**Utrecht University**

**The Relationship between Touch Deprivation and Transdiagnostic Symptoms in**

**Psychiatric Populations**

Master Thesis Neuropsychology

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**Abstract**

Many people experienced touch deprivation during the COVID-19 pandemic because of social distancing, meaning they did not receive the amount of touch they would like to receive. Notably, psychiatric patients may be at a general greater risk to be touch deprived because of social isolation. Several transdiagnostic symptoms may be related to touch deprivation, namely self- esteem, emotion dysregulation, and intolerance of uncertainty. This study investigated if touch deprivation was predictive of these transdiagnostic symptoms in psychiatric patients and if there was a difference in touch deprivation between patients and controls. The expectation was that a higher amount of touch deprivation would be predictive of a lower self-esteem, a higher intolerance of uncertainty, and a higher amount of emotion dysregulation in both psychiatric patients and controls. Furthermore, the relationship between touch deprivation and transdiagnostic symptoms was expected to be stronger in psychiatric patients compared to controls. The results indicated that, even though group membership was predictive of transdiagnostic symptoms, touch deprivation was not. It follows no interaction was found between group membership and touch deprivation on transdiagnostic symptoms. Furthermore, no difference was found in touch deprivation between patients and controls. Possible explanations for the absence of the expected results include the small sample size and the questionnaires used. So, continued research on touch deprivation in psychiatric patients is vital to increase our knowledge of the role of touch in relation to psychiatric symptoms, which may hold a place in future treatments.

*Keywords*: touch deprivation, psychiatric patients, transdiagnostic symptoms

**The Relationship between Touch Deprivation and Transdiagnostic Symptoms in Psychiatric Populations**

The COVID-19 pandemic has had many consequences for people all over the world, including a phenomenon called touch deprivation. Touch deprivation occurs when an individual does not receive the amount of touch they would like to receive (Beßler et al., 2020), which a large part of the population experienced because of social distancing (Field et al., 2020a; Meijer et al., 2022). Touch deprivation is associated with poor psychological well-being, such as increased feelings of anxiety (Field et al., 2020b; von Mohr et al., 2021), depression, and stress (Floyd, 2014). These findings fit with the existing literature on affective and social touch, which is pleasant touch in social interactions (Morrison et al., 2010). Namely, social touch has been found to have positive psychological and physiological effects in healthy individuals, such as increased helping behaviour (Guéguen & Fischer-Lokou, 2003) and lower cortisol levels (Ditzen et al., 2007). It follows that the absence of receiving this kind of touch results in the above-mentioned negative consequences. Even though, as above-mentioned, many people experienced touch deprivation in the COVID-19 pandemic, psychiatric patients may be at a general greater risk to be touch deprived because of social isolation (Elisha et al., 2006). Since touch deprivation can have negative consequences on psychological well-being in healthy individuals (Field et al., 2020b), we speculate that touch deprivation may also have negative consequences on symptomatology in psychiatric patients. Furthermore, touch deprivation is linked to several psychiatric problems, such aggression (Diego et al., 2002), eating disorders (Gupta et al., 1995), and depression (Field et al., 1992). So, since touch deprivation is linked to multiple psychiatric problems and conditions, this study will look at transdiagnostic symptoms, which are symptoms that occur in various psychiatric conditions (Eaton et al., 2015). Unfortunately, research on touch deprivation in psychiatric patients is scarce. Therefore, this study will explore the relationship

between touch deprivation and transdiagnostic symptoms in psychiatric patients in order to increase the understanding of the role of touch within this population.

