs to work when called. A typical profession that relies on on-call duties is the midwife, that has to deal with imminent birth or urgent pregnancy advice when called.

Previous occupational health research has shown that on-call work can have detrimental effects on employees' health and well-being (e.g., Nicol & Botterill, 2004). However, the major part of previous research focused on 'on-site' on-call duties among physicians, during which the physician remains at the place of employment. On the other hand, 'off-site' on-call duties, where employees are supposed to be outside of their regular work environment while waiting for call, gained not as much scientific attention until recently. Lately, a small number of studies specifically addressed these 'off-site' on-call duties and concluded negative relationships between the exposure to off-site on-call work and several indicators of wellbeing (e.g., Bamberg, Dettmers, Funk, Krähe, & Vahle-Hinz, 2012; van de Ven et al., 2015). Other than that, the experience of the period during which an individual is on-call, might play a crucial role, as suggested by recent research (Ziebertz et al., 2015).

Due to the lack of research, the present study aims to provide answers to the questions to what extent the mere exposure to on-call duty hours is related to fatigue and need for recovery in midwives (1), in how far fatigue and need for recovery are related to a negative experience of being on-call (2a) and psychological detachment (2b), and whether a negative

experience of being on-call (3a) and psychological detachment (3b) act as moderators on the relationship between exposure to on-call duty hours and the dependent variables.

Method

151 female Dutch midwives participated in a cross-sectional survey study by completing an online questionnaire. Data was analyzed with several multiple hierarchical regression analyses.

Results

Results revealed no significant relationship between exposure to on-call duty hours and fatigue and need for recovery (1). However, the negative experience of being on-call (2a) and psychological detachment (2b) both significantly predicted variation in fatigue and need for recovery. Neither negative experience (3a) nor psychological detachment (3b) moderated the relationship between exposure and the dependent variables.

Conclusion & Implications

The present study suggests that the experience of being on-call, rather than the mere exposure to on-call work, is related to higher levels of fatigue and need for recovery. Based upon the current findings, modern employers who make use of on-call duty schedules are advised to take the individual experiences of such duties into account. Moreover, the results can be a matter of interest for (future) midwives who are uncertain about whether or not they are suited for that kind of work.

Abstract

This article investigated the role of psychological detachment and the negative experience of being on-call in the relationship between on-call work, fatigue, and recovery. 151 female Dutch midwives participated in a cross-sectional survey study that assessed exposure to on-call duty hours and its relation to fatigue and need for recovery. Moreover, the survey examined in how far the negative experience of being on-call as well as psychological detachment related to the dependent variables. Results of several multiple hierarchical regression analyses revealed no significant relationship of exposure to on-call duty hours with fatigue and need recovery. A negative experience and psychological detachment both significantly predicted variation in fatigue and need for recovery (all $ps < .05$), but did not moderate the relationship between exposure and the dependent variables. Results indicate that the experience of being on-call, rather than the mere exposure to on-call work, impairs wellbeing. The study suggests that future research with more elaborate designs is needed in order to draw valid conclusions about on-call work and wellbeing.

‘On-call work’ is a widely used term to describe a certain type of flexible work schedules in which the working person has to be available during a scheduled period, but only has to work when called by his employer or his client. This scheduling on a ‘needs basis’ helps to provide the work time coverage that is necessary for the varying demands of our 24/7 society and economy, especially in professions that urgently require an employee’s expertise at certain moments (Nicol & Botterill, 2004). Various kinds of facilities therefore rely on on-call work: this ensures the personnel’s availability on the short run, especially when the total amount of work to be done does not require full shift coverage. Typical on-call work professions include doctors, firemen, pilots, engineers, or midwives.

Two different types of on-call work can be distinguished: ‘*On-site*’ on-call work refers to on-call duties during which the employee remains at the place of employment. This is often the case with physicians in hospitals or in the industrial sector, where technicians and engineers are required on site for urgent maintenance work. During ‘*off-site*’ on-call duties on the other hand, employees are supposed to be outside of their regular work environment but in vicinity – for example at home – while being available for a possible call in (Carley, 2007). The ‘inactive’ period of being off-site on-call does not count as working time in the Netherlands (Dutch Ministry of Social Affairs and Employment, 2010).

