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Short communication

Emotional response in depersonalization: A systematic review of electrodermal activity studies

Mathilde Horn[a,b,*], Thomas Fovet[a,b], Guillaume Vaiva[a,b,c], Pierre Thomas[a,b], Ali Amad[a,b], Fabien D'Hondt[b,c]

[a] Univ. Lille, INSERM U1172, CHU Lille, Centre Lille Neuroscience & Cognition (PSY), F-59000 Lille France
[b] CHU Lille, Pôle de Psychiatrie, F-59000 Lille, France
[c] Centre National de Ressources et Résilience pour les Psychotraumatisme Lille Paris (CN2R), F-59000 LILLE, France

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ABSTRACT

Background: Depersonalization is a complex phenomenological experience initially described as a psychological disturbance of self-awareness. Among the different dimensions underlying depersonalization, emotional numbing appears to be a key symptom but remains a poorly understood phenomenon.
Method: We conducted a systematic review, following PRISMA guidelines, of studies investigating electrodermal activity, a well-documented marker of bodily arousal expression of emotion. Studies were selected from the PubMed, Scopus, Web of Science and PsychINFO databases.
Results: Among the 64 studies initially identified, 11 were finally included, involving 148 patients with depersonalization disorder and 173 healthy subjects for whom depersonalization symptoms were assessed. The main results of these studies suggest that depersonalization is marked by a high skin conductance level and attenuated skin conductance responses to negative stimuli.
Limitations: Due to discrepancies in methodology, we were not able to conduct quantitative analyses. Moreover, the studies included had limited sample sizes, restricting the generalizability of the results.
Conclusion: Though further evidence is required, it appears from electrodermal studies that depersonalization is associated with hypervigilance and emotional detachment during threatening situations. However, because emotional numbing might not be restricted to negative events, we proposed perspectives for future research, stressing the need to explore emotional responses of patients with depersonalization to positive situations.

1. Introduction

Depersonalization is a complex symptom that was initially described as a psychological disturbance of self-awareness (Simeon et al., 1997) mainly characterized by feelings of disembodiment and emotional numbing (Phillips et al., 2001). Depersonalization operates on a continuum. Transient episodes of depersonalization are common in the general population, with a lifetime prevalence between 26% and 74% (Dewe et al., 2018). These episodes appear to occur particularly when under conditions of stress, fatigue, or drug usage (Schweden et al., 2018). Symptoms lead to the diagnosis of depersonalization-derealization disorder (DPRD) when they become chronic or cause significant distress (Reutens et al., 2010). According to the Diagnostic and Statistical Manual of Mental Disorders, fifth edition (DSM–5) criteria, DPRD corresponds to experiences of unreality, detachment, or being an outside observer with respect to one's own thoughts, feelings, sensations, body, or actions (American Psychiatric Association, 2013). DPRD is common in psychiatric disorders and affects between 30% and 80% of patients. Moreover, DPRD may be related to the severity of some affective disorders, such as anxiety and depression (Mula et al., 2007). While patients with DPRD appear to show normal emotional responses at the behavioral level, they often report an attenuation of emotional experience, a phenomenon known as emotional numbing (Sierra et al., 2005). Emotional numbing is considered as one of the most important dimensions of DPRD (Sierra et al., 2005; Simeon et al., 2008).

Emotional experience refers to the collection of subjective, behavioral, and neurophysiological responses elicited by affectively-laden stimuli. If there is still an intense debate on the precise functional role of the brain regions that have been associated with emotional experience (e.g., Barrett, 2017), it has been proposed that the outcome of this brain processing can be partly measured through the use of autonomic markers, and in particular, electrodermal activity (EDA;

* Corresponding author at: CHU Lille, Pôle de Psychiatrie, F-59000 Lille, France.
E-mail address: horn.mathilde@gmail.com (M. Horn).

