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ORIGINAL ARTICLE

Dynamics of Insight, Emotion Regulation, and Emotional Clarity in Obsessive–Compulsive Disorder

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Abstract

Background The level of insight finds increasing consideration in the diagnostic of obsessive–compulsive disorder (OCD). Past studies illustrated that low levels of insight are associated with higher symptom severity, worse treatment outcome, and emotion regulation (ER) deficits. However, these results are based on retrospective questionnaires categorizing insight as a trait construct, although the temporal variability of insight has long been established. Therefore, studies using repeated measures designs, i.e., ecological momentary assessment (EMA), are needed.

Method Within this EMA study, $N = 71$ individuals with OCD reported on their symptoms, affect, emotional clarity, ER strategies, perceived ER effectiveness, and insight into symptoms up to six times a day over six days.

Results Substantial temporal variations of insight during the assessment period strengthen former evidence that individuals vary in their level of insight over time. Further, higher levels of insight were partly associated with higher perceived ER effectiveness and emotional clarity. Significant associations between symptom occurrence and less insight were consistently found at the momentary level.

Conclusions Results show that it might be worthwhile to address insight as a variable state as well as associated constructs (ER, emotional clarity) in the treatment of OCD more explicitly. Replication and extension of our work is needed.

Keywords Ecological momentary assessment · Emotional clarity · Emotion regulation · Insight · OCD

Introduction

As per its definition in the Diagnostic and Statistical Manual of Mental Disorders (DSM-5), obsessive–compulsive disorder (OCD) is characterized by recurrent and intrusive thoughts or urges as well as co-occurring compulsions to regulate distress associated with these thoughts. Further, level of insight (good to absent) has been added as a specifier to supplement diagnostic evaluation (American Psychiatric Association, 2013). Importantly, in previous versions of the DSM (i.e., before DSM-III-R), sufficient insight was a precondition for OCD diagnosis to ensure distinction from other disorders, such as psychosis. However, poor insight has been found to be common in OCD, with 13–36% of diagnosed individuals reporting it in the course of the disorder (De Berardis et al., 2008; Matsunaga et al., 2002; Raffin et al., 2009). Because poor insight is linked to OCD symptom severity and treatment outcome, it seems worthwhile to further understand the underlying factors that affect insight in the moment to address them in therapeutic processes (Catapano et al., 2001, 2010; Foa et al., 1999; Gan et al., 2022; Ottoni et al., 2023).

Insight, as described in the DSM-5 criteria, refers to the ability of patients to identify whether their OCD beliefs are true or not, or to evaluate the rationality of their compulsions (American Psychiatric Association, 2013; Leckman et al., 2010). Importantly, insight is not unique to

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obsessive–compulsive disorder. Varying degrees of insight are common in several psychopathologies, such as psychotic, affective or anxiety disorders (David, 2020; Ghaemi et al., 2000). Further, insight is generally associated with the ability to attribute symptoms to the underlying mental disorder (e.g., David, 2020; Ghaemi et al., 2000). Likewise, for OCD, this implies the ability to ascribe core beliefs of underlying obsessions and compulsions to OCD as a mental disorder (Brakoulias & Starcevic, 2011).

Previous research has shown that lower levels of insight are associated with higher severity and worse prognosis of OCD (see Huang et al., 2023, for a review). In more detail, poor level of insight, mostly assessed via the Yale-Brown Obsessive–Compulsive Scale (Y-BOCS; Goodman et al., 1989) or the Brown Assessment of Beliefs Scale (BABS; Eisen et al., 1998), has been found to be cross-sectionally associated with greater severity of OC symptoms (e.g., Catapano et al., 2010; De Avila et al., 2019; Jacob et al., 2014; Ottoni et al., 2023; Wolf et al., 2023). Regarding longitudinal treatment outcomes, individuals with poorer insight experienced less symptom reduction two or three years later (Catapano et al., 2010; Visser et al., 2017) Similarly, in a study with 20 diagnosed individuals undergoing a three-week Exposure and Response Prevention (ERP) treatment, individuals with poorer insight showed less reduction in Y-BOCS total scores (Foa et al., 1999). However, these results contrast with the findings of studies that found no predictive value of insight, but partly an improvement of insight alongside a reduction of the Y-BOCS score (Eisen et al., 2001; Selles et al., 2020; Wolf et al., 2023).

These inconclusive results may be explainable by the use of different, solely retrospective questionnaires, which fail to recognize the inherently dynamic nature of insight over time. Illustrating this dynamic, in a first ecological momentary assessment (EMA) study, Landmann et al. (2019) showed a critical time-dependent fluctuation of insight in OCD, with more than 50% of variance explained by within-person differences over multiple time points. These results emphasize the assumption that insight should be considered as a state rather than a trait (e.g., Marková et al., 2009). Hence, altogether, insight can be seen as an immersive, time-variable factor contributing to symptom severity and treatment outcome in OCD which should be considered in the treatment of OCD.

