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ORIGINAL ARTICLE

Emotion Regulation as a Transdiagnostic Risk Factor for (Non)Clinical Adolescents' Internalizing and Externalizing Psychopathology: Investigating the Intervening Role of Psychological Need Experiences

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Abstract
This study investigated emotion regulation (i.e., emotional integration, suppression and dysregulation) as a transdiagnostic process underlying adolescents' internalizing and externalizing symptoms. Basic psychological need experiences were investigated as a possible underlying mechanism explaining this association. A heterogeneous sample of non-clinical and clinically-referred adolescents reported upon emotion regulation, basic psychological needs (i.e., need satisfaction and frustration), and both internalizing and externalizing problems. Results indicated that dysfunctional emotion regulation was positively linked to internalizing as well as externalizing problems. Need frustration was a partial mediator in this relation between emotion regulation and psychopathology. The findings suggest that both emotion regulation and basic psychological needs may play a transdiagnostic role in adolescents' internalizing and externalizing symptoms.

Keywords Emotion regulation · Basic Psychological Needs · Self-Determination Theory · Psychological well-being · Adolescence

Introduction

There is growing evidence for the presence of one general psychopathology factor (i.e., the p-factor) underlying both adolescents' and adults' psychiatric disorders [1, 2]. The rising consensus on this p-factor challenges the field to rethink evidence-based treatment programs that are now mainly disorder-based protocols [3], and to develop interventions that target transdiagnostic processes. Insight in such processes may help clinicians to increase the efficiency of treatment by moving interventions from the manifest and often changing phenotypical or symptom level towards a more fundamental level of psychopathology [4]. Although still a nascent field of inquiry, research has begun to focus on emotion regulation as a transdiagnostic factor in the development of internalizing and externalizing psychopathology [5]. The present study aims to build on this research by investigating the link between emotion regulation and psychopathology from the perspective of Self-Determination Theory (SDT [6, 7]). This perspective allows for an examination of intervening processes that explain why some emotion regulation strategies are more adaptive than others. According to SDT, the adaptive or more maladaptive nature of emotion regulation is largely determined by its effect on a person's basic psychological need experiences.

The Transdiagnostic Role of Emotion Regulation

Emotion regulation concerns the various (un)conscious adaptive and maladaptive processes through which individuals regulate their emotions [8]. Within SDT, three different emotion regulation styles have been discerned [9]. Emotional integration, which is considered the most adaptive emotion regulation style in SDT, is characterized by an openness and receptivity for one's emotional states such that emotions are brought to full awareness [10]. Due to this high awareness and accompanying accepting stance towards felt emotions, individuals can use their emotions in

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an informational way, with emotions serving as a guide for subsequent volitional action. Previous research with adolescents showed that emotional integration is related to better mental health [11–16].[1]

In contrast, emotional suppression and dysregulation are considered two more suboptimal emotion regulation styles. Suppressive regulation involves the minimization or avoidance of the experience and/or expression of negative emotions. Dysregulation involves experiencing emotions but not having the capacity to down-regulate these emotions. Both suppression and dysregulation have been found to relate positively to adolescents' internalizing and externalizing symptoms [e.g., 11, 17–20]. According to SDT, the adaptive or maladaptive nature of emotion regulation strategies can be understood through the interplay of these strategies with experiences of psychological need satisfaction or need frustration.

Basic Psychological Need Experiences

SDT identifies three basic psychological needs as universal and essential ingredients for a healthy psychological development [6, 21]: the needs for autonomy (which involves the experience of personal choice and volition in one's actions), competence (which refers to the experience of effectiveness when interacting with one's environment) and relatedness (which involves the experience of intimacy and reciprocal care for each other). While satisfaction of these three needs is assumed to contribute to well-being and better social adjustment, the frustration of these needs would render individuals vulnerable to ill-being and maladjustment [7]. Within SDT, it is argued that need frustration has a direct emotional cost (which may manifest in internalizing distress), but may also elicit compensatory attempts to restore thwarted needs [22]. Such compensatory attempts include a loss of self-control and rebellious behavior, possibly resulting in externalizing problems. Research indeed confirmed that need satisfaction relates to higher psychological well-being [e.g., 21, 23] whereas need frustration relates to various indicators of psychological distress [6, 24, 25]. Further, two recent studies supported the transdiagnostic value of need frustration when investigating the co-occurrence of internalizing symptoms and eating disorder symptoms [26, 27].

Emotion Regulation and Basic Psychological Need Experiences

On the basis of SDT, it can be expected that individuals' quality of emotion regulation is related to each of the three basic psychological needs. When using integrative emotion regulation, adolescents stay true to themselves even in difficult and emotionally charged circumstances (i.e., autonomy), they make full use of the informational value of their emotions, which enables them to deal constructively with emotionally salient situations (i.e., competence), and they communicate about emotions more openly to close others, which is likely to elicit appropriate social support from others (i.e., relatedness). In contrast, the use of more maladaptive emotion regulation strategies (i.e., dysregulation and suppression) would relate to more need frustration. Specifically, maladaptive emotion regulation is likely to frustrate adolescents' need for autonomy because they would feel compelled to hide emotions (in case of suppression) or because they would feel like their emotions are making them do things they would not choose to do (in case of dysregulation). Because suppressive regulation, and dysregulation even more so, would make adolescents feel inadequate in regulating emotions, adolescents using these strategies are likely to doubt their capacities to deal effectively with challenging situations (i.e., competence frustration). Finally, these emotion regulation strategies likely come with an interpersonal cost because the secrecy associated with suppressive regulation hampers open communication with others and because the hyperactivation of emotions associated with dysregulation may push others away (i.e., relatedness frustration). Different emotion regulation strategies would thus relate differently to adolescents' need-based experiences, with these experiences in turn relating to adolescents' risk for psychopathology. A recent study by Benita et al. [14] provided initial evidence for this sequence of events, showing that need satisfaction mediated the relationship between integrative emotion regulation and well-being and that need frustration mediated the relationship between suppression and low well-being. Emotional dysregulation was not investigated in this study.