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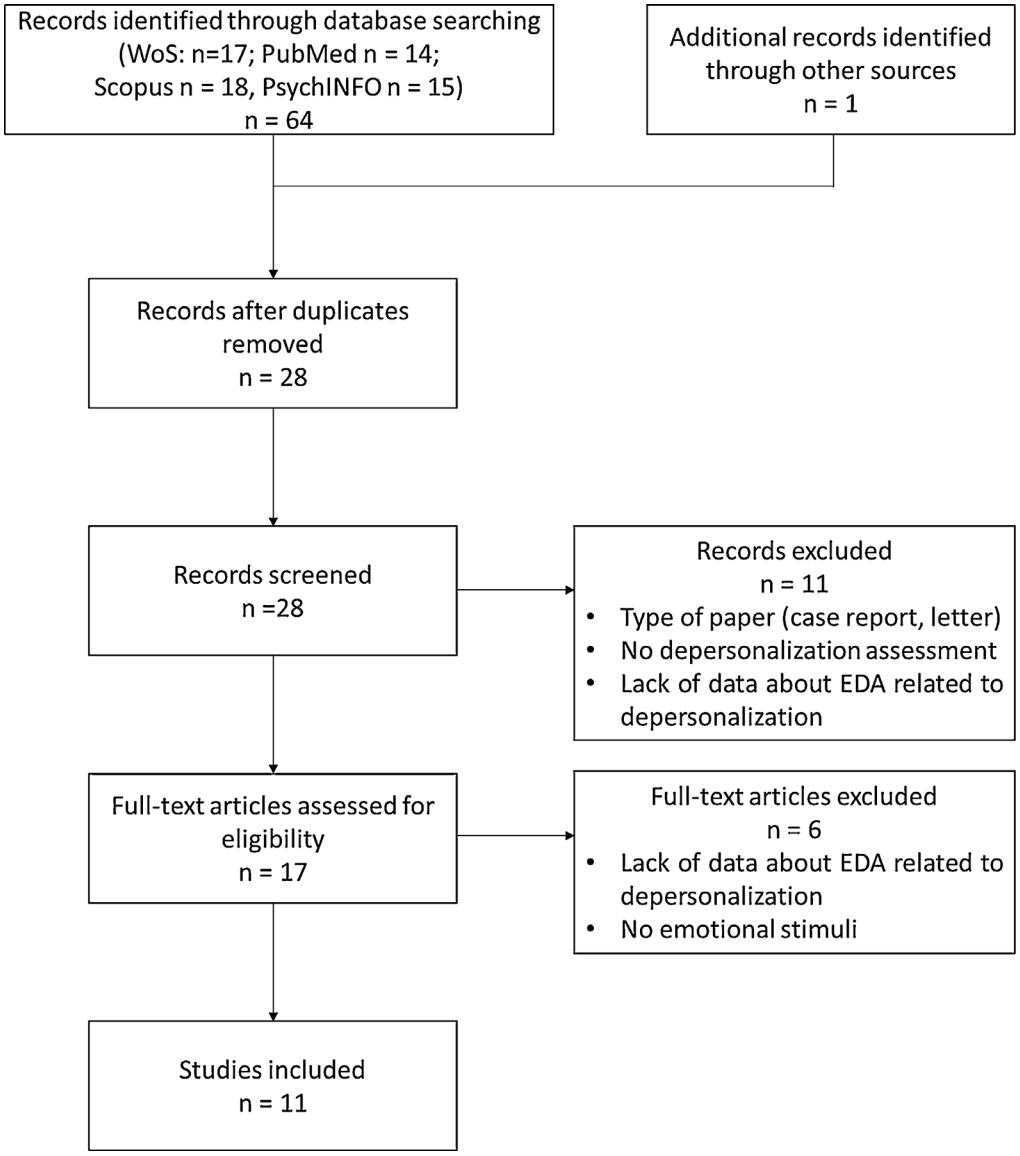

Fig. 1. Flowchart of study selection process.