Previous occupational health research has shown that on-call work in general can have several detrimental effects on different aspects of employees’ health and well-being. For example, Nicol and Botterill (2004) conducted a review including sixteen studies on the (mental) health effects of on-call work up to the year 2000. The review indicated a connection between the exposure to on-call work and increased stress, decreased mental-wellbeing, and poor sleep quality. However, a major part of previous research has only focused on the medical sector, where the on-call duties were frequently on-site at the hospital. With the

increase of off-site on-call duties, especially beyond the medical sector, research on possible detrimental effects of this type of work is a current matter of scientific interest.

Lately, a small number of studies on on-call work specifically addressed off-site on-call duties. For example, a diary survey was conducted to investigate the effects of off-site on-call work on IT service workers (Bamberg, Dettmers, Funck, Krähe, & Vahle-Hinz, 2012). The results revealed a positive relationship of on-call duties with irritation and negative mood and a negative relationship with social, housework, and low-effort activities. Furthermore, a recent questionnaire study indicated that exposure to an off-site on-call duty was related to an increased need for recovery in technical distal on-call workers (van de Ven et al., 2015).

The way in which the exposure to on-call duties may affect health and well-being may be due to a lack of sufficient recovery. For example, recovery may be impaired as a result of the added demands and constraints due to the mere obligation to be available within a set period, which forces employees to stay in vicinity for an on-call duty and can restrict them from recovering leisure activities to properly recover from work. According to the effort-recovery model (Meijman & Mulder, 1998) and the allostatic load theory (McEwen, 1998), a long-lasting situation of incomplete recovery will eventually result in chronic load reactions that lead to health problems on the long term.

Based on the effort-recovery model (Meijman & Mulder, 1998), it is assumed here that the added demands and restrictions that come along with the mere exposure to on-call duty hours (i.e., being available and in vicinity) will likely interfere with recovery. Consequently, my first hypothesis is that (1) the amount of exposure to on-call duty hours will be positively related to fatigue as well as need for recovery.

Besides the mere exposure to on-call duties, the subjective experience of an on-call duty might play a crucial role regarding the detrimental effects of on-call work. One of the already mentioned studies on the exposure to on-call duties furthermore revealed that the

influences of on-call work on well-being were independent from being actually called in for work (Bamberg et al., 2012). The finding suggests that the state of being on-call, rather than the mere amount of working hours, might be experienced in a negative and unfavorable way by itself, which may be connected to the found effects. Similar results were also obtained in a study that even distinguished between “on-call, but not called” and “on-call, but called” (van de Ven et al., 2015).

Previous research suggests that an unfavorable experience of work and work conditions can have a significant impact on possible negative effects due to work (e.g., Beckers et al., 2008; van Hooff, Geurts, Beckers, & Kompier, 2011). Accordingly, on-call duties are likely to be experienced as stressful because of the high amount of unpredictability or uncertainty and the resulting lack of control over whether or not an employee will be called to work. Research has already shown that unpredictability can in fact lead to stress (McGrath, 1976). Very recent research on off-site on-call work has found that a negative experience of on-call duties is positively related to fatigue, work-home interference, and perceived performance difficulties, whereas the mere exposure to those duties showed significant relation at all (Ziebertz et al., 2015). Other than a solely negative experience of or during an on-call period, ‘psychological detachment’ might be related to well-being as well, but the other way around. Psychological detachment describes the ability to mentally disengage from work-related issues (Sonnentag & Bayer, 2005). Therefore, individuals that can psychologically detach from on-call work and from the therein implied uncertainty are assumed to have a less distressing experience of that period.

Similar to the way in which the mere exposure to on-call duty hours with its added constraints might interfere with recovery, a negative experience of on-call work is expected to impede recovery as well. That is because the negative experience of the unpredictability may consequently interfere with an individual’s ability recover from work, which may ultimately

lead to stress and impaired well-being, according to the effort-recovery model (Meijman & Mulder, 1998). A lack of psychological detachment has been shown to predict negative recovery-related outcomes (Sonnentag, 2011), thus the ability to psychologically detach may in turn promote recovery.

That is why my second hypothesis (2) states that (a) a negative experience of being on-call will be positively related to fatigue and need for recovery, whereas (b) psychological detachment will be negatively related to those outcome variables.