[1] One construct strongly linked to integrative emotion regulation is mindfulness (see Roth, Vansteenkiste & Ryan, 2019 for more information on the link between emotional integration and other conceptual frameworks). Mindfulness is defined as nonjudgmental awareness of one's present moment experiences (Chambers, Gullone, & Allen, 2009). Although integrative emotion regulation and mindfulness are overlapping with regard to the component of receptive awareness (Deci, Ryan, Schultz, & Niemiec, 2015), integrative emotion regulation goes beyond the factor of observing and also involves active interest taking in one's inner emotional world, with the aim of coordinating these emotional experiences with other aspects of the self (i.e., needs, values, and aspirations) and the situational circumstances (Schultz & Ryan, 2015), using the resulting understanding to regulate the expression or withholding of emotions in a more volitional way.

The Present Study

The first aim of the present study is to explore whether different emotion regulation strategies (i.e., emotional integration, suppression and dysregulation) relate differentially to adolescents' internalizing and externalizing symptoms in a heterogeneous sample of both referred and non-referred participants. We predict that integrative emotion regulation will relate negatively to both types of problems and that suppression and dysregulation will relate positively to these problems. If emotion regulation functions as a transdiagnostic risk factor for both internalizing and externalizing psychopathology, it should account (at least partially) for the co-occurrence between internalizing and externalizing symptoms [28]. In other words, associations between adolescents' internalizing and externalizing problems would be reduced when entering emotion regulation strategies as predictors of both types of psychopathology [26].

Second, the present study examines need-based experiences as a possible underlying mechanism in the link between emotion regulation and psychopathology. Need-based experiences are expected to mediate associations between emotion regulation and psychopathology. Another more exploratory hypothesis, which is not mutually exclusive with the possibility of mediation, is that emotion regulation and need-based experiences interact in the prediction of adolescent psychopathology. Specifically, we explored whether emotion regulation could strengthen or attenuate associations between need-based experiences and psychopathology. Previous studies examining the role of emotion regulation as a moderator indeed found that emotion regulation could be a protective factor preventing risk factors (e.g., stress) from translating into symptoms of psychopathology (e.g. [29]). In testing the mediation and moderation models, the role of clinical status will be investigated to examine whether findings generalize across referred and non-referred adolescents. More specifically, we will address the question whether emotion regulation and basic psychological needs are related to both sub-threshold (non-clinical) symptoms as well as to clinically elevated problems, hence examining whether our constructs of interest tap into the dimensional nature of psychopathology.

Method

Procedure

Participants included both referred and non-referred adolescents. The referred group of adolescents ($N = 84$) was recruited via the Child and Youth psychiatric ward at the Ghent University hospital and the Psychiatric Center Karus. All inpatients, aged between 12 and 18, who applied for residential treatment were invited by their psychologist to participate in the study. Patients were informed that completed questionnaires could be included in their treatment plan. Of all contacted participants, 91% agreed to take part. The non-referred group of participants consisted of students contacted via a secondary school in Flanders-Belgium, of which 89% agreed to take part. No compensations were foreseen for any of the participants in the referred or non-referred sample. However, extra efforts were made to motivate the adolescents to participate (e.g., by providing a rationale for participation and by sending several reminders). To match the referred and non-referred sample according to adolescents' gender, age, education level and family structure, a subgroup of 84 non-referred adolescents was selected from the initial sample ($N = 156$).

Both adolescents and their parents received information about the objectives and procedure of the study. Parents were asked to provide active informed consent and adolescents were asked to assent to participate. The survey, organized in the clinic or in a school setting, took approximately 1 h. Adolescents' questionnaires were administered by trained clinical psychology students or trained psychologists. The Ethical Committees of Ghent University and the Ghent University Hospital approved the protocol of this study (protocol number EC UZG 2015/0010).

Participants

Information on the demographics and clinical status of the referred ($N = 84$) and non-referred ($N = 84$) sample is provided in Table 1. The referred and non-referred sample did not show significant differences on the matching criteria ($F(1, 166) = 0.03$, $p > .05$, $F(1, 166) = 3.61$, $p > .05$, $F(1, 166) = 3.08$, $p > .05$ and $F(1, 166) = 1.93$, $p > .05$ for respectively gender, age, education level, and family structure).