Critchley, 2002). Indeed, EDA is a signal produced and modulated by the eccrine sweat glands, which are innervated by the sympathetic nervous system, and it is classically considered that EDA constitutes a robust bodily marker of brain activity related to critical processes such as vigilance or emotion for instance (Sequeira et al., 2009). Even though EDA is an indirect index of brain activity and possibly reflects many sources of variance, evidence suggests that EDA recordings are an effective way to assess the arousal dimension of emotional experience.

EDA is generally measured using the skin conductance method and can be separated into tonic and phasic components. Tonic EDA can be estimated by the skin conductance level (SCL), which reflects general variations in autonomic arousal. Non-specific skin conductance responses (NS.SCRs) are phasic sympathetic responses that are nonetheless considered tonic measures because they cannot be linked to an identifiable stimulus. Tonic measures are typically used to investigate individual differences regarding the general level of arousal. Phasic EDA is measured by analyzing the skin conductance responses (SCRs), which are elicited by identifiable stimuli and are mainly defined according to their onset latency and peak amplitude (Boucsein et al., 2012). Evidence shows that the amplitude of SCR induced by emotionally-laden stimuli increases linearly as subjective ratings of emotional arousal increased (Bradley and Lang, 2000; Lang et al., 1993; Manning and Melchiori, 1974; Winton et al., 1984). Moreover, the greater early brain responses induced by equally arousing positive and negative stimuli compared to neutral stimuli correlate with later increases in SCR amplitude (D'Hondt et al., 2010).

If several studies have investigated EDA to better understand the emotional numbing associated with depersonalization, no review has been proposed, which hampers the obtainment of a comprehensive overview of this topic. The main aim of the present paper was thus to perform a systematic review of all the studies investigating emotional responses in depersonalization through the use of EDA measures.

2. Methods

The present review summarizes the results from studies that assessed emotional responses in depersonalization by using EDA measures. We used the PICOS procedure (Liberati et al., 2009) to determine the inclusion criteria, as follows: (1) regarding the Population, we only considered studies with human samples, and these studies had to include participants with depersonalization symptoms, either patients with a diagnosis of depersonalization disorder (DPD) (DSM-IV-TR) or DPRD (DSM 5) or healthy individuals with depersonalization symptoms, as assessed by a validated depersonalization scale, namely the

Cambridge Depersonalization Scale (CDS, Sierra et al., 2000); (2) regarding the Intervention, studies had to analyze autonomic nervous system activity in participants confronted with emotional stimuli using EDA measure; (3) regarding the Comparator, studies had to offer a direct comparison between an experimental group with depersonalization symptoms and a matched control group, or between an experimental condition presenting emotional stimuli and a matched control condition presenting non-emotional stimuli in individuals with depersonalization symptoms; (4) regarding the Outcome, studies had to propose at least one EDA measure as a dependent variable; (5) regarding the Setting, only studies proposing comparisons between groups or experimental conditions (i.e., interventional, observational, cross-sectional) were considered, thus excluding single-case or case series studies and studies without experimental data. No publication dates were imposed, but the final search was performed in April 2020. The selection criteria included peer-reviewed articles written in English or French.

We followed the guidelines of the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA), and adhered to their 27-item checklist (Moher et al., 2009). The bibliographic search was performed in four databases (PubMed, Scopus, Web of Science and PsychINFO) using the search terms skin conductance response (i.e., *"Skin conductance Response" OR "Galvanic Skin Response" OR "Skin Electric Conductance" OR "Skin Electric Conductance" OR "Electrodermal Response" OR "Psychogalvanic Reflex)"* and "depersonalization" (for the search in PubMed, we used the Mesh terms "Galvanic Skin Response" and "Depersonalization", Appendix 1). As we wanted to focus on peer-reviewed papers, the grey literature (e.g., conference proceedings, unpublished PhD dissertations) was not considered, but we considered articles that were cited in the selected articles and explored preregistered trials fulfilling our inclusion criteria on clinicaltrials.gov. Studies that did not perform analyses of SCRs to emotional stimuli or SCLs were excluded. The selection was done by two reviewers (first and last authors) who independently selected articles from titles, abstracts, and full-texts according to the inclusion and exclusion criteria described above. This study is registered with PROSPERO (id. 183112) (National Institute for Health Research 2019).