There is already growing evidence that cognitive behavioral therapy (CBT) or mindfulness-based cognitive therapy (MBCT) can improve levels of insight, but associated moderating factors are not clear yet (Landmann et al., 2019; Selles et al., 2020). According to the cognitive-behavioral model, emotion dysregulation emerges as a potentially interesting factor to consider: The occurrence of obsessions is postulated to foster the use of compulsions in OCD to reduce intense affect in the short term. In the long-term, however, compulsions prevent individuals from disproving core beliefs that underlie OC symptoms, thereby maintaining the disorder and serving as a dysfunctional emotion regulation strategy (Salkovskis et al., 1995). The core beliefs arising from intrusive thoughts (e.g., "If I did not turn off the stove, the house will burn down and it will be entirely my fault.") are misinterpreted as true and harmful by individuals with OCD (Salkovskis, 1985). The ability to judge whether these beliefs are true or not reflects insight into the disorder (American Psychiatric Association, 2013). Hence, emotion dysregulation and insight in OCD are associated constructs that merit further investigation.

Besides this theoretical framework, there is already extant literature that emphasizes the importance of emotion dysregulation in the maintenance of OCD (e.g., Fergus & Bardeen, 2014; Moritz et al., 2018). In line with this, individuals with OCD have demonstrated to use less putatively adaptive, engagement-oriented, and more putatively maladaptive, avoidance-oriented strategies (e.g., Fergus & Bardeen, 2014; McMahon & Naragon-Gainey, 2019; Moritz et al., 2018). Relatedly, poor trait insight– measured through the respective Y-BOCS item– was found to be associated with dysfunctional ER and lack of adaptive coping (Moritz et al., 2018; Yazici & Yazici, 2019). In line with that, in a prior study, we identified perceived ER effectiveness as the most consistent predictor of affect and OC symptoms. In this context, we could also show that perceived ER effectiveness was significantly lower in OCD individuals than in mentally healthy controls (Bischof et al., 2024, Hohensee et al., 2025). Taken together, dysfunctional ER emerges as an important influential factor associated with lower levels of insight in OCD, however, the impact of perceived ER effectiveness on insight is not clear yet.

In this regard, an important factor favouring functional ER is emotional clarity, defined as the ability to identify and understand one's own emotional experiences (Mennin et al., 2007; Vine & Aldao, 2014; Vine & Marroquín, 2018). Emotional clarity was found to be reduced in OCD and associated with OC symptom severity (Fergus & Bardeen, 2014; Hohensee et al., 2024; Stern et al., 2014). To the best of our knowledge, there is no research on the specific associations between the construct of emotional clarity and insight in OCD. However, there is evidence for a relationship between high levels of alexithymia (i.e., the lack of ability to verbalize emotions) and poor or absent insight in OCD (De Berardis et al., 2005, 2015). Alexithymia can be seen as a related construct to lack of emotional clarity (Palmieri et al., 2009). Accordingly, recognition of one's own negative feelings was also found to be negatively correlated with insight in OCD (Manarte et al., 2021). In sum, emotional clarity

appears to be relevant to insight, however, research on direct associations is missing so far.

Finally, regarding the vicious circle of ER dysfunction and symptom maintenance, it also seems worth considering the relationship between insight and symptom severity. Landmann et al. (2019) were able to show that both current and antecedent OC symptoms were the strongest predictors for current level of insight. In line with this finding, total Y-BOCS score predicted level of insight on a trait level (Cherian et al., 2012). Thus, past research points towards a bidirectional association between insight and symptom severity.

Altogether, there is evidence for a crucial role of insight in OCD regarding symptom development. Reversely, symptom severity and more general ER abilities, i.e., ER effectiveness and emotional clarity, appear to be associated with insight as well. However, to the best of our knowledge, previous work did not investigate relations among insight, ER effectiveness, and emotional clarity for OCD within one study. Further, most past research used retrospective self-report measures (e.g., DERS, Y-BOCS, BABS), thereby neglecting the temporal dynamic and contextual variation of these constructs (Landmann et al., 2019; Lischetzke et al., 2011; Park & Naragon-Gainey, 2019; Thompson & Boden, 2019). Hence, we implemented ecological momentary assessment (EMA) to gauge these temporal fluctuations by repeated measures in everyday life. Relatedly, it is then possible to consider differences between individuals (i.e., between-person level) and within one individual over time (i.e., within-person level). Furthermore, EMA reduces retrospective biases and improves external validity (Trull & Ebner-Priemer, 2020).

Hence, using this assessment method, we test three hypotheses addressing insight in OCD and its associations to dysfunctional emotion regulation and emotional clarity.