Not much is known yet about touch experiences and touch deprivation in psychiatric patients. Psychiatric patients do seem to experience touch differently, since they experience social, affective touch as less pleasant compared to healthy individuals (Croy et al., 2016; Löffler et al., 2022). However, it is not yet known if they experience more touch deprivation compared to controls. On the one hand, they may be more touch deprived, because they may have fewer social interactions involving touch as a consequence of social isolation (Elisha et al., 2006). On the other hand, psychiatric patients may experience less touch deprivation, since they do not perceive touch as being pleasant (Croy et al., 2016; Löffler et al., 2022) and therefore have little wish to be touched. The first goal of this study is to investigate if patients and controls differ in touch deprivation. The second aim of this study is to investigate the possible effects of touch deprivation in psychiatric patients. In healthy individuals it has already been shown that a high amount of touch deprivation is related to reduced psychological well-being (Field et al., 2020b). Interestingly, in patients it has been shown that they can experience the positive effects of touch, even though they experience touch as less pleasant. To illustrate, massage therapy seems to have antidepressant effects and has even been suggested as a transdiagnostic intervention, since its effectiveness has been shown in numerous (psychiatric) disorders (Eggart et al., 2019). A possible explanation could be that psychiatric patients do not consciously perceive social, affective touch as pleasant, but can nonetheless still experience the health benefits associated with this kind of touch (Löffler et al., 2022). We speculate that the reverse is also possible: patients may also experience the negative effects related to touch deprivation, such as depression and stress (Floyd, 2014). However, more research is needed to be able to draw conclusions on the relationship between transdiagnostic symptoms and touch deprivation in psychiatric patients.

Several transdiagnostic symptoms seem to be implicated in numerous psychiatric conditions and may be related to touch deprivation. One of these symptoms is self-esteem (Kresznerits et al., 2022). Self-esteem can be viewed as a subjective evaluation of what one is worth (Donnellan et al., 2011) and a higher self-esteem has positive consequences on, among other things, mental and physical health (Orth & Robins, 2022). Self-esteem has been found to be lower in several psychiatric conditions, such as depression and personality disorders (Kresznerits et al., 2022). Furthemore, self-esteem has negative correlations with touch deprivation and positive correlations with social touch (Boudreault & Ntetu, 2006; Copstead, 1980; Punyanunt-Carter & Wrench, 2009). So, while low self-esteem has been associated with a higher amount of touch deprivation in healthy individuals (Punyanunt-Carter & Wrench, 2009), it was shown that a higher frequency of social touch has been associated with a higher self-esteem in institutionalised adults (Boudreault & Ntetu, 2006; Copstead, 1980). Notably, interpersonal touch seems to be of great significance to individuals with low self-esteem, as was shown by a study of Koole et al. (2014), where healthy individuals with low self-esteem experienced less existential concerns after being touched by another person.

Another transdiagnostic symptom that seems to be related to social touch and touch deprivation is emotion dysregulation (Sloan et al., 2017). Emotion regulation is a multidimensional construct which includes strategies that individuals use to modify their emotional experience and also includes general emotional functioning (Sloan et al., 2017). Deficits in emotion regulation have been found in multiple psychiatric conditions such as anxiety and depression (Fitzgerald et al., 2018; Sloan et al., 2017) and include dysfunctional strategies such as the suppression of emotions, and also include general negative affective states (Hofmann et al., 2012). Emotion (dys)regulation has also been linked to social touch. Starting in infancy, maternal touch is an important factor in the development of emotion regulation (Hertenstein & Campos, 2001). This emotional regulatory function of touch seems

to continue into adulthood. For instance, interpersonal touch in a relationship was found to have positive effects on the affective states of individuals (Debrot et al., 2013) and attenuates responses to threat (Coan et al., 2006) and social stressors (von Mohr et al., 2017).

Besides self-esteem and emotion dysregulation, intolerance of uncertainty is another transdiagnostic symptom (Carleton, 2016) that may be related to touch deprivation. Intolerance of uncertainty can be defined as negative cognitive, emotional, and behavioural reactions to unknown situations (Fergus, 2013). The COVID-19 pandemic has many unknown elements to it (e.g. the possibility of getting infected) which has had a negative impact on the wellbeing of people via intolerance of uncertainty (Deniz, 2021). To date, no research has been conducted on the relationship between touch deprivation specifically and intolerance of uncertainty, but a connection between these constructs seems plausible. For instance, seeking soft, haptic experiences is found to be a useful coping strategy to decrease intolerance of uncertainty (van Horen & Mussweiler, 2014). We hypothesise that the usefulness of haptic experiences as a coping strategy for intolerance of uncertainty may extend to social touch, and not being able to use this coping strategy may increase intolerance of uncertainty. Therefore, in the current study we expect that a higher amount of touch deprivation is predictive of a lower self-esteem, a higher intolerance of uncertainty, and a higher amount of emotion dysregulation.