Sixty-four studies were extracted from the four databases (Web of sciences $n=17$, PubMed n = 14, Scopus n = 18, PsychINFO n= 15), and one study was identified through the first selected articles references. Eleven articles were finally included. The selection process is summarized in Fig. 1. The following information was extracted from each article: the number of participants (DPD or DPRD patients, anxious patients, and controls), study design and stimuli, EDA variables, and a summary of main findings. We assessed the methodological quality of each study using the Newcastle–Ottawa Scale (NOS; Wells et al., 2000), which has been developed by the Universities of Newcastle, Australia and Ottawa, Canada to assess the quality of non-randomized studies according to three perspectives: the selection of the study groups, the comparability of the groups, and the ascertainment of either the exposure or outcome of interest for case-control or cohort studies respectively. Additionally, we performed a specific assessment of EDA measurements following recommendations published by Bouscein et al. (2012), focusing on five items: (1) the minimum amplitude criterion for SCR; (2) the sampling rates; (3) the method of measurement for SCR; (4) the method of measurement for SCL and (5) the method of measurement for NS.SCRs. Due to the heterogeneity of designs and variables, neither meta-analysis nor quantitative synthesis was possible.

3. Results

The results of the review are presented in Table 1. Nine of the 11 included studies were conducted on 148 patients with DPD according to the DSM-IV criteria. All included patients exceeded the clinical cut-off level of > 70 on the Cambridge Depersonalization Scale (CDS; (Sierra and Berrios, 2000)). The 2 other studies were conducted on healthy participants (n = 173) for whom depersonalization symptoms were assessed (Dewe et al;, 2016; Dewe et al., 2018). Of note, EDA related to derealization symptoms was reported in two studies (Dewe et al., 2016; Dewe et al., 2018). Regarding the methodological quality of studies, NOS scores revealed only fair global quality, mainly because of the small samples' sizes. Regarding the EDA measurements, several methodological shortcomings should be noted: the lack of threshold to detect SCR or NS.SCRs (Giesbrecht et al., 2010), a sampling rate inferior to 200 Hz for all except four studies (Giesbrecht et al., 2010; Michal et al., 2013; Dewe et al., 2016, Dewe et al., 2018); a measurement bias of SCL for two studies [SCL estimated by the average of EDA signal (Medford et al., 2006) or the amplitude of EDA during the task (Lemche et al., 2008)] and the use of stimuli that have not been previously validated (Giesbrecht et al., 2010; Schoenberg et al., 2012).

Regarding tonic EDA, 3 studies found that patients with depersonalization presented higher SCL than healthy subjects (HS) (Giesbrecht et al., 2010; Lemche et al., 2008; Schoenberg et al., 2012), and 2 studies did not find any SCL difference between patients and HS (Michal et al., 2013; Sierra et al., 2002). Regarding the frequency of NS.SCRs, 2 studies found a greater number of NS.SCRs in patients with depersonalization (Michal et al., 2013; Schoenberg et al., 2012), while two studies did not find any group differences (Jay et al., 2014; Sierra et al., 2002).

Regarding phasic EDA, 2 studies found that patients with DPD showed reduced SCRs to unpleasant pictures compared to HS (Medford et al., 2006; Sierra et al., 2002). Three studies found a negative correlation between SCR amplitude to aversive stimuli and the intensity of depersonalization symptoms: one in a clinical group (Jay et al., 2014) and the 2 others in healthy participants (Dewe et al., 2018, 2016). Conversely, one study did not highlight any difference between patients and HS in response to unpleasant stimuli (Sierra et al., 2006), and one study found that patients presented greater SCR amplitudes than HS (Michal et al. 2013).

