MENTAL HEALTH OF THERAPEUTIC STUDENTS

ACCEP TED MANUSCRIPT

Mental Health of Therapeutic Students: Relationships with Attitudes, Self-Criticism, Self-Compassion, and Caregiver Identity

Citation

Abstract

As mental health awareness increases, more students enrol to therapeutic subjects, aspiring to help others' mental wellbeing. While mental health of other caring students has been explored, therapeutic students' mental health has not been investigated thoroughly. This study aimed to explore relationships between mental health, mental health attitudes, self-criticism/self-reassurance, self-compassion, and caregiver identity of counselling and occupational therapy students. One hundred forty-five students, recruited through opportunity sampling, completed measures about those constructs. Correlation and regression analyses revealed that their mental health was associated with attitudes, self-criticism/self-reassurance and self-compassion. Self-criticism and internal shame were independent predictors of mental health. Findings will inform the mental health status of therapeutic students and help identify better solutions for their challenging mental health.

Keywords: counselling students, occupational therapy students, mental health, mental health attitudes, self-criticism, self-compassion
Introduction

Caring profession subjects are one of the most popular disciplines in UK universities. Approximately 60% of all the 700,000 undergraduate applicants (420,000 applicants) applied to this discipline in 2014 (McGhee, 2015), and more than 20% of all the 2.3 million UK students (a half million students) were in undergraduate or postgraduate programmes in this discipline in 2015-2016 (Higher Education Statistics Agency, 2017). This is not the global norm. For example, business is the most popular subject in America, recruiting 20% of all applications (National Center for Education Statistics, 2016), and social science is most popular in Japan, accounting for 33% of all university students (Ministry of Education, Culture, Sports, Science and Technology-Japan, 2015). In the Netherlands, business management and the human resources studies are the most popular subject, enrolling 12,000 students – more than twice of the second and third most popular subjects, sociology and law (5,500 students each; Statistics Netherlands, 2017). One pronounced reason for the popularity of caring profession subjects in the UK is a high rate of graduate employment: for example, more than 90% of occupational therapy students are in employment within six months post-graduation (Association of Graduate Careers Advisory Services, 2017). Caring professions include allied health professions (e.g., occupational therapy, physiotherapy), counselling, clinical psychology, nursing, social work, and teaching (Hugman, 2005); students in these professions often have a strong identity as a caregiver, taking care of other humans, whether physically, mentally, emotionally or spiritually (Kotera, Green & Van Gordon, 2018b). Regardless of the popularity of caring profession subjects, many students in these disciplines suffer from mental health problems: nursing students in the UK are more stressed than students of any other subjects (Por, 2005), and social work students have high levels of depression, anxiety and stress (Horton, Diaz, & Green, 2009; Kotera, Green & Sheffield, 2018c). This is a serious problem, because caring professionals work with patients’ health,
and poor judgement caused by mental distress can be detrimental to patients’ wellbeing (e.g., wrong dose, timing or types of medications administered).

Because of the ever-increasing awareness on mental health in the country, the subjects that focus on mental health such as counselling and occupational therapy have recruited many students (Complete University Guide, 2018). Similar to other caring subject students such as nursing and social work, more than one third of students in this group (counselling and occupational therapy students) are mentally distressed (e.g., depression, low self-esteem; Boellinghaus et al., 2013; Brooks, Holttum & Lavender, 2002). Therefore, this study focused on two groups of therapeutic students, namely counselling and occupational therapy students in the UK.