To better understand the relationship between transdiagnostic symptoms and touch deprivation, the first aim of this study is to investigate if patients and controls differ in the amount of touch deprivation they experience. We will use an explorative approach to answer this research question, since, as above-mentioned, both a difference and the absence of a difference between the two groups in touch deprivation is plausible based on current knowledge. The second aim of this study is to explore if the amount of touch deprivation is predictive of transdiagnostic symptoms in psychiatric patients and controls. Specifically, as

above-mentioned, it is expected that a higher amount of touch deprivation is predictive of a lower self-esteem, a higher intolerance of uncertainty, and a higher amount of emotion dysregulation in both psychiatric patients and controls. However, psychiatric patients may have a greater need for the psychological benefits of social touch and may therefore be more vulnerable to the detrimental effects of touch deprivation (Eggart et al., 2019). Thus, psychiatric patients with a high amount of touch deprivation may experience more transdiagnostic symptoms compared to controls. Therefore, the relationship between touch deprivation and transdiagnostic symptoms is expected to be stronger in this group compared to controls.

## Method

### Participants

After approval by the Ethics Review Board of the Faculty of Social and Behavioural Sciences of Utrecht University, participants were recruited. Patients between the ages of 18 and 65 were recruited from GGZ Centraal, a Dutch institute for mental health. Patients with a personality disorder, anxiety disorder and/or mood disorder were recruited. Patients with a current psychosis or with an intellectual disability were excluded. Controls between the ages of 18 and 65 were recruited via the personal network of the authors. In total, 73 participants took part in the study. However, 31 participants were excluded from the analyses. Of those, 22 were excluded because they did not finish the questionnaires and 4 were excluded from the control group because they were diagnosed with a psychological disorder. The final sample for analyses consisted of 19 patients and 28 controls were included. The mean age of the controls was 38.11 ($SD$ = 14.03) and the mean age of the patients was 41.39 ($SD$ = 9.73). The difference in age, -3.29, BCa CI 95% [-10.26, 4.29] was not significant, $t(29.56)$ = -.88, $p$ = .38. In the control group, 6 participants were men and 22 were women. In the patient group, 6 patients were men and 13 were women.

**Self-report measures**

This study was part of a larger study. The participants filled out several questionnaires: the Longing for Interpersonal Touch Picture Questionnaire (LITPQ; Beßler et al., 2020), Spielberger State-Trait-Anxiety-Inventory (STAI-6; Marteau & Bekker, 1992), Intolerance of Uncertainty Scale - Short Form (IUS-12; Carleton et al., 2007), World Health Organization Qualitiy of Life Questionnaire - BREF (WHOQoL-BREF; Whoqol Group, 1998), Toronto Alexithymia Scale (TAS-20; Bagby et al., 1994), Cognitive Emotion Regulation Questionnaire (CERQ; Garnefski et al., 2001), Rosenberg self-esteem scale (RSES; Rosenberg, 1989), Self-Compassion Scale – Short Form (SCS-SF; Raes et al., 2011), Free Play in Childhood Scale (Greve et al., 2014), and the Depression, Anxiety and Stress Scale - 21 Items (DASS-21; Lovibond et al., 1995). Furthermore, participants answered questions about their experience of touch before social distancing and the impact of social distancing on their wellbeing and the amount of touch they receive. In the current study, the LITPQ, IUS-12, CERQ, and RSES were used.

*Longing for Interpersonal Touch Picture Questionnaire*

The LITPQ (Beßler et al., 2020) is a novel self-report measure of touch deprivation. The research on its psychometric properties is limited, but the questionnaire seems to have good internal consistency reliability and acceptable convergent validity (Beßler et al., 2020). The LITPQ consists of questions regarding touch frequency and touch wish. An example of a question regarding touch frequency is: "how many times have you been touched this way by a friend?" while showing a picture of people hugging each other. An example of a question regarding touch wish is: "how many times did you want to be touched this way by a friend?" while showing a picture of people hugging each other. The pictures used are drawn pictures consisting of people hugging, stroking, kissing, randomly touching, holding each other, and shaking hands. Participants were asked to answer questions about these kinds of touch with

different interaction partners, namely a romantic partner, child, parent, grandchild, friend, acquaintance, and stranger. We used an adapted version of the LITPQ where participants were able to indicate their touch frequency and touch wish on a visual analogue scale ranging from 0 (i.e. there is a lack of touch frequency or touch wish) to 100 (i.e. there is a lot of touch frequency or touch wish). A Dutch translation of the LITPQ was used in the current study. Touch deprivation was calculated by dividing touch wish by touch frequency, meaning a higher score is indicative of a higher amount of touch deprivation. Specifically, values higher than 1 indicate touch deprivation (Beßler et al., 2020). A score of 0 is interpreted as a perfect balance between touch frequency and touch wish, meaning someone is touch satisfied.