Besides, a negative experience of being on-call and psychological detachment might both be potential moderators on the detrimental outcomes of the exposure to on-call duties, that are expected with the first hypothesis. A negative experience of being on-call might thus worsen the relationship between the exposure to on-call duty hours. For example, the added obligations and restrictions through exposure to on-call duties may have an even worse relationship with wellbeing, if that specific time period is unfavorably experienced. In contrast, psychological detachment might act as a buffer in this relationship: People with the tendency to psychologically detach are assumed to be able to relax and recover during that on-call period, because they feel less restricted and obligated by the exposure to on-call work, or not even restricted at all.

Because of that, the third hypothesis (3) is that (a) a negative experience of being on-call and (b) psychological detachment will moderate the relationship of the exposure to on-call duty hours with fatigue and need for recovery. In doing so, the negative experience is assumed to worsen the expected negative outcomes, while psychological detachment is expected to act as a buffer against these negative outcomes.

In sum, the mentioned literature on on-call work suggests that being on-call can have detrimental influences on employee's health and well-being. However, research on off-site on-call duties is practically relevant because the hours during an on-call duty's inactive period

– that is the period during which the on-call worker has to be available without being called yet – are not classified to be working hours by Dutch legislation (Dutch Ministry of Social Affairs and Employment, 2010). If not counted as working hours, common sense would therefore declare these inactive on-call duty hours as ‘free’ or recreational time. This may eventually be problematic because proper free hours are supposed to provide recovery from work stress, whereas off-site on-call duties are assumed to impair recovery, without the employer being legally obligated to compensate for that. If off-site on-call duties, especially their inactive hours, scientifically turn out to interfere with recovery and ultimately with wellbeing, it would be advised to arrange legitimate compensation for the impairment of recovery.

Dutch Midwives, who are subject to the present study, typically work on schedules that are for the major part comprised of off-site on-call duties – sometimes even for 24 hours per day and sometimes in addition to fixed working hours. During suchlike duties, they are expected to be available in cases of emergency that midwives typically have to deal with, for example imminent delivery or for urgent issues and concerns of their pregnant patients. Health professionals like midwives have earlier been shown to be prone to stress and burnout due to their specific kinds of work demands and schedules that are typical for these professions (e.g., Mollart, Skinner, Newing, & Foureur, 2007). Nevertheless, there has been done no research that specifically addresses the relationship between midwives’ typical off-site on-call duties and health and well-being so far, which leaves it as matter of high interest for contemporary work-psychological research.

Taken together, the present study aims to provide answers to the questions to what extent the mere exposure to on-call duty hours is related to fatigue and need for recovery in midwives (1), in how far fatigue and need for recovery are related to a negative experience of being on-call (2a) and psychological detachment (2b), and whether a negative experience of

being on-call (3a) and psychological detachment (3b) act as moderators on the relationship between exposure to on-call duty hours and the dependent variables.

Method

Procedure and Participants

Data were collected by means of an online survey, that was created and distributed with the survey tool Qualtrics[®]. Contact information of midwives and midwifery practices in the Netherlands were gathered via the Dutch online health care business register Zorgkaart Nederland[®]. Practices were then recruited and informed via phone call and email. Aim of the phone call was to introduce the research project to a practice and to ask if there was interest in participating in an online survey about work and well-being of midwives, which would take about 25 minutes to complete. After a positive reaction, an email to the practice or midwife was sent which provided an open link to get access to the questionnaire. Those practices and midwives that were not or inconveniently contactable via phone call received an invitation via email with elaborate information about the research project. All participants were encouraged to share the email or link to other midwives. Participation was in turn optionally rewarded with the chance of winning one out of three gift vouchers worth 15, 25, and €50.

In total, 170 midwives filled in the questionnaire. Response rates could not be calculated in the present study due to the fact that whole midwifery practices with varying numbers of employed midwives were addressed, rather than individual midwives. Respondents with missing data on critical variables ($n = 14$) as well as one respondent that indicated an impossible number of on-call hours (more hours than one week has) were excluded from the analyses. Moreover, four male respondents were not incorporated in the analyses because the male subsample would have been far too small to make valid statements about gender differences. Other than that, a totally female sample reflected the Dutch midwifery branch more consistently, since 98.4% of all Dutch midwives are in fact female

(Dutch Institute for Research on Health Care, 2011). Ultimately, the final sample consisted of 151 female Dutch midwives ($M_{\text{age}} = 37.85$, $SD_{\text{age}} = 10.58$, age range: 22–63 years)

Measures

This study was conducted as collaboration between two researchers. Only the items relevant for my current research are presented below.