Measures

Emotion Regulation Emotion regulation styles were assessed using the Emotion Regulation Inventory (ERI) developed by Roth et al. [30]**.** All items were rated with regard to the regulation of sadness. The ERI has three subscales: integration (6 items, e.g., "Feelings of sadness can sometimes help me understand important things about myself"), suppression (6 items, e.g., "When I feel sad, I almost always hide it so others won't notice it"), and dysregulation (6 items, e.g., "Often my sadness makes me behave in ways I do not feel good about or agree with"). All items were rated on a scale from 1 (*completely disagree*) to 5 (*completely agree*). Previous research has provided evidence for the internal structure and validity of this instrument (see e.g. [11, 17, 30]. In the current study, Cronbach's alphas for

Table 1 Demographics and clinical information on the referred and non-referred sample

		Referred group ($N = 84$)	Non-referred group ($N = 84$)
Demographics	Gender	63 girls, 21 boys	62 girls, 22 boys
	Age	12–18 ($M = 15.68$, $SD = 1.43$)	12–18 ($M = 16.14$, $SD = 1.72$)
Level of education	Academic track	38.1%	45.2%
	Technical track	61.9%	54.8%
Family structure	Intact families	46.4%	57.1%
	Non-intact families	53.6%	42.9%
Living situation adolescent	With both parents	53.5%	66.3%
	With one of the parents	22.1%	18.6%
	With one of the parents and a new partner	16.3%	15.1%
	In a foster or adoptive family	4.7%	0%
	In a family replacement home	2.3%	0%
	alone	1.2%	0%
History of psychological support	Participants who received psychological help in the past (yes/no question)	85.7%	17.4%
Current psychological support	No psychological treatment at this moment	0%	97.7%
	Out-patient psychological treatment	11.4%	2.3%
	In-patient observation	35.7%	0%
	In-patient treatment (day admission)	12.9%	0%
	In-patient treatment (fulltime admission)	40%	0%
DSM-oriented scales	Scoring within the clinical range	Boys/girls	Boys/girls
	Affective problems	52.6% / 64.6%	18.2% / 9.4%
	Anxiety problems	31.6% / 55.4%	9.1% / 4.7%
	Somatic problems	50% / 23.4%	9.1% / 4.7%
	Attention deficit/hyperactivity problems	10.6% / 16.9%	13.6% / 1.6%
	Oppositional defiant problems	21.1% /4.6%	4.5%/ 1.6%
	Conduct problems	26.3% /9.2%	4.5%/ 0.0%

Note. The DSM-oriented scales were calculated using the Manual for the ASEBA School-Age Forms & Profiles (Youth Self-Report)

integration, suppression and dysregulation were satisfying, with coefficients of respectively .72, .76 and .77.

Basic Psychological Needs To capture satisfaction and frustration of adolescents' basic psychological needs, we administered the Basic Psychological Needs Scale (BPNS [21]). All adolescents filled out the full 24-item version, with 12 items tapping into need satisfaction (e.g., "I feel a sense of choice and freedom in the things I undertake", for autonomy satisfaction), and 12 items tapping into need frustration (e.g., "I have serious doubts about whether I can do things well", for competence frustration). All items are rated on a 5-point scale, ranging from 1 (*Strongly Disagree*) to 5 (*Strongly Agree*). Each 12-item scale has four items tapping into autonomy, four items tapping into competence and four items tapping into relatedness. For each individual, a total need satisfaction and a total need frustration score was calculated by taking the means of the 12 need satisfaction and the 12 need frustration scores, respectively. Chen et al. [21] provided evidence for the psychometric properties of the BPNS. In the current study, Cronbach's alpha coefficients were adequate with .91 for need satisfaction and .92 for need frustration.

Adolescents' Internalizing and Externalizing Symptoms The Youth Self Report (YSR [31]) was administered as a measure of adolescents' emotional and behavioural problems. The YSR includes 31 internalizing items and 32 externalizing items. Cronbach alphas in the present study were .95 and .88 for the YSR internalizing and externalizing problem scale, respectively.

Treatment of Missing Values

To maximize sample size in the referred and non-referred sample, cases with missing values were included in the analyses by estimating missing data. Participants with and without complete data were compared using Little's Missing Completely At Random (MCAR [32]) test. A χ^2/df ratio value of 2 or less suggests that missing values can be estimated reliably. The χ^2/df ratio in this study was 0.57, suggesting that the data were missing completely at random.

Table 2 Means, standard deviations, and correlations among study variables

	1	2	3	4	5	6	7
1. Dysregulation	–						
2. Suppression	−.21**	–					
3. Integration	.02	**−.41*****	–				
4. Need satisfaction	**−.38*****	−.22**	**.38*****	–			
5. Need frustration	**.47*****	.19**	**−.24****	**−.82*****	–		
6. Internalizing problems	**.49*****	.09	−.23**	**−.72*****	**.81*****	–	
7. Externalizing problems	**.38*****	.16*	−.20**	**−.26*****	**.41*****	**.42*****	–
M	2.95	3.27	3.17	3.33	2.74	23.82	12.49
SD	0.82	0.78	0.67	0.80	0.91	14.54	8.65

Note. * $p < .05$. ** $p < .01$. *** $p < .001$. Correlations that remain statistically significant after Bonferroni correction appear in bold-face type