### Rosenberg self-esteem scale

The RSES (Rosenberg, 1989) is a self-report measure to assess self-esteem. Studies have shown a satisfactory convergent and discriminant validity and internal consistency reliability (Gómez-Lugo et al., 2016; Sinclair et al., 2010).  In the current study, a Dutch translation was used, which has also shown high internal consistency reliability and congruent validity (Franck et al., 2008). The RSES contains 10 items which are scored on a 4-point Likert scale (0 = *strongly disagree* up to 3 = *strongly agree*). Items 2, 6, 8, and 9 were reversed. The total score ranges from 0 to 30, with a higher score being indicative of a higher self-esteem.

### Cognitive Emotion Regulation Questionnaire

The CERQ (Garnefski et al., 2001) is a Dutch self-report measure of emotion regulation strategies. Studies have found good internal consistency reliability, acceptable test-retest reliability, and satisfactory convergent, criterion, and construct validity (Garnefski et al., 2001; Ireland et al., 2017). The CERQ contains 36 items and 9 subscales: self-blame, acceptance, rumination, positive refocusing, refocus on planning, positive reappraisal, putting into perspective, catastrophizing, and blaming others (Garnefski et al., 2001). However,

Garnefski et al. (2001) also found a one-factor model with a high reliability. This total score can be defined as the total use of cognitive emotion regulation strategies. In the current study, this total score was used. Positive items (e.g. from the subscales positive refocusing, positive reappraisal, putting into perspective, refocus on planning and acceptance) were reversed, making a higher score indicative of more emotion dysregulation. Scores are on a 5-point Likert scale (1 = *almost never* up to 5 = *almost always)* and total scores range from 36 to 180.

### *Intolerance of Uncertainty Scale - Short Form*

The IUS-12 (Carleton et al., 2007) is a self-report measure of intolerance of uncertainty. Studies have found good internal consistency reliability (Carleton et al., 2007; Huntley et al., 2020) and factor structure (Roma & Hope, 2017). In the present study, a Dutch translation of the IUS-12 was used. The Dutch IUS has been found to have a satisfactory internal consistency reliability and test-retest reliability (de Bruin et al., 2006; Helsen et al., 2013). The questionnaire contains 12 items. The questions are all on a 5 point likert scale (1 = *strongly Disagree* up to 5 = *strongly agree)* and produce a total score, a prospective anxiety subscale, and an inhibitory anxiety subscale. In the current study, the total score was used, which can range from 12 to 60. A higher score is indicative of a higher amount of intolerance of uncertainty.

### Procedure

Participants received information about the study by means of an informative letter. If an individual agreed to participate, they signed an online informed consent form and demographic information was collected: participants answered several questions about their age, gender, diagnosis, COVID-19 infections, and social network. They then continued to fill out the above-mentioned questionnaires. The entire study was online: the control group used Qualtrics, an online survey builder (Qualtrics, n.d.), to fill out the informed consent and

questionnaires. The patients used Roqua for this purpose, which is a platform for Routine

Outcome Monitoring and includes several questionnaires (RoQua, n.d.).

**Data analysis**

IBM SPSS, version 28, was used to perform the statistical analyses (IBM, 2021).

Assumptions were checked before performing the analyses. An independent t-test was

performed to assess if there was a difference in touch deprivation between patients and

controls. Three moderation analyses were used to assess the relationship between touch

deprivation (i.e. touch deprivation scores of the LITPQ) and transdiagnostic symptoms (i.e.

IUS-12, CERQ, and RSES scores) and whether this relationship is moderated by group

membership (i.e. patients or controls). To this end, the PROCESS tool was used in SPSS

(Hayes, 2022).

## Results

The results of the independent t-test showed no difference in touch deprivation scores

in the control condition ($M$ = 1.51, $SD$ = .70) and the patient group ($M$ = 1.79, $SD$ = .77),

meaning the difference between these groups, .28, BCa 95 [-.16, .72], was not significant,

$t(45) = 1.28$, $p = .27$. The means and standard deviations of all questionnaires can be found in

Table 1.