(1) We expect insight will vary considerably over time (replication of findings in Landmann et al., 2019).
(2) Higher emotional clarity and subjective ER effectiveness will predict higher levels of insight in OCD (also after controlling for OC symptoms) at between- and within-person level (for both, the current and subsequent time point).
(3) Lower levels of insight will predict higher likelihood for the occurrence of OC symptoms and vice versa, the occurrence of OC symptoms predicts less levels of insight in OCD at between- and within-person level (for both, the current and subsequent time point).

Method

Data collection was conducted between February 2021 and April 2022. Study design, hypotheses and analysis plan were preregistered at osf.io under the registration ID https://doi.org/10.17605/OSF.IO/UC4VF in August 2021. While data collection started before preregistration, analysis of all data was conducted thereafter. This study is part of a larger project approved by the ethics committee of the Department of Psychology and Sport Science at the University of Münster, Germany. Study material, data, and analysis code are available online at osf.io/p7sj2.

Participants

All data underlying this study is part of a larger sample described in detail in Bischof et al. (2024). Recruitment was performed online across Germany. In total, $N=92$ participants with self-reported OCD symptoms provided their written consent and underwent a diagnostic session. To be included, participants had to be between 18 and 65 years old and fluent in German. Further, they had to fulfill the DSM-5 criteria of OCD as current primary diagnosis (American Psychiatric Association, 2013). Participants were excluded if they had a diagnosis of psychotic disorder, bipolar disorder, borderline personality disorder, substance dependence or abuse, both currently or in the last five years. Further exclusion criteria were a change in psychotropic medication in the 8 weeks prior or during the study and current suicidality. The sample comprised $N=72$ participants after additional dropout following the first diagnostic session (e.g., because of deviating description of OCD symptoms in online and telephone screenings and the subsequent DIPS interview). One participant was unable to name a particular fear behind the compulsions and obsessions. Thus, insight could not be assessed, and this participant was excluded from the analysis, so the final sample comprised $N=71$ participants. The average age of the included participants was 28.92 years ($SD=7.81$) and 78.87% were female. Mean Y-BOCS score was $M=22.06$ ($SD=5.45$), mean BABS score was $M=8.51$ ($SD=3.22$). For a more detailed description of the sample, see Table 1.

Power Analysis

The sample size for the overall project (see Bischof et al., 2024) was calculated according to the main research questions following a power analysis using simulations with the R package *simr* (version 1.0.7; Green & MacLeod, 2016). Due to reasons of feasibility, the a priori estimated sample size was $N=70$, resulting in an assumed power of around 80%.

Table 1 Sociodemographic and clinical characteristics

	Participants ($n=71$)
Age [*M* (*SD*)]	28.92 (7.81)
Gender [Female (%)]	$n=56$ (78.87)
Years of education [*M* (*SD*)]	17.57 (3.61)
Nationality (%)	$n=70$ German (98.59) $n=1$ Bulgarian (0.01)
Comorbidity [Yes (%)]	$n=46$ (64.79)
Number of comorbidities [*M* (*SD*)]	2.02 (1.16)
OCD-related disorder (%)	$n=4$ (8.70)
Anxiety disorder (%)	$n=38$ (82.61)
PTSD (%)	$n=6$ (13.04)
Psychosomatic disorder (%)	$n=5$ (10.87)
Depressive disorder (%)	$n=15$ (32.61)
Sexual dysfunction (%)	$n=3$ (6.52)
Eating disorder (%)	$n=2$ (4.35)
Sleeping disorder (%)	$n=2$ (4.35)
ADHD (%)	$n=1$ (2.17)
Current psychotherapy [Yes (%)]	$n=33$ (46.48)
Current medication [Yes (%)]	$n=25$ (35.21)
Y-BOCS [*M* (*SD*)]	22.06 (5.45)
BABS [*M* (*SD*)]	8.51 (3.22)

PTSD Posttraumatic stress disorder; *ADHD* Attention deficit hyperactivity disorder; *Y-BOCS* Yale-Brown Obsessive–Compulsive Scale; *BABS* Brown Assessment of Beliefs Scale

Materials

All study material is described in more detail in Bischof et al. (2024).

Diagnostic Assessment

Diagnostic Interview for Mental Disorders (DIPS; Margraf et al., 2021). We used the structured clinical interview for mental disorders based on DSM-5 criteria for ensuring the OCD diagnosis. Inter-rater reliability based on 20% of randomly selected double ratings for the OCD section conducted by two raters (C.B. and N.H.) in the late stages of their training as cognitive behavioral psychotherapists was excellent with a Cohen's $\kappa=1$.