Table 3 Means by gender and clinical status

	Female *M* (*SD*)	Male *M* (*SD*)	*F*-value	Partial Eta Squared	Non-referred *M* (*SD*)	Referred *M* (*SD*)	*F*-value	Partial Eta Squared
Dysregulation	3.00 (0.77)	2.82 (0.96)	1.44	.01	2.67 (0.80)	3.23 (0.75)	22.11***	.12
Suppression	3.25 (0.78)	3.34 (0.80)	0.45	.00	3.29 (0.75)	3.26 (0.81)	0.04	.00
Integration	3.15 (0.65)	3.24 (0.72)	0.55	.00	3.26 (0.63)	3.08 (0.70)	3.20†	.02
Need satisfaction	3.21 (0.79)	3.67 (0.75)	11.10***	.06	3.70 (0.56)	2.96 (0.84)	43.79***	.21
Need frustration	2.79 (0.90)	2.58 (0.92)	1.71	.01	2.28 (0.67)	3.19 (0.88)	56.23***	.25
Internalizing problems	25.54 (14.87)	18.45 (12.13)	7.50**	.04	14.36 (9.05)	33.64 (12.53)	129.19***	.44
Externalizing problems	11.80 (8.05)	14.59 (10.09)	3.25†	.02	9.64 (6.83)	15.40 (9.36)	20.59***	.11

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

Therefore, missing data were estimated using Full Information Maximum Likelihood (FIML) in MPlus and all structural analyses were performed on the total sample of 168 participants.

Results

Descriptive Statistics and Preliminary Analyses

Table 2 presents correlations between all study variables. Dysregulation was related positively to both internalizing and externalizing problems, whereas integrative regulation was related negatively to both types of problem behavior. Emotional suppression was related positively to adolescents' externalizing problems, whereas no significant correlation was found with internalizing problems. Further, need satisfaction was related negatively to adolescents' internalizing and externalizing symptoms, whereas an opposite pattern was observed for need frustration. Dysregulation and suppression also showed a negative association with need satisfaction, whereas a positive association was found between these two regulation strategies and need frustration. The opposite pattern of associations was found for integrative regulation. Because similar correlation patterns were found for each of the three needs with both need satisfaction and frustration (see Appendix), and also for reasons of parsimony, all further analyses relied on the composite scores for need satisfaction and need frustration.[2]

Next, differences in the study variables in terms of adolescents' age, gender, type of education, family structure, and clinical status (referred versus non-referred sample) were examined through a multivariate analysis of variance. This MANOVA revealed a significant multivariate effect of gender and clinical status on the study variables (Wilks' Lambda respectively $F(7, 139) = 2.11$, $p < .05$ and $F(7, 139) = 8.53$, $p < .001$, respectively). Table 3 shows the means and standard deviations of all the study variables by adolescents' gender and clinical status. Boys reported more need satisfaction than girls [$F(1, 165) = 11.102$, $p < .001$], and girls reported more internalizing problems than boys [$F(1, 163) = 7.50$, $p < .01$]. Further, adolescents in the referred group reported more dysregulation [$F(1, 166) = 22.11$,

[2] The three needs of autonomy, competence and relatedness, were also substantially intercorrelated. This finding is theoretically plausible because the three needs are assumed to affect one another

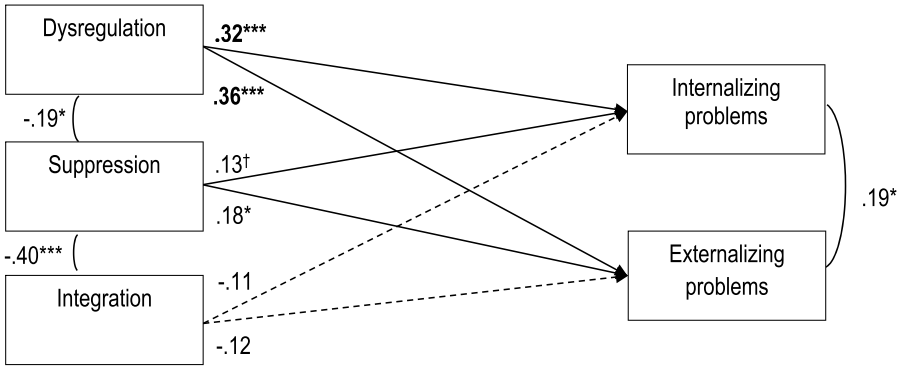

Fig. 1 Structural model of the associations between emotion regulation styles and adolescents' psychological problems. Coefficients are standardized path coefficients. For reasons of parsimony, effects of gender and clinical status are not shown
Note: † $p < .10$. * $p < .05$. ** $p < .01$. *** $p < .001$. Path coefficients that remain statistically significant after Bonferroni correction appear in bold-face type.

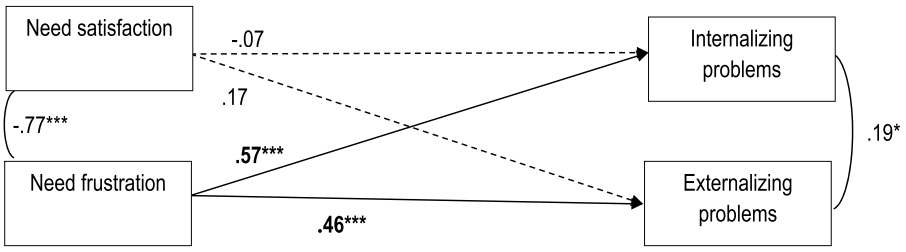

Fig. 2 Structural model of the associations between psychological need experiences and adolescents' psychological problems. Coefficients are standardized path coefficients. For reasons of parsimony, only significant associations are displayed, and effects of gender and clinical status are not shown
Note: * p < .05. ** p < .01. *** $p < .001$. Path coefficients that remain statistically significant after Bonferroni correction appear in bold-face type.