4. Discussion

This work aimed to review studies investigating depersonalization using EDA measures. Eleven studies among the 64 identified during the initial search phase met the selection criteria. Although some studies failed to identify any association between depersonalization and EDA measures, most of them did, leading to the conclusion that depersonalization may be characterized by both high tonic EDA and reduced phasic EDA to negative stimuli.

Regarding tonic EDA, most studies found that depersonalization is associated with high tonic EDA either by showing a higher resting SCL or a greater number of NS.SCRs in patients than in HS. These results suggest that depersonalization is associated with an abnormally high general level of sympathetic arousal (Schoenberg et al., 2012), which is supposed to reflect a heightened state of alertness (Michal et al., 2013; Schoenberg et al., 2012). Regarding phasic EDA, most studies found that patients with DPD showed reduced SCRs to unpleasant stimuli compared to HS during either the explicit or the implicit processing of their affective value. This suggests an attenuated sympathetic response to negative events regardless of whether attention is focused on the emotional content of stimuli. Interestingly, several studies found that patients are nonetheless able to correctly assess the emotional valence of stimuli but report lower arousal rating scores than HS for unpleasant stimuli (Michal et al., 2013; Sierra et al., 2006, 2002). Thus, both EDA and subjective data indicate a flattened emotional experience in terms of the arousal dimension in depersonalization when facing negative stimuli (Sierra et al., 2002). Of note, Michal et al. (2013) found a higher SCR amplitude to acoustic stimuli for patients with DPD than for patients without DPD. This difference between DPD patients and controls was observed for both emotional and non-emotional stimuli, which suggests the involvement of mechanisms other than a specific emotional response. Moreover, unlike all other studies, the study by Michal et al. (2013) used auditory stimuli, which are less susceptible to

Table 1
Summary of selected studies.