Yale-Brown Obsessive–Compulsive Scale (Y-BOCS; Goodman et al., 1989; Hand & Büttner-Westphal, 1991). The semi-structured interview comprises 12 items assessing symptom severity of OCD. The intra-class correlation coefficient (ICC) based on 20% of the data was excellent ($ICC=0.99$).

Brown Assessment of Beliefs Scale (BABS;Buhlmann, 2014;Eisen et al., 1998). With this six-item semi-structured interview, insight into disorder-related beliefs can be assessed. The ICC of 0.97 indicates excellent inter-rater reliability.

EMA-Assessment

Momentary Affect We measured momentary affect via eleven items on a five-point Likert scale. The items (i.e., "*active*", "*in a good mood*", "*calm*", "*relaxed*", "*angry*", "*anxious*", "*lonely*", "*sad*", "*ashamed*", "*guilty*", "*disgusted*") were adapted based on the Emotion Sense Application (e.g., Lathia et al., 2017), including additional OCD-related emotions (*guilty* and *disgusted).* "*Disgusted*" was added after the first ten participants gave feedback that this emotion was missing in the EMA assessment.[1] Between person variance is reflected by an ICC of 0.62 for negative affect and 0.42 for positive affect. Supplementary, we also calculated individual ICCs based on the ratio of the between-person variance and the total variance derived from the sum of the between-person variance and the person-specific residual variances using multilevel Gaussian location-scale models due to the heteroscedasticity of the data. Individual ICCs for negative affect ranged between 0.58 to 0.76 and 0.38 to 0.60 for positive affect.

Emotional Clarity On a five-point Likert scale from 1 (*not clearly at all*) to 5 (*very clearly*) adapted from Park and Naragon-Gainey (2019), participants indicated how clearly they could identify their current emotions. The ICC was 0.51 (individual range: 0.32 to 0.96).

Emotion Regulation and Perceived Effectiveness Participants were able to report their regulation attempts by selecting different emotion regulations strategies they used, e.g., distraction or problem solving (based on Daros et al., 2020; Park & Naragon-Gainey, 2019). Next, on a scale from 0 (*much worse*) to 100 (*much better*), they evaluated their perceived effectiveness in emotion regulation (Daniel et al., 2019). The ICC was 0.19 for ER effectiveness (individual range: 0.18–0.25).

OC Symptoms and Insight Participants reported currently experienced OC symptoms at each time point. If symptoms were present, intensity of obsessions and compulsions were assessed separately on a five-point Likert scale from 1 (*mild*) to 5 (*extreme*). For analysis, the average intensity of obsessions and compulsions was calculated for each time point.

[1] Analyses regarding hypothesis 2 and 3 with negative affect as control variable were conducted with and without the first ten participants missing the affect item disgusted, which did not change the significance of our main predictive variables. The results reported herein include these ten participants, one single deviation of a control variable is reported in the respective table in the supplements.

The ICC was 0.37 for averaged momentary OC symptoms (individual range: 0.33–0.54). Last, irrespective of currently reported symptoms, momentary insight in OCD was measured via two items, i.e. "*How convinced are you at this very moment that your feared belief is or will come true*?" (item 1, "conviction about the veracity of beliefs") and "*How convinced are you at this very moment that engaging in compulsions is reasonable to prevent your feared belief from occurring*?" (item 2, "conviction about the reasonableness of behaviors") on a scale from 0 to 100%. These two items first mentioned in a study from Landmann et al. (2019) showed a high pearson correlation coefficient ($r = 0.83$, Landmann et al., 2019) and represent well the definition of insight following DSM-5 (categorizing OCD related beliefs as true or false; American Psychiatric Association, 2013). For multilevel analyses (hypotheses 2 and 3), insight was thus operationalized as the mean of these two items. The feared belief was determined in advance during the BABS interview together with the participant. The ICC for the mean of the two insight items was 0.56 (individual range: 0.33–0.90).

Study Procedure

We collected all pre-assessment data (DIPS, BABS, Y-BOCS) via online video appointments. Next, following detailed instructions on the application and items, the smartphone application for EMA was installed on the participants' mobile phones. Within six days between 9.00 am and 9.00 pm, they completed up to 36 EMA questionnaires with at least one hour in between. Participants could delay the alarm by five or ten minutes or freeze the application as long as they needed. All questions were asked in relation to the current moment when the prompt occurred. Completing participation, participants were paid up to 80 Euro with an additional possible bonus of 20 Euro for a quota of at least 80% of completed questionnaires (based on the rationale described in Schulte et al., 2021).