$p < .001$], less need satisfaction and more need frustration [$F(1, 165) = 43.79$, $p < .001$ and $F(1, 165) = 56.23$, $p < .001$, respectively], more internalizing and externalizing symptoms [$F(1, 163) = 129.19$, $p < .001$ and $F(1, 164) = 20.59$, $p < .001$, respectively] compared to adolescents in the non-referred group. The effects of age, educational level and family structure were not significant, and neither were the two-way interactions between the background variables. Given the significant associations of the background variables (gender and clinical status), we controlled for the effects of these variables in all main analyses.

Structural Equation Modeling (SEM)

Direct Effects Model We ran a SEM model including the associations between emotion regulation and both internalizing and externalizing symptoms. This model was tested in MPlus, version 7 [33]. We started by testing a fully saturated model allowing correlations between all three emotion regulation strategies and between internalizing and externalizing symptoms, whereas in a next step we left out all non-significant pathways. The model (see Fig. 1) fitted the data well, $\chi^2(5) = 3.47$, CFI = 1.00, RMSEA = .00, SRMR = .03. A positive association was found between dysregulation and both internalizing and externalizing problems. Further, a positive association was found between suppression and externalizing symptoms, whereas a marginally significant positive association was found with internalizing symptoms. The association between integration and both types of psychopathology was negative yet non-significant. Finally, the correlation between internalizing and externalizing symptoms decreased (from $r = .42$, $p < .001$ to $r = .19$, $p < .05$) when adding emotion regulation to the model.

Mediating Model Before entering need-based experiences as a mediator variable, we investigated the link between need satisfaction, need frustration and both internalizing and externalizing symptoms (see Fig. 2). This model fitted the data well, $\chi^2(1) = 1.42$, CFI = 1.00, RMSEA = .05, SRMR = .03. A positive association was found between need frustration and both internalizing and externalizing problems, whereas the association between need satisfaction and both symptoms was non-significant. As both integrative emotion regulation and need satisfaction were unrelated to both internalizing and externalizing symptoms, we investigated need frustration as a mediating variable in the relation between dysfunctional emotion regulation and both internalizing and externalizing symptoms. A full mediation model was estimated ($\chi^2(9) = 21.72$, CFI = .96, RMSEA = .09, SRMR = .05), followed by a partial mediation model adding direct paths between emotion regulation and both symptoms ($\chi^2(5) = 5.89$, CFI = 1.00; RMSEA = .03; SRMR = .03). The

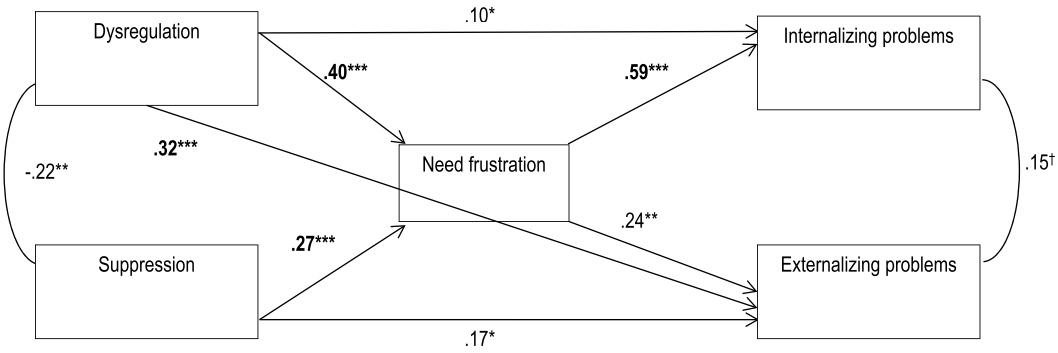

Fig. 3 Final structural mediation model. Coefficients are standardized path coefficients. For reasons of parsimony, only significant association are displayed, and effects of gender and clinical status are not shown

Note: † $p < .10$. * $p < .05$. ** $p < .01$. *** $p < .001$. Path coefficients that remain statistically significant after Bonferroni correction appear in bold-face type.

partial mediation model had a significantly better fit than the full mediation model, $\Delta\chi^2(4) = 15.83$, $p < .01$, and is displayed in Fig. 3. This model showed that (a) need frustration related to both internalizing and externalizing symptoms, (b) need frustration partially mediated the relation between dysregulation and both internalizing and externalizing symptoms, partially mediated the relationship between suppression and externalizing symptoms, and fully accounted for the relation between suppression and internalizing symptoms, and (c) the correlation between internalizing and externalizing symptoms was further reduced to non-significance ($\beta = .15$, $p > .05$). All indirect associations, tested via delta method [34], were significant ($\beta = .24$, $p < .001$ and $\beta = .09$, $p < .01$ for the indirect association between dysregulation and respectively internalizing and externalizing problems via need frustration; $\beta = .16$, $p < .001$ and $\beta = .07$, $p < .05$ for the indirect association between suppression and respectively internalizing and externalizing problems via need frustration).