First author	Year	Population N/mean age	Intervention Measures	Stimuli	Outcomes Main study findings	Comparator
Sierra	2002	*DPD*: 15 /33.8 *HS*: 15/34.3 *Anx*: 11/35.6	SCR amplitude, SCR frequency, SCR latency, NS.SCR, SCL	IAPS pictures (pleasant, unpleasant, neutral)	*SCL*: DPD < Anx; *SCR amplitude*: negative > positive; *SCR amplitude unpleasant*: DPD < HS = Anx; *SCR frequency unpleasant*: DPD < HS = Anx; *NS.SCR*: no difference	Case-control: the rating of valence and arousal of emotional pictures
Sierra	2006	*DPD*: 16 /32.4 *HS*: 15/33.2 *Anx*: 15/33.6	SCR amplitude, SCR frequency	Facial expressions (happy or disgust)	*Subjective anxiety*: DPD = Anx > HS; *SCR amplitude for disgust*: DPD = HS < Anx	Case-control: the identification of emotion of facial expressions in static or moving images
Lemche	2007	*DPD*: 9/36.1 *HS*: 12/27.7	SCR amplitude, SCR latency	IAPS pictures (pleasant, unpleasant)	*DPD*: ↘ SCR correlated ↗ activity in dorsal prefrontal cortex (SCR amplitude for happy, SCR latency for sad)	Case-control: the identification of the sex of faces with emotional expressions (fMRI study)
Lemche	2008	*DPD*: 9/36.1 *HS*: 12/27.7	SCL	IAPS pictures (pleasant, unpleasant, neutral)	*Amplitude SCL*: DPD > HS	Case-control: the identification of the sex of faces with emotional expressions (fMRI study)
Giesbrecht	2010	*DPD*: 14/30.5 *HS*: 14/28.3	SCL	Clip of aversive content	*Mean rise time to peak*: DPD < HS *SCL*: DPD > HS	Case-control: passive viewing of a clip from the movie "The Silence of the Lambs"
Schoenberg	2012	*DPD*: 32 *HS*: 16	SCR amplitude, SCL, NS.SCR	Arcade game with feedback	*SCL*: DPD > HS; *NS.SCR:* DPD > HS;	RCT: biofeedback during arcade game (real versus placebo)
Michal	2013	*DPD*: 22/29.7 *CTL*: 15/28.7	SCR amplitude, SCL, NS.SCR	IADS sounds (negative, positive, neutral)	*SCR amplitude*: DPD > PC; *SCR amplitude*: negative > positive *SCL*: no difference; *NS.SCR*: DPD > PC	Case-control: mindfulness during listening to acoustic emotional sounds
Jay	2014	*DPD*: 17 *HS*: 20	SCR amplitude, NS.SCR	IAPS pictures (aversive or neutral)	*DPD*: ↗ SCR and ↘ CDS scores after stimulation PFC; *NS.SCR*: no difference	Case-control: the rating of arousal of emotional pictures before and after rTMS
Medford	2016	*DPD*: 14/33.7 *HS*: 25/29.8	SCR amplitude, SCR frequency	IAPS pictures (aversive or neutral)	*SCR maximal amplitude*: DPD < HS; *SCR mean amplitude*: DPD < HS for aversive stimuli	Case-control: the identification of the type of scene (indoors or outdoors) with emotional content
Dewe	2016	*HS*: 100/19	SCR amplitude, SCR frequency, NS.SCR	Body-related threat	↘ *SCR amplitude* to threats correlated with: ↗ CDS total score ↗ ABE scores (depersonalization) ↗ AFS scores (derealization)	Cohort: simulated bodily threats to the participant
Dewe	2018	*HS*: 73/23	SCR amplitude, SCR frequency, NS.SCR	Body-related threat (to self or to others)	↘ *SCR amplitude* to the self correlated with ↗ ABE (depersonalization) scores ↘ *SCR amplitude* to others correlated with ↗ AFS (derealization) scores	Cohort: simulated bodily threats to the participant's own body versus to another individual

SCR: skin conductance response; SCL: skin conductance level; NS.SCR: non-specific skin conductance response; DPD: depersonalization disorder; Anx: anxious participants; IAPS: International Affective Picture System; P: patients; HS: healthy subjects; CTL: control group (patients without DPD); CDS: Cambridge Depersonalization Score; ABE: Anomalous Body Experience (sub-scale of CDS exploring depersonalization-type experiences); AFS: Alienation from Surroundings (sub-scale of CDS exploring RCT: randomized controlled trial.

attentional modulation than visual stimuli, and was conducted while subjects were asked to close their eyes, which has been shown to enhance the rating of emotionality (Michal et al., 2013).

Thus, it appears that those results agree with the idea that depersonalization results from an excitatory mechanism inducing a state of heightened alertness together with an inhibitory mechanism reducing emotional reactivity (Giesbrecht et al., 2010; Schoenberg et al., 2012; Sierra et al., 2002). The latter mechanism could be related to depersonalization severity, as suggested by studies that found a significant correlation between SCR amplitude to negative stimuli and the intensity of depersonalization symptoms (Dewe et al., 2018, 2016; Jay et al., 2014). This dual mechanism may be considered an adaptive response to potentially stressful situations (Sierra et al., 2006), but depersonalization remains a global experience of unreality and detachment from emotions that is not limited to negative events *per se* (American Psychiatric Association, 2013). For example, during depersonalization, patients may experience a lack of interest in activities that are ordinarily considered pleasant [CDS, item 5 (Sierra and Berrios, 2000)]. However, only 3 of the 11 included studies investigated SCR to both positive and negative stimuli (Michal et al., 2013; Sierra et al., 2006, 2002). Furthermore, these studies used unpleasant stimuli inducing stronger (Michal et al., 2013; Sierra et al., 2002) or weaker (Sierra et al., 2006) SCR than pleasant stimuli in HS, suggesting that unpleasant stimuli and pleasant stimuli were not matched regarding arousal (D'Hondt et al., 2010). Accordingly, the probability of highlighting significant differences in terms of arousal between patients and HS for positive stimuli was diminished, limiting the possibility of determining whether patients with depersonalization present an overall reduced reactivity to emotionally arousing stimuli regardless of their valence.