Data Analysis

Data were analyzed with the software R (R Core Team, 2023). To test our hypotheses, we calculated multilevel regression models because of the hierarchical structure of the EMA data (i.e., measurements, Level 1, are nested within individuals, Level 2). Due to the heteroscedasticity of the data, we chose multilevel Gaussian location scale model implemented in the function "gaulss()" from the R package *mgcv* (version 1.8–33; Wood, 2017) to model the scale parameter of the response as a function of the predictors (here, gender, age, and an interaction term between gender and age). This decreases the risk of exceeding conservative or liberal inference due to heteroscedasticity by individual specific residual variances. Embedded in a (penalized) likelihood framework, standard errors are readily available, and we used them to compute 95% confidence intervals for all quantities of interest.

For hypothesis 1, intercept-only models for both insight items as dependent variables were calculated to separate within-person and between-person variance sources. Next, we computed the 1 minus the ICC to determine the amount of variance explained by the repeated assessments within persons (Level 1). Due to heteroscedasticity, we additionally report individual ICCs based on the ratio of the between-person variance and the total variance. Lastly, we calculated each person's square root of the mean square successive difference (rMSSD) as another measure for temporal variability (see Landmann et al., 2019).

For hypothesis 2, we first calculated between-person intercept-only multilevel models controlling for age, sex and OC symptom intensity with all variables averaged across all time points: Mean level of insight was predicted by mean emotional clarity and mean perceived effectiveness. For within-person analyses, two random intercept and random slope multilevel models were computed in which momentary insight (model 1) or subsequent insight (model 2) were regressed on the momentary, person-mean centered emotional clarity variable, the momentary, person-mean centered perceived ER effectiveness variable, and the persons' mean scores for each of the two variables. The models also included the previous trial's score of insight to account for autocorrelation and current person-mean centered OC symptom intensity as Level 1 covariate. Deviating from our preregistration based on prior findings regarding heightened negative affect and effects on ER in OCD, we additionally added negative affect as control variable. Both models additionally included day of assessment, age, and gender as control variables. On an explorative base, due to limited data points with reported symptoms, we extended the data points eligible for inclusion in the analysis via operationalizing OC symptoms not regarding their intensity, but regarding their occurrence (yes/no) as an alternative covariate to symptom intensity. This way, we were able to increase our data set to 2277 observations compared to only 935 observations with reported symptoms and, respectively, symptom intensity.

For hypothesis 3, comparable to hypothesis 2, we deviated from our preregistration due to less data points than expected and operationalized OC symptom intensity only by the occurrence or absence of OC symptoms (yes/no). At the between-person level, the averaged likelihood to report OC symptoms during the assessment period was predicted from averaged, grand-mean centered level of insight, and, vice versa, the averaged level of insight was predicted from

the averaged likelihood to report OC symptoms while controlling for age and sex as well as z-standardized mean negative affect. We then calculated random intercept multilevel models in which (1) current and subsequent occurrence of OC symptoms were regressed on the level of insight and, vice versa, (2) current and subsequent insight was regressed on the occurrence or absence of OC symptoms. We controlled all models for previous insight and OC symptoms, respectively, as well as current negative person-mean-centered negative affect. Because we were interested in within- and between-person effects, we also included each person's mean score of insight and likelihood of occurrence of OC-symptoms across all EMA assessments. All within-person models additionally included day of assessment, age, and gender as control variables.

Results

Descriptive Analysis

The overall compliance rate was 87.94%, with $M=31.66$ ($SD=4.61$) questionnaires submitted per person. Across all participants, ER effectiveness was reported at $M=9.66$ times ($SD=6.82$, range: 0–35) with a perceived effectiveness of $M=53.60$ ($SD=15.31$), OC symptoms were reported $M=12.89$ ($SD=7.06$, range: 2–34) times per person with a symptom intensity of $M=3.08$ ($SD=1.02$). Overall, this resulted in a total of 2248 observations analyzed for hypothesis 1. For hypothesis 2, $N=67$ individuals were included in the between-person analysis and 345 (current) to 363 (subsequent) observations were included in the within-person analysis after omitting time points without reported current OC symptoms or ER effectiveness. We conducted explorative analyses with all timepoints including reported ER effectiveness and OC symptom occurrence, operationalized by the presence or absence of OC symptoms (0/1), which resulted in 528 observations. For hypothesis 3, regarding the prediction of OC symptom occurrence via level of insight, $N=71$ individuals were included at the between-person level and 1815 observations were included at the within-person level. Regarding the prediction of insight via OC symptom occurrence, $N=71$ individuals were included at the between-person level and 1814 observations were included at the within-person level. Table 2 displays Pearson correlations of all variables of interest.