**Negative Attitudes Towards Mental Health Problems**

Students’ poor mental health may be exacerbated by their negative attitudes towards mental health problems, believing that having a mental health problem implies weakness and inadequacy, leading to a sense of shame (Gilbert et al., 2007). Negative mental health attitudes delay students’ seeking help, which can lead to serious clinical outcomes (e.g., addictions, suicide; Brown, 2018). High negative attitudes towards mental health problems were identified in UK social work students, nursing students and business students, and their negative attitudes were related to, and predicted a great variance of their mental health: students who saw mental health problems negatively tended to have poor mental health (Kotera, Conway & Van Gordon, 2019; Kotera et al., 2018b, 2018c). In particular, caring students, who were highly aware of their future professional standard as a caregiver, had relatively high levels of negative attitudes including shame, as they may have believed that having a mental health problem meant they had failed as a caregiver (Kotera et al., 2018c, 2019). Mental health attitudes are important to mental health, however, therapeutic students’
mental health attitudes, to date, have not been investigated in depth. Indeed, previous research has elucidated some attitudinal components of this student group. For example, counselling students had relatively positive attitudes (i.e., empathetic rather than judgemental) towards self-harm in their clients (Fox, 2016), while their attitudes towards people with special needs became more negative during an undergraduate counselling programme in Turkey (Batik, 2018). Counselling trainees were hesitant about receiving personal therapy, required by the British Psychological Society, to become a counselling psychologist (Kumari, 2011). Occupational therapy students reported stigma associated with working in the mental health field, because it involves high workload and uncertainty of treatment outcomes (Cusick, Demattia & Doyle, 1993), illustrating their perception that recovery from mental health problems is difficult and relies on the clients (Davis, 2008). An external locus of control (i.e., believing that their clinical outcomes rely on their clients) was related to low life satisfaction in healthcare students (Karaman, Nelson & Cavazos Vela, 2018). These findings highlight the importance of mental health attitudes to mental health of healthcare students. In this study, the relationships between these variables will be investigated in more detail.

**Self-Criticism, Self-Reassurance, Self-Compassion and Caregiver Identity**

Self-criticism (negative evaluation of self, highlighting one’s negatives; Gilbert et al., 2004) and self-reassurance (ability to pay attention to one’s positives in challenging times; Gilbert et al., 2004) are also related to mental health problems. Relationship between mental distress, self-devaluation, and a lack of self-worth has been reported for many years (Radden, 2000). Freud (1917) suggested superego (self-criticism) as a means to protect the ego from getting angry, in order to fit into the social community, illustrating the original intention of self-criticism: social affiliation. Gilbert et al. (2004) described how self-criticism was formed:
Parents threaten or attack their children to correct the children’s behaviours (e.g., if you don’t do X, no one will like you). Children then internalise the threats and attacks to self-regulate their behaviours (e.g., if I don’t do X, no one will like me). Despite underlying positive intentions, self-criticism frequently has negative consequences. Cognitive therapists claimed that negative automatic thoughts about oneself were linked to mental health problems (Beck, Rush, Shaw, & Emery, 1979). Kohut (1971, 1977) related this to one’s early life experiences, noting that one can nurture self-reassuring qualities (opposing to self-criticism) to soothe oneself when facing one's life challenges and inadequacies. Children identify with an idealised quality of their parents, who recognise the children’s competency, leading to high self-reassurance, whereas children may develop high self-criticism without idealised figures. Self-criticism was positively related, and self-reassurance was negatively related to mental health problems in 87 UK social work students (Kotera et al., 2018c). Further, self-criticism and self-reassurance were identified as the key components for good mental health among 131 Japanese workers: how you treat yourself affects your mental health (Kotera, Gilbert, Asano, Ishimura & Sheffield, 2018a). Therefore, we hypothesised that self-criticism and self-reassurance will be related to the mental health of therapeutic students.

Another construct that is related to mental health (and self-criticism/self-reassurance, and mental health attitudes) is self-compassion, i.e., understanding and kindness to the self during life’s challenging times, while committed to mitigate them (Neff, 2003). Self-compassion has been strongly related to better mental health in UK university students: students who were more kind towards themselves tended to have better mental health (Kotera et al., 2018b, 2018c, 2019; Stallman, Ohan & Chiera, 2018). Self-compassion leads to good mental health by counteracting self-criticism (Trompetter, de Kleine & Bohlmeijer, 2017). Therapeutic approaches targeting compassion reduced shame and self-criticism, resulting in better mental health (Braehler et al. 2013; Gilbert & Procter 2006). Among therapeutic
students, self-compassion training has been suggested as an essential strategy for their mental health (Beaumont & Hollins Martin, 2016; Nelson, Hall, Anderson, Birtles & Hemming, 2018), however no study, to date, has explored this relationship focusing on counselling and occupational therapy students.

Lastly, how therapeutic students perceive themselves as a caregiver - caregiver identity - is worthy of examination, as this identity has been related to lower self-care and self-awareness in caring professionals (Kotera et al., 2018c). Role identity theory (McCall & Simmons, 1978) posits that behaviours and perceptions are influenced by recognition of self in personal and professional roles. Therapeutic students often have a strong caregiver identity, which is a key reason why they enrolled onto the programme (Davis, 2008). Strong caregiver identity was associated with poor mental health in social work students (Kotera et al., 2018c). Accordingly, we hypothesised that caregiver identity will be associated with mental health of therapeutic students.