Alternatively, it should also be considered that the tonic sympathetic hyperactivity associated with depersonalization prevents the possibility of observing phasic EDA changes in response to emotional stimuli. This proposal was formulated to account for the cognitive symptoms of depersonalization in the study by Lemche et al. (2016) which coupled fMRI and EDA measures during an interference task. The authors observed poorer performance in patients with DPD than in HS, possibly because of an inability to suppress stress-related arousal states (Lemche et al., 2016). Furthermore, neuroimaging data support the idea that hypervigilance may restrict the possibility of engaging in emotional processing (Lemche et al., 2016; Medford et al., 2006). The currently dominant viewpoint posits that depersonalization is related to the hyperactivation of prefrontal areas, which results in the inhibition of limbic areas and attenuated responses to emotional stimuli (Jay et al., 2014; Medford et al., 2006; Phillips et al., 2001).

Several limitations of the present review have to be knowledge.

Table 2
Quality of selected studies assessed by (1) the score of the New Castle-Ottawa Quality Assessment Scale (NOS), and (2) a specific assessment of electrodermal activity assessment methods.

First author	Year	Quality of study NOS score	SCR threshold	Quality of EDA assessment				
				SCR recordingSCR value reported	SCL assessment	NS SCRs assessment	Sample rates	Quality of EDA score
Sierra	2002	Fair 60%	0.04 µS	Event-related measure (1–4 s after stimulus) Amplitude and magnitude	Baseline	Frequency	1/100 ms = 10 Hz	4/5
Sierra	2006	Good 70%	0.04 µS	Event-related measure (1-4s after stimulus) Magnitude	Not reported	Frequency	1/100 ms = 10 Hz	3/5
Lemche	2007	Fair 50%	0,01 µS	Event-related measure (1.3–3.3 s after stimulus) Amplitude	Not reported	Not reported	100 Hz	2/5
Lemche	2008	Fair 60%	0,01 µS	Event-related measure	Amplitude	Not reported	100 Hz	2/5
Giesbrecht	2010	Good 70%	None	Continuous measure Amplitude	Baseline	Not reported	200 Hz	2/5
Schoenberg	2012	Fair 60%	0.05 µS	Continuous measure Amplitude	Baseline	Frequency	128 Hz	3/5
Michal	2013	Fair 50%	0.02 µS	Event-related measures (1-8s after stimulus) Amplitude	Baseline	Frequency	200 Hz	5/5
Jay	2014	Fair 50%	0.04 µS	Event-related measures (15s after stimulus) Amplitude	Not reported	Frequency	1/100 ms = 10 Hz	3/4
Medford	2016	Fair 50%	0.02 µS	Continuous measure Amplitude	Mean value	Not reported	100 Hz	1/4
Dewe	2016	Good 75%	0,01 µS	Event-related measures (20 s after stimulus)	Not reported	Frequency	2000 Hz	4/5
Dewe	2018	Good 75%	0,01 µS	Event-related measures (30 s after stimulus)	Not reported	Frequency and amplitudes	2000 Hz	4/5

Quality of studies was considered as poor for scores below 50%, fair for scores between 50 and 69%, good for scores between 70% and 79%, strong for scores of 80% and beyond.SCR: skin conductance response; SCL: skin conductance level; NS.SCR: non-specific skin conductance response; NOS: New Castle-Ottawa Quality Assessment Scale.