Table 2 Correlation matrix

Variable	1	2	3	4
1. Insight	–	−0.04	−0.22**	0.48**
2. Emotional clarity	−0.29*	–	0.13**	−0.002
3. Self-perceived ER effectiveness	0.00	−0.08	–	−0.11*
4. OC symptom occurrence	0.46**	−0.05	−0.12	–

Within-person correlations on a momentary level are shown above the diagonal and between-person correlations on an aggregated trait level are shown below the diagonal. *ER* Emotion regulation; *OC* Obsessive–compulsive. *$p<0.05$ **$p<.01$

Variation of Insight over Time (Hypothesis 1)

The results support our hypothesis that insight considerably varies over time. Across all time points, mean level of conviction was $M=36.05$ ($SD=22.31$) with 74.65% of individuals reporting less than 50% of mean conviction. Regarding the item that their belief is or will come true, individuals reported a mean level of conviction of $M=38.00$ ($SD=23.60$, 60.56%<50%). Mean level of conviction that engaging in compulsions is reasonable to prevent feared beliefs from occurring was $M=34.11$ ($SD=22.76$, 76.06%<50%). Regarding item 1 (i.e., "conviction about the veracity of beliefs"), within-person variance explained 43.85% (heteroscedastic range: 37.00–83.98) of total variance. Concerning item 2 (i.e., "conviction about the reasonableness of behaviors"), 46.92% (heteroscedastic range: 27.00–94.79) of total variance was explained by within-person variance. Average rMSSD score indicating temporal variability of insight was $M=22.03$ ($SD=14.26$) for item 1 and $M=22.00$ ($SD=15.24$) for item 2. Table 3 displays all results in comparison with results of Landmann et al. (2019).

Associations of Insight, Emotional Clarity, and ER Effectiveness (Hypothesis 2)

All estimates, *p*-values and 95% confidence intervals can be found in the supplements (Table A). At the between-person level, expected between-person associations for emotional clarity and ER effectiveness remained non-significant when including OC symptom intensity as control variable (all $ps>0.05$). Accordingly, regarding the within-person level, emotional clarity and perceived ER effectiveness were also not significantly associated with current insight (all $ps>0.05$). Associations of current emotional clarity and ER effectiveness with subsequent insight were also non-significant (all $ps>0.05$).

When exploratively including the dichotomous variable regarding the OC symptom occurrence instead of OC symptom intensity as level 1 covariate (0/1), however, higher level of grand-mean centered emotional clarity was significantly associated with higher level of insight at the between-person level ($b=-4.102$, $p=0.044$, 95% CI −8.10, −0.10]). Associations with ER effectiveness remained non-significant ($p=0.061$). In line with our hypothesis, person-mean centered ER effectiveness at the current level was positively associated with level of insight ($b=-0.18$, $p=0.002$, 95%

Table 3 Comparison of present results with Landmann et al. (2019)

	Present results ($N=71$)	Landmann ($N=50$)
Y-BOCS total score (*SD*)	22.06 (5.45)	21.51 (5.63)
BABS total score (*SD*)	8.51 (3.22)	4.04 (4.01)
Mean level of conviction	$M=36.05$	
%<50	($SD=22.31$)	
	74.65%	
Item 1	$M=38.00$	$M=29.79$
%<50	($SD=23.60$)	($SD=22.74$)
	60.56%	76.1%
Item 2	$M=34.11$	$M=30.37$
%<50	($SD=22.76$)	($SD=22.93$)
	76.06%	76.1%
Within person variance	43.85%	44.28%
Item 1	46.92%	47.42%
Item 2		
rMSSD	$M=22.03$	$M=22.5$
Item 1	($SD=14.26$)	(a) 14.33 (9.59),
		(b) 22.05 (10.29),
		(c) 31.26 (13.08)
Item 2	$M=22.00$	$M=25.60$
	($SD=15.24$)	(a) 16.53 (8.51),
		(b) 27.74 (10.77),
		(c) 32.50 (14.62)

Item 1="*How convinced are you at this very moment that your feared belief is or will come true*?", item 2="*How convinced are you at this very moment that engaging in compulsions is reasonable to prevent your feared belief from occurring*?". rMSSD in Landmann et al. (2019) was calculated for the subcategories (a) taboo thoughts, (b) contamination/cleaning, and (c) doubt/checking, the overall mean value was supplemented based on these results

CI −0.29, −0.07]), though, clarity as expected predictor remained non-significant ($p=0.922$). At the subsequent level, other than expected, insight was not significantly predicted by clarity or ER effectiveness (all $ps>0.05$).

Relationship between Insight and OC Symptoms (Hypothesis 3)

All estimates, *p*-values and 95% confidence intervals for both prediction of OC symptom occurrence and level of insight can be found in the supplements (Table B).

Prediction of OC symptom occurrence via insight. In line with our expectations, lower mean level of insight was significantly associated with higher mean likelihood of present OC symptoms ($b=0.09$, $p=<0.001$, 95% CI [0.04, 0.14]) at the between-person level. At the within-person level, lower level of person-mean centered insight was associated higher likelihood of OC symptom occurrence ($b=0.09$ $p=<0.001$, 95% CI [0.08, 0.11]). Contrary to our hypothesis, insight was not significantly associated with OC symptom occurrence at the subsequent time point ($p=0.318$).