Multicollinearity diagnostics were assessed after centering the independent variable

(i.e. touch deprivation). The variance inflation factor (VIF) was high (i.e. 11) for touch

deprivation and the interaction between touch deprivation and group membership, even after

centering touch deprivation. This could indicate a multicollinearity problem (Field, 2018).

However, As explained by Disatnik and Sivan (2014), the high VIF of the independent

variable and interaction term in this moderation model will most likely not create a

multicollinearity problem. Furthermore, the VIF of touch deprivation was reduced to an

**Table 1**

*Mean Scores and Standard Deviations of Patients and Controls on the LITPQ, RSES, CERQ, and IUS-12*

| Group | LITPQ | | RSES | | CERQ | | IUS-12 | |
|---|---|---|---|---|---|---|---|---|
| | *M* | *SD* | *M* | *SD* | *M* | *SD* | *M* | *SD* |
| Patients | 1.79 | .77 | 13.32 | 4.39 | 104.58 | 15.76 | 40.47 | 8.45 |
| Controls | 1.51 | .70 | 22.89 | 4.25 | 88.93 | 11.65 | 28.89 | 6.41 |

*Note.* LITPQ = Longing for Interpersonal Touch Picture Questionnaire, RSES = Rosenberg self-esteem scale, CERQ = Cognitive Emotion Regulation Questionnaire, IUS-12 = Intolerance of Uncertainty Scale - Short Form.

acceptable level (i.e. 1) when excluding the interaction term from the multicollinearity diagnostics. Therefore, the moderation analyses were carried out using PROCESS. Three moderation analyses were carried out to test the hypothesis that touch deprivation is predictive of a lower self-esteem, higher amount of emotion dysregulation, and higher intolerance of uncertainty, and to test the hypothesis that the relationship between touch deprivation is moderated by group membership (i.e. if the relationship between these transdiagnostic symptoms and touch deprivation is stronger in patients versus controls).

For self esteem, the overall model was significant, $R2 = .58$, $F(3, 43) = 20.02$, $p = <.001$. Group membership did not moderate the relationship between self-esteem and touch deprivation, since touch deprivation was not found to be a significant predictor of self-esteem , $b = -1.40$, $t(43) = -1.61$, $p = .115$ and since there was no interaction effect between touch deprivation and group membership on self-esteem  $b = .79$, $t(43) = .45$, $p = .653$. The hypotheses were therefore not supported by the results. Group membership was found to be a significant predictor of self esteem , $b = 9.15$, $t(43) = 7.08$, $p = <.001$. The scores of patients

on the RSES ($M = 13.32$, $SD = 4.39$) were lower than those of controls ($M = 22.89$, $SD = 4.25$.

For emotion dysregulation, the overall model was significant, $R2 = .27$, $F(3, 43) = 5.39$, $p = .003$. Group membership did not moderate the relationship between emotion dysregulation and touch deprivation, since touch deprivation was not found to be a significant predictor of emotion dysregulation, $b = 2.94$, $t(43) = 1.06$, $p = .294$ and since there was no interaction effect between touch deprivation and group membership on emotion dysregulation $b = -.062$, $t(43) = -.01$, $p = .991$. The hypotheses were therefore not supported by the results. Group membership was found to be a significant predictor of emotion dysregulation, $b = -14.83$, $t(43) = -3.60$, $p = <.001$. The scores of patients on the CERQ ($M = 104.58$, $SD = 15.76$) were higher than those of controls ($M = 88.93$, $SD = 11.65$).

For intolerance of uncertainty, the overall model was significant, $R2 = .43$, $F(3, 43) = 10.84$, $p = <.001$. Group membership did not moderate the relationship between intolerance of uncertainty and touch deprivation, since touch deprivation was not found to be a significant predictor of intolerance of uncertainty, $b = -1.13$, $t(43) = -.77$, $p = .446$ and since there was no interaction effect between touch deprivation and group membership on intolerance of uncertainty $b = 4.56$, $t(43) = 1.55$, $p = .129$. The hypotheses were therefore not supported by the results. Group membership was found to be a significant predictor of intolerance of uncertainty, $b = -12.14$, $t(43) = -5.56$, $p = <.001$. The scores of patients on the IUS-12 ($M = 40.47$, $SD = 8.45$) were higher than those of controls ($M = 28.89$, $SD = 6.41$).