Moderating Model In a next step, we tested interactions between the emotion regulation styles (dysregulation, suppression, integration) and the psychological need experiences (need satisfaction and need frustration), resulting in six possible interactions for internalizing symptoms and six possible interactions for externalizing symptoms (see Table 4). To do so, we estimated SEM models with interaction terms. With regard to externalizing problems, there were significant direct effects of dysregulation and need frustration but no significant interactions emerged. With regard to internalizing problems, there were significant direct effects of dysregulation, need satisfaction and need frustration, and two significant interactions appeared, that is between integration and need frustration and between integration and need satisfaction. These two significant interactions are displayed graphically in Fig. 4 and show that emotional integration attenuates the association between need-based experiences and internalizing problems. Specifically, simple slopes revealed that all slopes were significant, but the positive association between levels of need frustration and internalizing problems is stronger for participants scoring low on emotional integration ($b = 10.75$ (*0.87*), $p < .001$) followed by participants scoring on average ($b = 9.64$ (*0.74*), $p < .001$) and scoring high on emotional integration ($b = 8.53$ (*0.96*), $p < .001$). Similarly, the negative association between need satisfaction and internalizing problems is

Table 4 Interactions between emotion regulation and need-based experiences

	Internalizing symptoms	Externalizing symptoms
Dysregulation	.18**	.29***
NS	−.45***	−.12
Dysregulation * NS	−.03	.02
Dysregulation	.10*	.23**
NF	.58***	.25*
Dysregulation * NF	.04	−.02
Suppression	−.00	.12†
NS	−.52***	−.15
Suppression * NS	−.08†	−.01
Suppression	−.01	.10
NF	.62***	.31**
Suppression * NF	.05	.07
Integration	.02	−.13†
NS	−.51***	−.14
Integration * NS	.10*	−.04
Integration	−.03	−.11
NF	.61***	.32**
Integration * NF	−.08*	.08

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

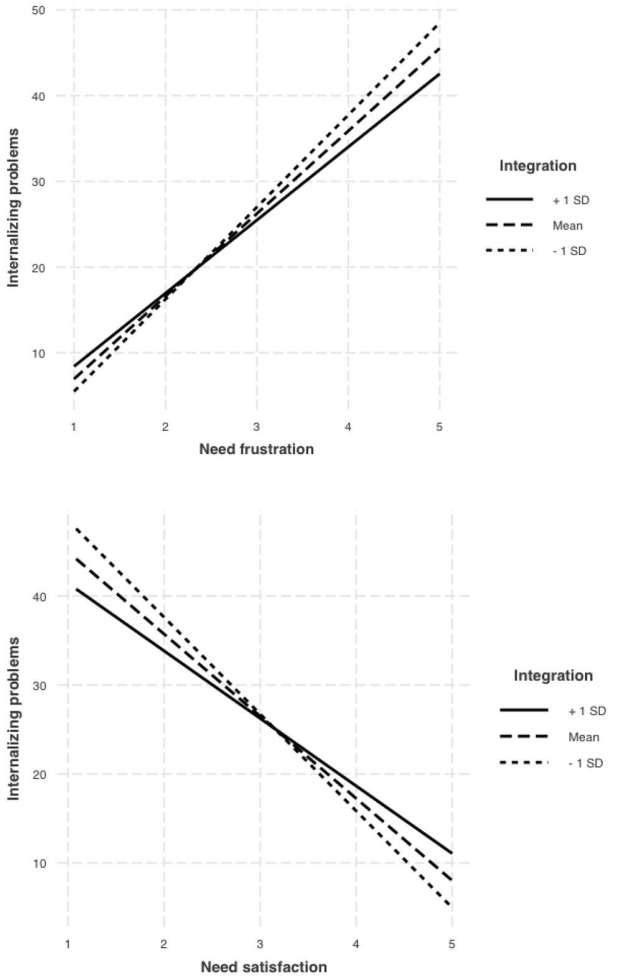

Fig. 4 Two-way interaction plot with need frustration and satisfaction respectively as independent variables, emotional integration as a moderator, and internalizing problems as a dependent variable

stronger for participants scoring low on emotional integration ($b = -10.88$ (*1.25*), $p < .001$) followed by participants scoring on average ($b = -9.23$ (*1.03*), $p < .001$) and scoring high on emotional integration ($b = -7.59$ (*1.30*), $p < .001$). Although only two out of 12 tested interactions turned out to be significant, the shape of the two interactions obtained is in line with expectations.

The (Moderating) Role of Clinical Status To examine whether clinical status could function as a moderator variable in both the mediator and moderator sequence, multigroup analysis was conducted comparing constrained models (in which the modeled pathways were set to be invariant across groups) with unconstrained models (in which these parameters were freely estimated across groups). With regard to the final structural mediation model (see Fig. 3), no significant differences were found between the models ($\Delta SBS\text{-}\chi^2(7) = 6.31$, $p > .05$). With regard to the moderator models, no significant differences were found between the models (all ps > .05) with the exception of one significant interaction, that is, the interaction between integration and need frustration on internalizing problems ($\beta = .09$, $p < .05$). While emotional integration was found to buffer the effect of need frustration on internalizing problems in the non-clinical group, this was not the case in the clinical group (see Fig. 5).

Discussion

The field of psychopathology increasingly aims to identify transdiagnostic instead of disorder-specific processes [1]. One construct that has gained an impressive amount of attention from this transdiagnostic viewpoint is emotion regulation [5]. Based on Self-Determination theory, this study tested the assumption that need-based experiences may function as an important underlying mechanism in the link between emotion regulation and different types of psychopathology [22].