Prediction of insight via OC symptom occurrence. Regarding the between-person level, higher mean likelihood of OC symptom occurrence was significantly associated with lower mean level of insight across all time points ($b=8.39$, $p<0.001$, 95% CI [3.71, 13.08]) supporting our hypothesis. We found the same pattern at the concurrent within-person level: Higher current likelihood of OC symptoms was associated with lower level of insight at the same time point ($b=19.71$, $p<0.001$, 95% CI [18.09, 21.33]). Contrary to our hypotheses, at the subsequent level, higher level of subsequent insight was significantly associated with higher likelihood of OC symptom occurrence at the previous timepoint ($b=-3.48$, $p<0.01$, 95% CI [−5.76, −1.21]).

Discussion

To the best of our knowledge, this is the first study exploring the associations between OC symptoms, emotional clarity, and insight within a temporal and contextual dynamic using an EMA approach. Overall, findings from this study corroborate the variability of insight on the one hand and the interplay between insight, emotion regulation, emotional clarity and OC symptoms on the other hand.

Replication of Insight Variability

Our results regarding the variability of insight mainly replicate the results of Landmann et al., (2019; see Table 3). On the descriptive level, our sample reported relatively higher levels of conviction regarding both items than Landmann et al. (2019), hence lower levels of insight. This might be due to greater trait symptom severity (measured by Y-BOCS) and less trait insight (measured by BABS) in our sample (see Table 3). These diverging result patterns may also explain slight differences regarding insight variation over time, as evident from the 1-ICC and rMSSD. However, overall our results underline the fact that insight in OCD is not a stable trait, but a variable state depending on various situation-specific variables (Marková et al., 2009). This is not only relevant in terms of adapting the former retrospective assessment to the variable phenomenology of insight, but also regarding the treatment of OCD: Raising awareness for insight variability, e.g., through psychoeducation or app-based self-monitoring, could help individuals to better understand their disorder in general. Beyond that, improvement of insight levels could potentially lower dropout and boost response rates: Individuals with higher insight might be able to act more consciously in relevant situations and shift dysfunctional behavior, eventually resulting in a decrease of symptom severity (i.e., "I know that I have severe fears right now, but that these will decrease over time"). Here, more application of psychoeducational content (e.g., information about the etiology of OCD and

maintaining factors) already showed positive effects on insight level (Landmann et al., 2020).

Restricted Associations of Insight, Emotional Clarity and ER Effectiveness

Overall, higher levels of emotional clarity were associated with higher levels of insight only when controlling for OC symptom occurrence instead of OC symptom severity. However, the impact of emotional clarity on concurrent insight remained non-significant. Associations of insight and ER effectiveness emerged at the within-person level only when controlling for the OC symptom occurrence instead of OC symptom severity. As previously argued, these inconsistent results may be due to our branched EMA design that resulted in limitations of statistical power. To circumvent this limitation, future studies should explore these effects in larger samples or with non-branched EMA designs. The fact that our explorative analyses with an extended data base revealed significant associations strengthens the potential of this assessment method.

Nonetheless, our results are partly in line with previous studies pointing towards associations among insight, emotion dysregulation, and emotional clarity (e.g., Manarte et al., 2021; Moritz et al., 2018; Yazici & Yazici, 2019). Extending the existing literature, we were able to demonstrate a novel concurrent association between higher *perceived* ER effectiveness and higher levels of insight irrespective of current OC symptom occurrence (within-person). Further, our results point towards a symptom-occurrence independent association between higher emotional clarity and higher levels of insight beyond symptoms of alexithymia. However, replication of these findings is important as our results did not remain significant when controlling for OC symptom *intensity*. Additionally, future research using experimental designs should focus on causal links between these potential factors and insight to strengthen our observations.

Associations of OC Symptoms and Insight

Supporting our last hypothesis, we were able to consistently show a consistent relationship between insight and the OC symptom occurrence at both between- and within-person level, thereby extending previous results mainly focusing on the association of insight and OC symptoms (e.g., Catapano et al., 2010; Visser et al., 2017). However, this result pattern did not emerge for the subsequent level. Contrary to our expectations, the occurrence of OC symptoms was associated with higher subsequent insight. Due to the aforementioned statistical power and time interval restrictions, this finding should be interpreted with caution. However, one potential explanation might be that individuals with current OC symptoms could have engaged in compulsions (e.g., checking the door again) and then realized that this behavior is not preventing their fear from occurring, resulting in better insight a while after the first prompt. This would especially align with item 2 (i.e., "conviction about the reasonableness of behaviors").