## Discussion

Many people have experienced touch deprivation during the COVID-19 pandemic (Meijer et al., 2022). Touch deprivation is inversely related to psychological well-being: a higher amount of touch deprivation corresponds with a higher amount of anxiety (Field et al., 2020b; von Mohr et al., 2021), depression, and stress (Floyd, 2014). Notably, psychiatric

patients may be at a general greater risk to be touch deprived because of social isolation

(Elisha et al., 2006), but research on touch deprivation in psychiatric patients is scarce.

Therefore, the first goal of this study was to investigate if patients and controls differ in touch

deprivation. The second aim of this study is to investigate the possible effects of touch

deprivation in psychiatric patients. The hypothesis was that a higher amount of touch

deprivation would be predictive of a lower self-esteem, a higher intolerance of uncertainty,

and a higher amount of emotion dysregulation in both psychiatric patients and controls.

Furthermore, the relationship between touch deprivation and transdiagnostic symptoms was

expected to be stronger in the psychiatric patients compared to controls.

To assess touch deprivation, the LITPQ was used. No difference was found in the

amount of touch deprivation patients experienced versus controls. Both groups had a mean

score above 1, which indicates a presence of touch deprivation in both patients and controls.

A possible explanation is that due to the COVID-19 measures, healthy individuals

experienced a decrease in touching others (Field et al., 2020a; Meijer et al., 2022), while

patients did not, because they were already socially isolated to begin with (Elisha et al., 2006)

and thus may have already been touch deprived before COVID-19. In the current study,

84.21% of the patients experienced touch deprivation. Notably, before the COVID-19

pandemic, Beßler et al. (2020) found that 72.73% of healthy participants experienced touch

deprivation. The current study found that 89.29% of healthy participants experienced touch

deprivation, which may indeed indicate an increase in touch deprivation in healthy

participants during the COVID-19 pandemic. This is in line with the finding of Meijer et al.

(2022), who also found that over 80% of healthy participants felt touch deprived during

COVID-19. However, another possible explanation is that psychiatric patients do not

generally experience more touch deprivation than healthy individuals, since they do not

perceive touch as being pleasant (Croy et al., 2016; Löffler et al., 2022) and therefore may

have less need to be touched. Future studies could investigate if there is a difference in the amount of touch deprivation in patients versus controls when there are no social distancing measures, to explore if both patients and controls still experience touch deprivation when social distancing measures are lifted.

In order to assess self-esteem, the RSES was used. Touch deprivation was not predictive of the amount of self-esteem of participants in either patients or controls. It follows that group membership did not moderate the relationship between self-esteem and touch deprivation. This is not in line with the hypothesis, since previous research has found negative associations between touch deprivation and self-esteem (Boudreault & Ntetu, 2006; Copstead, 1980; Punyanunt-Carter & Wrench, 2009). A possible explanation for these contrasting results relates to the measure of touch deprivation used. To illustrate, Punyanunt-Carter & Wrench (2009) did find a negative association between touch deprivation and the RSES. However, the Touch Deprivation Scale (Punyanunt-Carter & Wrench, 2009) is only moderately correlated with the LITPQ, which may be because of differences in the definition and calculation of touch deprivation (Beßler et al., 2020). Namely, the LITPQ uses the categories "touch wish" and "touch frequency" to calculate touch deprivation, while the Touch Deprivation Scale uses the categories "absence of touch", "touch longing" and "touch for sex". An advantage of the LITPQ is its use of pictures, which may be useful for individuals with reading comprehension problems or to cross language barriers (Beßler et al., 2020). The Touch Deprivation Scale does not have this advantage. A disadvantage of the LITPQ is that individuals may find it difficult to estimate their touch frequency (Beßler et al., 2020), which is not an issue in the Touch Deprivation Scale. However, disadvantages of the Touch Deprivation Scale are that it does not consider different touch partners and that it does not look at touch deprivation during a specific period, while the LITPQ does. Thus, the

contrasting results between previous research and the current study may be because of the questionnaires used.