Results showed that dysregulated emotion regulation is linked positively to both internalizing and externalizing problems. Associations of emotional suppression with these problems were less pronounced, with only the association with externalizing problems reaching significance. One possible explanation for the less pronounced results regarding emotional suppression is that this strategy may have some short-term adaptive value (i.e., not being overwhelmed by negative emotions). Yet, in the longer run suppression may be disabling because of its relatively controlling character (i.e., adolescents feel pressured to alter, downplay, or even dismiss their negative emotions [22]). Further longitudinal research, in a larger sample, is needed to investigate this possibility. Importantly, the correlation between internalizing and externalizing problems decreased after including emotion regulation strategies as transdiagnostic predictors. These findings indicate that the vulnerability for developing either internalizing or externalizing problems can be partially understood from similar deficits in emotion regulation. Further, results showed that basic psychological need frustration was linked positively to both internalizing and externalizing problems, whereas psychological need satisfaction did not have any unique association with the problem behaviors. These findings are in line with previous studies [7, 35] pointing to the specific importance of need frustration in relation to psychopathology. Moreover, the present study demonstrates that the correlation between internalizing and externalizing problems decreased further after including need frustration as a predictor, indicating that need frustration represents an additional (and more proximal) transdiagnostic factor in adolescents' psychopathology.

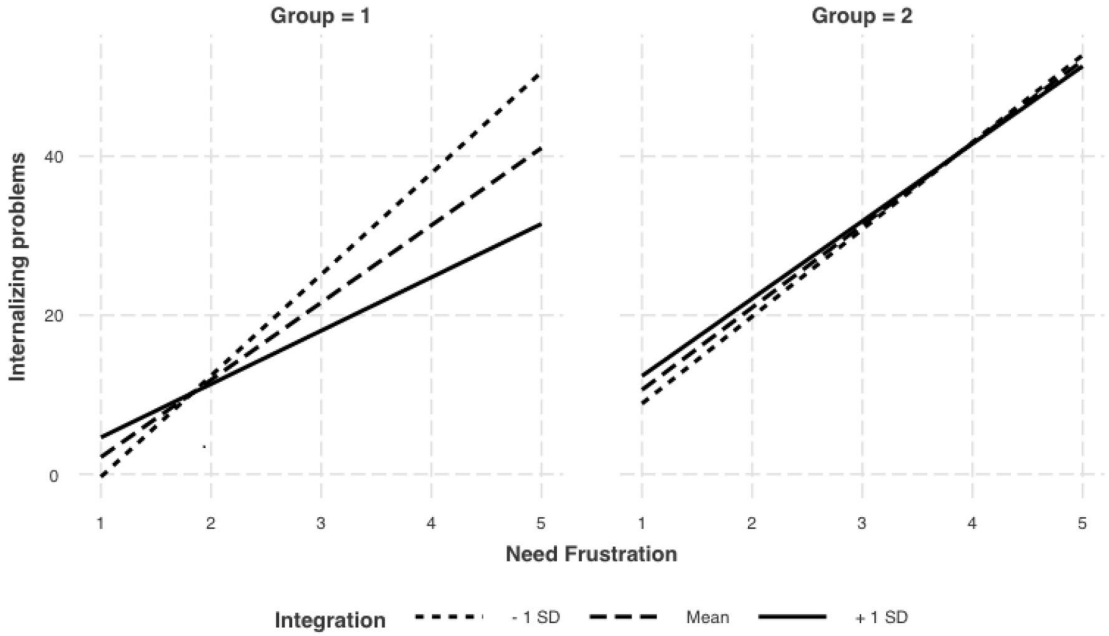

Fig. 5 Three-way interaction plot with need frustration as independent variable, emotional integration and clinical status as moderator variables and internalizing problems as dependent variable

Consistent with our mediation hypothesis, the findings suggest that need frustration may represent a (transdiagnostic) mechanism that helps to explain the link between emotion regulation and different manifestations of psychopathology (see also [14]). Nonetheless, as need frustration did not fully explain the link between emotion regulation and psychopathology, other explanatory processes (such as adolescents' experienced tension and stress) may additionally serve as a possible underlying mechanism. In contrast to dysregulation and suppression, integration did not have a direct and unique effect on psychopathology. Possibly, this lack of a unique effect is due to the inclusion of only problematic outcomes in the current study. Future research may include positive developmental outcomes, and investigate whether integrative emotion regulation is linked to higher wellbeing through need satisfaction. Further, although emotional integration did not show a direct association with psychopathology, it did play a buffering role. Apparently, emotional integration helps adolescents to cope better with the negative emotions following from low need satisfaction and high need frustration, such that adolescents are armed better against the emotional cost associated with such experiences. Because the current study is the first to demonstrate this protective role of integrative emotion regulation, it is important to replicate the current findings.

An important asset of the current study is that the sample consisted of both non-clinical and clinically-referred adolescents. This feature of the study allowed us to examine mean-level differences. In line with previous research, clinical participants were more inclined to report high emotional dysregulation [36], less need satisfaction and more need frustration. Although the latter finding was theoretically expected [7], no study to date directly compared a clinically referred and non-referred subgroup with regard to their basic psychological needs. An important question for future research in this regard is whether clinical youngsters' problems with emotion regulation and basic psychological needs are temporary in nature (for example, the problem recedes after youngsters followed successful therapy), or whether these problems are deeper, more fundamental risk factors that young people continue to carry after they have recovered.