On-Call Duty Exposure. Participants were asked to report the *total amount of hours per week* in which they were exposed to on-call work. In addition, they were also asked to indicate only the number of *active on-call hours per week* (i.e., the number of hours of an on-call duty in which midwives actually had to work after a call).

Negative Experience of Being On-Call. Due to a lack of validated measurements for the *negative experience of being on-call*, a total amount of eight self-constructed items assessed several indicators of the experiences of being on-call (See Appendix). The response scales for all of these eight items ranged from 1 to 10 which is based on the well-known Dutch grading system. An example item is: “In how far do you feel restricted (e.g., in choosing leisure time activities) during an on-call duty?” (1 = not at all restricted, 10 = extremely restricted). Cronbach’s alpha among the eight items was .82.

Psychological Detachment. To assess *psychological detachment* during the inactive period of an on-call duty, a shortened version (two items) of the psychological detachment subscale of the Recovery Experience Scale (REQ; Sonnentag & Fritz, 2007) was used. The original questionnaire refers to after work hours. For use in the present study, the scale was adapted to fit the time period of an on-call duty in which a midwife is inactive, instead of after work hours. An example item is “During the inactive period of an on-call duty, I don’t think about work at all”. Respondents had to indicate their answer on a five-point Likert scale ranging from 1 (totally disagree) to 5 (totally agree). Cronbach’s alpha among the two items used was .78.

Fatigue. I assessed *fatigue* with a shortened version (four items) of the Fatigue Assessment Scale (FAS; de Vries, Michielsen, van Heck, & Drent, 2004). An example item is: “I suffer from fatigue.” The response to each item was scored on a five-point Likert scale (1 = almost never; 2 = sometimes; 3 = regularly; 4 = often; 5 = almost always). The mean score of the four items served as dependent measure. Cronbach’s alpha among these items was .81.

Need for Recovery. *Need for recovery* was assessed with a shortened version (six items) of the Need for Recovery Scale (NRS; van Veldhoven, & Broersen, 2003). An example item is “I find it difficult to relax at the end of a working day.” Answers were provided on a four-point Likert scale (1 = almost never; 2 = sometimes; 3 = often; 5 = almost always). Mean scores were obtained to be entered in the analyses. Cronbach’s alpha among the six items was .75.

Control Variables. In addition to the specified variables, two control variables were included in the analysis in order to avoid potential confounding. I controlled for respondents’ *work experience as midwife* (years), as midwives may differ in their reaction to on-call duties, for example by getting used to it over the years. Besides, I controlled for the presence of *children in the household* (0 = no, 1 = yes), since the presence of children to take care of can turn out to be an added kind of demand during an on-call duty.

Analysis

In order to test the Hypotheses 1, 2a, and 3a, two four-step hierarchical regression analyses were conducted (i.e., one for the mean scores of each of the dependent variables: fatigue and need for recovery). In step one of each analysis, the two control variables (i.e., years of work experience and children in the household) were entered. The on-call exposure variables (i.e., total number of on-call duty hours per week and number of active on-call duty hours per week) were entered as predictors in step two of each analysis, in order to test

Hypothesis 1. Hypothesis 2a was tested by entering the mean score of the negative experience of being on-call as predictor in step three. In order to test a moderation effect of a negative experience of being on-call on the relationship between the exposure to on-call duty hours with the dependent variables (3a), the interactions between negative experience of being on-call and the total as well as the active on-call duty hours were entered in step four of both analyses.

To be able to test the Hypotheses 2b and 3b, two four-step hierarchical regression analyses (i.e., one for fatigue and one for need for recovery) were separately conducted from the previously mentioned analyses. Step one and two were identical to the abovementioned analyses, whereas psychological detachment was entered as predictor in step three instead of the negative experience of being on-call. Moreover, the interactions between psychological detachment and the total as well as the active on-call duty hours were entered as predictors in step four.

The decision to conduct separate analyses for a negative experience of being on-call (a) and psychological detachment (b) was due to the fact that both variable were assumed to have a somewhat overlapping theoretical construct, and therefore should not be included in the same analysis. The significant correlation ($r = -.38$, see Table 1) between psychological detachment and a negative experience of being on-call supported this assumption.

In each of the four multiple regression analyses, the predictors were mean-centered before calculating the interaction scores, and the predictors' centered scores were entered in the analyses.