In order to assess emotion dysregulation, the CERQ was used. Touch deprivation was not predictive of the amount of emotion dysregulation participants experienced in either patients or controls. It follows that group membership did not moderate the relationship between emotion dysregulation and touch deprivation. This is not in line with the hypothesis, since previous research found that touch seems to be of importance for emotion regulation. For instance, it has been found that social touch has positive effects on affect (Debrot et al., 2013) and attenuates responses to threat (Coan et al., 2006) and social stressors (von Mohr et al., 2017). A possible explanation for the absence of the expected results could be related to the fact that emotion (dys)regulation is a multidimensional construct of which not every aspect can be captured in a self-report questionnaire that only measures general strategy selection (Bettis et al., 2022). Thus, it is possible that a different process than emotion strategy selection underlies the relationship between touch (deprivation) and emotion dysregulation. For example, Debrot et al. (2013), who, as above-mentioned, found that social touch has positive effects on affect, used an e-diary over the course of a week to measure affect. This means they looked at a different aspect of emotion regulation, namely emotion regulation processes that are sensitive to a certain context (Bettis et al., 2022). Specifically, they found that social touch is associated with differences in momentary affect (Debrot et al., 2013), which is in line with the research conducted by Coan et al. (2006) and van Mohr et al. (2017). Namely, Coan et al. (2006) and van Mohr et al. (2017) also found that social touch has an emotion regulatory function right after being touched. Thus, while the CERQ measures the explicit and cognitive emotion regulation strategies people generally tend to select (Garnefski et al., 2001), the emotion regulatory function of touch may be more related to the flexible implementation of strategies related to the context of a situation. Thus, future

research could investigate if emotion regulation processes other than general, cognitive strategy selection are related to touch deprivation in psychiatric patients.

In order to assess intolerance of uncertainty, the IUS-12 was used. Touch deprivation was not predictive of the amount of intolerance of uncertainty participants experienced in either patients or controls.  It follows that group membership did not moderate the relationship between intolerance of uncertainty and touch deprivation. This is not in line with the hypothesis, since seeking soft, haptic experiences was found to be useful in decreasing the intolerance of uncertainty of individuals (van Horen & Mussweiler, 2014). It was speculated that the reverse may also be true (i.e. the absence of seeking haptic experiences may result in an increase of intolerance of uncertainty). However, this may not be the case. Furthermore, interpersonal touch was not used in the study of van Horen & Mussweiler (2014): the haptic experiences consisted of objects such as holding a soft pen. On the one hand, it could be possible that these soft, haptic experiences do not extend to social touch. On the other hand, this seems unlikely, since it is thought that people find soft, haptic experiences pleasant because it reminds them of interpersonal touch (Pasqualotto, 2020). More research is needed to investigate the relationship between intolerance of uncertainty, interpersonal touch, and touch deprivation.

Even though touch deprivation was not predictive of self-esteem, emotion dysregulation, or intolerance of uncertainty, group membership did predict these transdiagnostic symptoms. Namely, being in the patient group was predictive of a lower self-esteem, a higher intolerance of uncertainty, and more emotion dysregulation. This is in line with previous findings showing an increase in these transdiagnostic symptoms in psychiatric patients (Carleton, 2016; Fitzgerald et al., 2018; Kresznerits et al., 2022).

A limitation of the current study is the sample size. Namely, the sample size of this study may have been too small in order to detect any effects. Using G*Power (Erdfelder et

al., 2007) it was found that a sample size of 395 participants is needed in order to find a small effect. Thus, it is plausible the current total sample size of 47 did not have enough power to find a significant result.

## Conclusion

To conclude, the first aim of this study was to investigate if there is a difference in the amount of touch deprivation patients versus controls experienced. The second aim of this study was to investigate if the amount of touch deprivation is predictive of transdiagnostic symptoms in psychiatric patients and controls. It was found that patients and controls did not differ in the amount of touch deprivation they experienced. Furthermore, it was found that touch deprivation was not predictive of self-esteem, emotion dysregulation, or intolerance of uncertainty. So, group membership did not moderate the relationship between transdiagnostic symptoms and touch deprivation. Thus, the hypotheses were not supported by the results. This could be because of methodological differences, like the questionnaires used, or because of theoretical differences, such as different emotion regulation processes. Research on touch deprivation in psychiatric patients is scarce. Thus, implications for future research were formulated. The current study provided the important insight that during the COVID-19 pandemic, patients and controls did not differ in touch deprivation, meaning patients were not doing worse during social distancing measures compared to healthy individuals in this regard. Still, research on the topic of touch, touch deprivation and symptomatology is important to broaden our knowledge of the role of touch in relation to psychiatric symptoms, which may hold a place in future treatments.

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