First, the small number of studies and the heterogeneity of their paradigms did not allow us to conduct quantitative analyses. Second, the methodological quality of several studies is questionable, notably regarding the samples' size and EDA measurements. Only four studies (Michal et al., 2013; Giesbrecht et al., 2010; Dewe et al., 2016; Dewe et al., 2018) used a sample rate that ensures accurate separation of phasic waveforms from tonic signals (i.e., sample rates ≥ 200 ms; Figner and Murphy 2011). Importantly, all the studies that reported higher SCL for patients with DPD in comparison to HS, presented shortcomings regarding the EDA assessment methods: two studies were conducted with stimuli that have not been previously validated and all the studies only reported SCL amplitude during the task. We were not able to measure the impact of these biases on the outcomes of the studies, but this suggests that the results concerning tonic EDA should be taken with caution and clearly need to be confirmed. Third, all patients included in the reviewed studies were diagnosed with DPD while DSM 5 now considered depersonalization as a symptom of DPRD. In the two reviewed studies conducted in healthy participants, the authors observed a negative correlation between SCR amplitude to threat to *others* and the intensity of derealization symptoms, while SCR amplitude to threat to the *self* was correlated to the intensity of depersonalization symptoms (Dewe et al., 2018). The authors then suggest an attentional bias towards internal sources for depersonalization and external sources for derealization, but the distinction or interconnection between depersonalization and derealization needs to be further examined.

Finally, the very few studies investigating SCRs to self-related stimuli is very surprising considering that depersonalization is supposed to be a self-related disorder (Sierra et al., 2002). Only two studies proposed self-related stimuli by examining autonomic arousal during simulated body-threats and found a negative correlation between SCR amplitude to aversive stimuli and the intensity of depersonalization symptoms (Dewe et al. 2016; Dewe et al., 2018). Beyond the reduced reactivity to emotional stimuli, which is also observed in other dissociative states (Choi et al., 2017), patients with depersonalization are characterized by their detachment from themselves (Sierra et al., 2002). Thus, an interesting research avenue would be to continue to investigate electrodermal responses in these patients confronted with pictures of their faces or hearing their name, for example.

In conclusion, the present review suggests that depersonalization may be characterized by hypervigilance together with a flattened emotional reactivity to negative stimuli. The limitations of the current literature hamper going beyond this conclusion and providing a clearer explanation of the dimension of emotional numbing in depersonalization. In particular, it appears important to determine whether depersonalization symptoms could also concern a reduced reactivity to pleasant stimuli, which may explain why patients show an emotional detachment independent of the valence of situations.

Contributors

MH and FDH designed the study, performed literature search and drafted the manuscript. TF and AA supervised the drafting of the manuscript. GV and PT critically revised the manuscript. All authors have contributed to this scientific work and approved the final version of the manuscript.

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Search strategy for each database

Search Engine	Search String
PubMed	"Galvanic Skin Response"[MeSH Terms] AND depersonalization"[MeSH Terms]
Scopus	TITLE-ABS-KEY (("Skin conductance Response*" OR "Galvanic Skin Response*" OR "Skin Electric Conductance*" OR "Electrodermal Response*" OR "Psychogalvanic Reflex") AND "depersonalization")
Web of Science	((TITLE-ABS-KEY (("Skin conductance Response*" OR "Galvanic Skin Response*" OR "Skin Electric Conductance*" OR "Electrodermal Response*" OR "Psychogalvanic Reflex") AND "depersonalization")
PsychINFO	("Skin conductance Response" OR "Skin conductance Responses" OR "Galvanic Skin Response" OR "Galvanic Skin Responses" OR "Skin Electric Conductance" OR "Skin Electric Conductances" OR "Electrodermal Response" OR "Electrodermal Responses" OR "Psychogalvanic Reflex") AND "depersonalization"

agencies in the public, commercial, or not-for-profit sectors

Declaration of Competing Interest

The authors declare no conflict of interests.

Appendix 1

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None.

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