Results

Descriptive Statistics and Correlations

Descriptive Statistics. Table 1 shows the descriptive statistics of the main variables used in the current research. As can be seen, the average midwife was on-call for 51 hours per

week ($SD = 20.78$), with a range from 1 to 150 hours. The average amount of *active* on-call hours was 22.35 ($SD = 10.52$), ranging from 0 to 70. Furthermore, the negative experience of being on-call was mediocre ($M = 4.94$, $SD = 1.36$). It can also be seen that, at an average, respondents tend to psychologically detach below midpoint ($M = 2.08$, $SD = 0.76$).

Table 1
Descriptive Statistics of the Main Variables (N = 151)

	Range	Min	Max	<i>M</i>	<i>SD</i>
On-call duty exposure					
Amount of total hours on-call per week		1.00	150.00	51.00	20.78
Amount of active on-call hours per week		0.00	70.00	22.35	10.52
Negative experience of being on-call	1–10	2.13	9.38	4.94	1.36
Psychological detachment	1–5	1.00	4.50	2.08	0.76
Fatigue	1–5	1.50	4.00	2.53	0.46
Need for recovery	1–5	1.00	3.00	1.77	0.42
Control variables					
Children at home ^a	0–1	0.00	1.00	0.56	0.50
Years of work experience		3.00	42.00	16.58	9.32

^a0 = no children present, 1 = children present.

Table 2
Correlations among Main Variables (N = 151)

	1	2	3	4	5	6	7
1. Total OC hours							
2. Active OC hours	.45**						
3. NEX	-.26**	-.03					
4. PD	.15	.06	-.38**				
5. Fatigue	-.13	.07	.30**	-.22**			
6. Need for recovery	-.16	-.01	.53**	-.31**	.48**		
7. Children at home ^a	-.23**	-.06	.02	.01	.00	.07	
8. Work experience	-.11	-.23**	-.02	.18*	-.11	-.04	.19*

Note. OC = on-call; NEX = negative experience of being on-call; PD = psychological detachment

* $p < .05$. ** $p < .01$.

Correlations. The correlations among the main variables are depicted in Table 2. Interestingly, the number of total on-call duty hours per week has a significant negative correlation with a negative experience of being on-call. Other than that, the on-call work exposure measures did not appear to significantly correlate with the two dependent variables fatigue and need for recovery. A negative experience of being on-call showed significant positive correlations with both fatigue and need for recovery. Additionally, psychological detachment negatively correlated with the two dependent variables. Psychological detachment also showed a high negative correlation with a negative experience of being on-call and a positive correlation with years of work experience.

Table 3

Hierarchical Regression Predicting Fatigue from Exposure to and Experience of Being On-Call

Variable	Model 1			Model 2			Model 3			Model 4		
	<i>B</i>	<i>SE B</i>	β	<i>B</i>	<i>SE B</i>	β	<i>B</i>	<i>SE B</i>	β	<i>B</i>	<i>SE B</i>	β
Children	.02	.08	.02	-.02	.08	.02	-.01	.08	-.01	-.03	.08	-.03
Work Experience	-.01	.00	-.11	-.01	.00	-.09	-.00	.00	-.09	-.01	.00	-.11
Total OC-Hours				-.01	.00	-.21*	-.00	.00	-.12	-.00	.00	-.13
Active OC-Hours				.01	.00	.15	.01	.00	.12	.01	.00	.10
NEX							.09	.03	.27**	.08	.03	.25**
Total X NEX										.00	.00	-.02
Active X NEX										-.00	.00	-.12
<i>R</i> ²	.012			.048			.114			.129		
ΔR^2	.012			.035			.066			.016		
<i>F</i> for change in <i>R</i> ²	0.922			2.707			10.792**			1.283		

Note. OC = on-call; NEX = negative experience of being on-call.

* $p < .05$. ** $p < .01$.

Exposure to On-Call Work in relation to Fatigue and Need for Recovery

According to the results, the total number of on-call duty hours per week and the number of active on-call duty hours per week could neither explain a significant proportion of variance

in fatigue ($\Delta R^2 = .04$, $F(2, 146) = 2.71$, and $p = .07$), nor in need for recovery ($\Delta R^2 = .03$, $F(2, 146) = 1.88$, and $p = .16$) over and above the control variables. Therefore, there appeared to be no support for Hypothesis 1.