Despite this partly inconclusive pattern, our results underline a possible negative feedback loop between OC symptoms and insight at the current level. Clinically, it emphasizes the negative short-term consequences of compulsions in OCD, further illustrating that higher levels of insight may be beneficial to break this "vicious cycle". Critically, this might imply that fostering insight, i.e., regarding the long-term dysfunctional nature of compulsions, could be central to increasing motivation to engage in more functional, engagement-oriented ER strategies instead. In this regard, Landmann et al. (2020) were able to show higher levels of insight in the presence of OC symptoms after MBCT training indicating improved ability to detach from current OC symptoms which could improve the willingness to endure symptoms until they are alleviated. To further investigate these directional postulates, experimental studies manipulating the degree of insight, assessing its impact on OC symptoms, and vice versa, are needed.

Limitations

This study has limitations. First, the insight items used in this study were based on its definition in the DSM-5 due to the strongest relevance to clinical practice. However, insight can also be defined as the ability to understand the disorder or general treatment adherence (David, 2020; Huang et al., 2023; Landmann et al., 2019). Hence, it appears warranted to examine these additional aspects of insight in the future. Second, to increase compliance while reducing participant burden and potential response biases, we decided to send six EMA prompts per day, resulting in a maximum of two hours between prompts. Hence, the temporal resolution of our data might have been too low to detect clear associations in a shorter time frame. Furthermore, we chose a branched EMA design. This limited the participant's burden on the one hand, but reduced the amount of potentially usable time points for the analyses on the other hand. Thus, these EMA design decisions limited our statistical power, which could be a potential explanation for non-significant results at the subsequent level. Third, we acknowledge a limited generalizability of our results, as we excluded certain comorbidities (e.g., borderline personality disorder, substance use disorders) and did not assess participants' racial identity or socioeconomic status (only educational status). Future studies should assess these variables and replicate findings with more externally valid samples. However, our data were able

to show the potential of EMA in OCD beyond common retrospective approaches neglecting the temporal variation of insight. Although our study could not exploit the full potential of EMA due to its limited power, we found promising results which encourage to intensify this research approach.

Conclusion

This study extended prior results regarding insight in OCD with novel additions to the replication of Landmann et al. (2019) focusing on relationships between insight and other disorder-associated constructs, i.e., OC symptoms, ER effectiveness, and emotional clarity. We were able to replicate extensive insight variability over time. Additionally, we could show associations between insight in OCD and especially OC symptom occurrence at the current level while associations at the subsequent level were less conclusive, but certainly also of interest. Prediction of insight via ER effectiveness or emotional clarity was partially supported, however, larger sample sizes are needed to further test the robustness of these findings. Together, these results illustrate that insight should no longer be seen as a mere trait in OCD, but as a dynamic, contextualized state, with its variability being recognized both in the assessment and treatment of OCD. However, to support our finding on a more causal perspective, research with experimental manipulation on these variables is needed to better understand causal relationships.

From a clinical perspective, our results further provide interesting outlooks on possible extensions of research on treatment options for OCD. Critically, they imply that it may be promising to target insight more extensively in treatment to encourage compliance and reduce burden of traditional ERP treatments. Conversely, with regard to future studies, it would be worth investigating whether successful ERP also improves the level and stability of insight. Further, addressing emotional clarity and ER effectiveness in therapeutic interventions might open new perspectives beyond the pure reduction of specific symptoms. In this regard, the *Unified Protocol for Transdiagnostic Treatment of Emotional Disorders* has already provided evidence regarding the benefits of ER training (e.g., Barlow et al., 2017). Additionally, prior research has shown that mindfulness-based interventions may enhance emotional clarity (see Cooper et al., 2018, for a meta-analysis). In conclusion, these interventions could address central intervention leverages to continuously improve insight throughout treatment.

Supplementary Information The online version contains supplementary material available at https://doi.org/10.1007/s10608-025-10595-0.

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Declarations

Conflict of interest We hereby declare that there are no conflicts of interest, and that this study was conducted in accordance with APA standards for ethical treatment of human participants. The study was approved by the Ethics Committee of the University of Münster and was partly funded by the Christoph Dornier Foundation for Clinical Psychology, a non-profit organization. The foundation was not directly involved in the data collection or analysis. C.B. and N.H. conceptualized the present study and performed the data collection. C. B. ran the data analyses and wrote the manuscript. P.D. and N.K. supervised data analysis while F.D. and U.B. supervised conceptualization and implementation of the study. Reviewing and editing of the manuscript was conducted by all authors. Study design, hypotheses, and analysis plan were preregistered on Open Science Framework (https://doi.org/10.17605/OSF.IO/UC4VF). Here, we also provide our study material, data and analysis code (osf.io/p7sj2).

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