The heterogeneous nature of the sample also allowed for a test of the generalization of our findings across adolescents' clinical status. As the mediational link was similar across the two groups, our findings support the notion that emotion regulation and need-based experiences represent fundamental processes that are relevant across a broad spectrum of moderate to severe problems [21, 37]. The moderating role of integrative emotion regulation did seem to differ somewhat between the referred and non-referred adolescents. As the buffering role of emotional integration was only significant in the non-clinical group, this finding may suggest that there are limits to the extent to which emotion regulation can protect against the negative consequences associated with need frustration. Because this study is the first to demonstrate this complex interaction between clinical status,

emotion regulation, and psychological need frustration, future research is needed to replicate this finding.

Limitations and Directions for Future Research

Due to the cross-sectional design of the current study, a first important direction for future research is to examine the associations between emotion regulation, the needs and psychopathology longitudinally. Based on SDT and previous research, emotion regulation is assumed to not only give rise to need-based experiences but to also be rooted in individuals' developmental history of need-based experiences. Specifically, early need-supportive experiences such as parental warmth, structure, and autonomy-support would contribute to a more open and authentic awareness and regulation of emotions (i.e., emotional integration), whereas early need-frustrating experiences such as cold, chaotic, and controlling parenting behaviors would contribute to more dysfunctional emotion regulation [11, 22].

Second, future research could adopt a more detailed approach to investigate the link between emotion regulation and basic psychological needs. First, it is important to provide a more detailed picture of emotion regulation styles in relation to specific forms of internalizing and externalizing disorders. For example, it is possible that sadness dysregulation is more strongly related to internalizing symptoms, whereas anger dysregulation may be linked more strongly to externalizing problems [19, 38]. Next, future research with larger samples would allow to investigate unique effects of the three needs (as the current sample is relatively limited in terms of sample size). Further, the current study solely relied on self-report measurements. Therefore, effects may have been exaggerated due to shared method variance. Future research including external evaluations of the outcome variables (e.g. by parents or by clinical assessment) could help to solve this problem.

Third, in line with a current trend in psychological research to focus on biological processes underlying psychological phenomena, future research could investigate the biological mechanisms associated with the present findings. For instance, respiratory sinus arrhythmia (RSA) has been identified as a reliable biomarker of emotion regulation capacity [5]. Low resting RSA (a biological process which might be linked to activity in the prefrontal cortex, [39]) has been proposed as a transdiagnostic factor that cuts across multiple forms of psychopathology [40, 41]. Further, recent studies examining the neural bases of psychological need satisfaction [42, 43], found that activities of the ventral striatum represent central neural mechanisms in psychological need satisfaction. Relatively less research has been done on the biological markers of need frustration (but see [44, 45] as first steps in this direction). Future research should further investigate neural processes associated with need frustration, as well as their link with multiple forms of psychopathology and in relation to processes of emotion regulation.

Finally, an important avenue for further research is to examine whether the current study findings generalize to other age and other clinical groups (e.g., patients with eating disorder symptoms, self-injurious behavior, addiction). Given the universality of basic psychological needs (e.g. [46]), similar results would be expected with other samples.

Summary

The present study confirmed that dysfunctional emotion regulation is a transdiagnostic process underlying adolescents' internalizing and externalizing symptoms. Basic psychological need frustration was a partial mediator in this relation. Further, adaptive emotional regulation (i.e., emotional integration) played a buffering role in associations of low need satisfaction and high need frustration with internalizing problems. The findings in this study may have applied value as they point to the potential benefits of incorporating a focus on both emotion regulation and basic psychological needs in transdiagnostic frameworks. Although it has become common in current clinical practice to help young people regulating their emotions (see e.g. [47]), an integrated approach which increases both the quality of adolescents' affective experiences (see [48, 49]) and their capacity to deal effectively with need-frustrating experiences (i.e., emotional integration) has the potential to strengthen adolescents' resilience in fundamental ways and to protect them against maladjustment.

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Compliance with Ethical Standards

Conflict of Interest The authors report no conflicts of interest.

Ethical Approval All procedures performed involving human participants in this study were in accordance with the ethical standards of the Ghent University Institutional Review Board and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Informed Consent Informed consent was obtained from all individual participants included in the study.

Appendix: Means, Standard Deviations, and Correlations Between the Three Separate Needs, Emotion Regulation and Psychopathology

	DYS	SUP	INT	AS	RS	CS	AF	RF	CF	INT	EXT
Dysregulation (DYS)	–										
Suppression (SUP)	−.21**	–									
Integration (INT)	.02	−.41***	–								
Autonomy satisfaction (AS)	−.26***	−.18*	.34***	–							
Relatedness satisfaction (RS)	−.33***	−.21**	.40***	.62***	–						
Competence satisfaction (CS)	−.39***	−.20**	.27***	.69***	.63***	–					
Autonomy frustration (AF)	.29***	.26***	−.19**	−.64***	−.53***	−.60***	–				
Relatedness frustration (RF)	.43***	.09	−.18*	−.53***	−.71***	−.58***	.58***	–			
Competence frustration (CF)	.48***	.14†	−.25***	−.60***	−.54***	−.75***	.56***	.63***	–		
Internalizing problems (INT)	.49***	.09	−.23**	−.56***	−.62***	−.70***	.64***	.67***	.75***	–	
Externalizing problems (EXT)	.38***	.16*	−.20**	−.17*	−.27***	−.22**	.35***	.39***	.31***	.42***	–
M	2.95	3.27	3.17	3.21	3.65	3.13	2.85	2.25	3.11	23.82	12.49
SD	0.82	0.78	0.67	0.85	0.94	0.98	1.04	1.01	1.13	14.54	8.65

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