Table 4

Hierarchical Regression Predicting Need for Recovery from Exposure to and Experience of Being On-Call

Variable	Model 1			Model 2			Model 3			Model 4		
	<i>B</i>	<i>SE B</i>	β	<i>B</i>	<i>SE B</i>	β	<i>B</i>	<i>SE B</i>	β	<i>B</i>	<i>SE B</i>	β
Children	.07	.07	.08	.04	.07	.04	.05	.06	.06	.04	.06	.05
Work Experience	-.00	.00	-.05	-.00	.00	-.05	-.00	.00	-.04	-.00	.00	-.06
Total OC-Hours				-.00	.00	-.18	.00	.00	-.02	-.00	.00	-.03
Active OC-Hours				.00	.00	.06	.00	.00	.00	.00	.00	-.00
NEX							.16	.02	.52***	.16	.02	.50***
Total X NEX										.00	.00	-.04
Active X NEX										-.00	.00	-.08
R^2	.008			.033			.283			.294		
ΔR^2	.008			.025			.250			.011		
F for change in R^2	0.567			1.881			50.656***			1.080		

Note. OC = on-call; NEX = negative experience of being on-call.

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

Experience of Being On-Call in Relation to Fatigue and Need for Recovery

As can be seen in Table 3, the negative experience of being on-call (Model 3) could explain an additional 6.6% of the variation in fatigue, which was a significant change in R^2 ($F(1, 145) = 10.79$, $p < .01$). The negative experience also explained 25% of the variance in need for recovery over and above the previous two models (see Table 4). This change in R^2 was significant ($F(1, 145) = 50.66$, $p < .001$). Thus, Hypothesis 2a was supported for both fatigue and need for recovery.

Psychological detachment explained additional 3.6% of the variation in fatigue and this change in R^2 was significant ($F(1, 145) = 5.68$, $p < .05$) (see Table 5). As for the variation in need for recovery, psychological detachment could also explain additional 7.9% over and

above the two models entered beforehand (see Table 6). This was a significant change in R^2 ($F(1, 145) = 12.96, p < .001$).

Table 5

Hierarchical Regression Predicting Fatigue from Exposure to On-Call Work and Psychological Detachment

Variable	Model 1			Model 2			Model 3			Model 4		
	<i>B</i>	<i>SE B</i>	β	<i>B</i>	<i>SE B</i>	β	<i>B</i>	<i>SE B</i>	β	<i>B</i>	<i>SE B</i>	β
Children	.02	.08	.02	-.02	.08	-.02	-.02	.08	-.02	-.02	.08	-.02
Work Experience	-.01	.00	-.11	-.01	.01	-.09	-.00	.00	-.05	-.00	.00	-.07
Total OC-Hours				-.01	.00	-.21*	-.00	.00	-.18	-.00	.00	-.20
Active OC-Hours				.01	.00	.15	.01	.00	.15	.01	.00	.16
PD							-.12	.05	-.20*	-.13	.05	-.21*
Total X PD										.00	.00	.08
Active X PD										-.01	.00	-.02
R^2	.012			.048			.084			.088		
ΔR^2	.012			.035			.036			.004		
<i>F</i> for change in R^2	0.922			2.707			5.681*			0.340		

Note. OC = on-call; PD = psychological detachment.

* $p < .05$. ** $p < .01$.

Moderation by Negative Experience and Psychological Detachment

With regard to a potential moderation effect of a negative experience of being on-call on the relationship that was examined in Hypothesis 1, the interaction between negative experience and total as well as active number of on-call hours per week (see Table 3, Model 4) did not explain a significant proportion of variance in fatigue ($\Delta R^2 = .02, F(2, 143) = 1.28$, and $p = .28$). As for need for recovery (see Table 4), these interactions also did not explain a significant proportion of its variance ($\Delta R^2 = .01, F(2, 143) = 1.08$, and $p = .34$). For that reason, Hypothesis 3a was not supported.

As it is shown in Table 5, the interaction between psychological detachment and the total as well as active number of on-call hours per week (Model 4) was not significantly

related to the variation in fatigue ($\Delta R^2 < .01$, $F(2, 143) = 0.34$, and $p = .71$). Neither could these interactions explain a significant proportion of variance in need for recovery (see Table 6), as the change in R^2 was not significant ($\Delta R^2 = .01$, $F(2, 143) = 0.70$, and $p = .49$). As such, Hypothesis (3b) was also not supported.

Table 6

Hierarchical Regression Predicting Need for Recovery from Exposure to On-Call Work and Psychological Detachment

Variable	Model 1			Model 2			Model 3			Model 4		
	<i>B</i>	<i>SE B</i>	β	<i>B</i>	<i>SE B</i>	β	<i>B</i>	<i>SE B</i>	β	<i>B</i>	<i>SE B</i>	β
Children	.07	.07	.08	.04	.07	.04	.04	.07	.04	.03	.07	.04
Work Experience	-.00	.00	-.05	-.00	.00	-.05	.00	.00	.01	.00	.00	-.01
Total OC-Hours				-.00	.00	-.18	-.00	.00	-.13	-.00	.00	-.17
Active OC-Hours				.00	.00	.06	.00	.00	.07	.00	.00	.08
PD							-.16	.05	-.29***	-.17	.05	-.31***
Total X PD										.00	.00	.10
Active X PD										-.00	.00	-.05
R^2	.008			.033			.112			.121		
ΔR^2	.008			.025			.079			.009		
F for change in R^2	0.567			1.881			12.960***			0.708		

Note. OC = on-call; PD = psychological detachment.

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

Discussion

The underlying question in this study was, whether the exposure to midwives' off-site on-call duties (1) and their experience of being on-call, that is a negative experience (2a) and psychological detachment (2b), were systematically related to fatigue and need for recovery. Additionally, I investigated whether the relationship between the exposure to on-call work and fatigue and need for recovery was moderated by the negative experience of being on-call (3a) and psychological detachment (3b).

Contrary to my expectations, the present results indicate no significant relation between exposure to on-call duty hours and fatigue or need for recovery (1). Hence, merely being exposed to hours of on-call duties has not been shown to be systematically related to increased levels of fatigue or the need for recovery. These results contradict the major trend of earlier research conducted on on-call work and wellbeing in general (e.g., Nicol & Botterill, 2004). They are also not in line with research that specifically addressed off-site on-call work and its relation to need for recovery (van de Ven et al., 2015). However, this inconsistency may be due to the nature of the different samples used in these studies. For example, the literature review on on-call work (Nicol & Botterill, 2004) majorly incorporated studies on physicians whose on-call duties typically happen overnight. Night shifts by themselves have earlier been found to be negatively connected to employees' health and wellbeing, potentially due to sleep deprivation (Kantermann, Juda, Vetter, & Roenneberg, 2010). In contrast, midwives' varying on-call duties take place during daytime for a larger part. Aside from that, the used exposure measures in the present research may contribute to the conflicting results: Asking for midwives' self-reported on-call duty hours per week leaves room for a certain amount of potential errors or bias. For example, a midwife might not have had an accurate overview of her factual on-call duty hours and therefore just guessed an amount that seemed appropriate to her.

The hypotheses about the negative experience of being on-call and psychological detachment were confirmed. As hypothesized, a higher negative experience of being on-call was related to higher levels of fatigue and need for recovery (2a). Also as expected, psychological detachment was negatively related to both fatigue and need for recovery (2b). These results are in line with previous research that included the role of a negative work experience (e.g., van Hooff et al., 2011) and are theoretically supported by the aforementioned effort-recovery model (Meijman & Mulder, 1998). According to the effort-

recovery model, it can be concluded that a negative experience of being on-call probably interferes with recovery, which is in turn associated with increases in fatigue and need for recovery. On the other hand, a higher tendency to psychologically detach from work-related issues seems to promote recovery, which could theoretically explain the lower levels of fatigue and need for recovery that were associated with psychological detachment.

It was also hypothesized in the present research, that the negative experience of being on-call (3a) and psychological detachment (3b) would act as moderators in the relationship between the exposure to on-call duty hours and fatigue as well as need for recovery. Both hypotheses were not confirmed. Because there was no significant relationship of the exposure to on-call work with fatigue and need for recovery by itself, moderation effects of a negative experience of being on-call and psychological detachment on this relationship could not be established. Therefore, it cannot be concluded that a negative experience of being on-call worsens on-call work's negative outcomes. It also cannot be concluded that psychological detachment acts as a buffer against those negative outcomes, against expectations.

My results are consistent with the general findings of a recent study that also included the relationship of the exposure as well as the experience of on-call work with fatigue (Ziebertz et al., 2015). Therein was similarly suggested that the experience of being on-call, rather than the mere exposure to on-call duty hours, was related to the detrimental outcomes by on-call work. Although the same pattern that has been found in the current study, it should not simply be concluded, that the exposure to on-call duty hours is totally irrelevant for fatigue or recovery: Without any exposure to on-call work, there cannot be any experience of on-call work or detachment from it after all. Either way, a negative experience of being on-call and psychological detachment were shown to play a significant role for fatigue and recovery, whereas the here used measures for exposure to on-call work did not.

Strengths and Limitations

The current research is assumed to be one of the first to examine both exposure to on-call duty hours and the experience of being on-call. Despite very few exceptions (e.g., Ziebertz et al., 2015), the role of the experience of being on-call has generally been ignored in previous research until now. Therefore, the current paper adds valuable insights to contemporary research on on-call work.

Another asset of the present study is its focus on one specific occupation, namely on midwives. As a consequence, I investigated a very coherent and commensurable type of on-call work among the sample of midwives. For that reason, the conclusions drawn are valid for the occupational group of midwives which is typically characterized by on-call work. The current research therefore is a matter of particular interest for a whole professional category.

However, this asset also appears to be a major limitation of the present study. Because of the homogenous sample, it is unlikely to draw valid conclusions about any other professions than midwives. Thus, generalizability of the found results turns out to be very low. To be able to make externally valid inferences, future research needs to incorporate heterogeneous samples of different professional groups and from different branches and organizations.

Second, the items to assess the exposure to on-call work are not without problems. Possibly, these self-constructed items were not clear to some of the respondents and were prone to mistakes. To get accurate measures of the exposure to on-call work hours, further research is advised to make use of systematically registered data that is administrated by the employer or by a company. This would certainly reduce errors due to self-report.

Finally, the present research was cross-sectional. For this reason, no conclusions about causal relations between the variables can be drawn. Since effects might be bidirectional (i.e., fatigue and need for recovery may affect the experience of being on-call, instead of the other

way around), future research should make use of experimental or diary designs to determine the causal direction of effects.

Practical Implications

Because the inactive hours during which a general on-call worker can be called are widely and even by law considered as equivalent to free or rest time (Dutch Ministry of Social Affairs and Employment, 2010), employers are not legally obligated to compensate for these hours. Nevertheless, the present study suggests that this inactive period during an on-call duty might be negatively experienced and – in line with the effort-recovery model (Meijman & Mulder, 1998) – therefore be related to higher levels of fatigue and need for recovery. Modern employers who rely on off-site on-call work are advised to take their employees' experience into account to prevent them from possible long-term health problems, for example by granting extra compensation for on-call duty hours or by implementing sufficient leisure time with the purpose of recovery from work.

In addition to off-site on-call work in general, the present study also gives implications for midwives or those who intend to become a midwife. Since a negative experience of being on-call can be assumed to be associated with lower wellbeing, it might be a matter of interest for (future) midwives whether they are suited for that kind of work, or not. For example, an individual with a low ability to psychologically detach from work might experience more strain due to the uncertainty that comes with on-call work.

Ultimately, the present research should serve as an approach to guide future studies in the field of on-call work in the right direction, by emphasizing the role of the individual experience specifically addressing modern off-site on-call duties. Insights in this field can then be used to determine whether an individual is able to meet the growing demands of flexible work schedules, such as on-call duties.

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Appendix

Negative Experience of Being On-Call Items

1. In how far do you feel restricted (e.g., in choosing leisure time activities) during an on-call duty? (1 = not at all restricted, 10 = extremely restricted).
2. In how far do you fear to miss a call during an on-call duty (e.g., by not hearing the phone)? (1 = no fear at all, 10 = extreme fear).
3. How stressful do you find not having control over whether or not you will be called during an on-call duty? (1 = not at all stressful, 10 = extremely stressful).
4. How well can you relax during periods in which you do not have to work during on-call duties? (1 = not at all, 10 = extremely well). *Reversed item.*
5. How tiresome do you find an on-call duty? (1 = not at all tiresome, 10 = extremely tiresome).
6. How unpleasant do you find an on-call duty? (1 = not at all unpleasant, 10 = extremely unpleasant).
7. How exhausting do you find an on-call duty? (1 = not at all exhausting, 10 = extremely exhausting).
8. How pleasant do you find an on-call duty? (1 = not at all pleasant, 10 = extremely pleasant). *Reversed item.*