Aims and Hypotheses

This study aimed to elucidate mental health of therapeutic students, namely relationships between mental health, mental health attitudes (degree of a belief that having a mental health problem implies weakness and inadequacy), self-criticism (negative evaluation of self), self-reassurance (how much one focuses on their positives), self-compassion (kindness and understanding towards oneself), and caregiver identity (how strongly one identifies themselves as a caregiver). We hypothesised that attitudes, self-criticism, self-reassurance, self-compassion, and caregiver identity will be associated with, and predict mental health.

Method
Participants
Participants, aged 18 years or older, were counselling or occupational therapy students at a UK university in the Midlands area.

Instruments

Mental health was measured using the Depression, Anxiety, and Stress Scale 21 (DASS 21), which was a shortened version of DASS 42 (Lovibond & Lovibond, 1995). The 21 items were responded on four-point Likert scale (0='Did not apply to me at all' to 3='Applied to me very much or most of the time'), measuring the levels of depression, anxiety, and stress (seven items each). The items for depression included ‘I felt down-hearted and blue’, the ones for anxiety included ‘I was worried about situations in which I might panic and make a fool of myself’, and the ones for stress included ‘I felt that I was using a lot of nervous energy’. These subscales had good reliability (α=.87-.94; Antony, Bieling, Cox, Enns & Swinson, 1998). For the purpose of this study, these subscales were combined to calculate the scores for mental health problems (Lovibond & Lovibond, 1995).

Mental health attitudes were assessed using the Attitudes Towards Mental Health Problems (ATMHP) scale (Gilbert et al., 2007), comprising 35 items on four-point Likert scale (0='Do not agree at all' to 3='Completely agree’) into four sections. The first eight-item section corresponded to how their community’s and family’s perceive mental health problems (e.g., ‘My community/family would want to keep their distance from someone with mental health problems’). The second section, ten items, evaluated how their community and family would perceive them, if they had a mental health problem (i.e., external shame; e.g., ‘I think my family/community would see me as inferior’). The community was defined as their peers in the university. The third section related to internal shame - how they would perceive themselves if they had a mental health problem (e.g., ‘I would blame myself for my problems’, five items). The last 12 items, the fourth section, addressed reflected shame: a)
how their family would be perceived if they had a mental health problem (family-reflected shame; e.g., ‘My family would lose status in the community’) and b) worries of reflected shame on themselves, if a close relative had a mental health problem (self-reflected shame; e.g., ‘I would worry that my own reputation and honour might be harmed’). All of the subscales had high internal consistency (α=.85-.97; Gilbert et al., 2007).

_Self-criticism and self-reassurance_ were evaluated using the Forms of Self-Criticising/Attacking & Self-Reassuring Scale (FSCSR), a 22-item on five-point Likert scale (0=’Not at all like me’ to 4=’Extremely like me’). FSCRS (Gilbert et al., 2004) examined how people treat themselves in difficult times relating to self-criticalness (inadequate-self and hated-self), and self-reassurance (reassured-self). Inadequate-self, composed of nine items, referred to a sense of personal inadequacy (e.g., ‘There is a part of me that puts me down’), hated-self, five items, to a desire to persecute the self (e.g., ‘I do not like being me.’), and reassured-self, eight items, to a sense of supporting the self (e.g., ‘I find it easy to forgive myself.’). All the subscales had high internal consistency (α=.86-.90; Gilbert et al., 2004).

_Self-compassion_ was assessed using the Self-Compassion Scale-Short Form (SCS-SF; Raes, Pommier, Neff & Van Gucht, 2011), a 12-item on five-point Likert scale to indicate how often you behave in a kind and understanding manner towards yourself in challenging life situations (0=’Almost never’ to 5=’Almost always’), which was a shortened version of the 26-item Self-Compassion Scale (Neff, 2003); the scale had high internal consistency (α=.86; Raes et al., 2011). No subscales were used as recommended by Raes et al. (2011). Items included ‘When something painful happens I try to take a balanced view of the situation’.

Lastly, the Role Identity Scale (RIS), with eight-items on five-point Likert scale (1=’Strongly disagree’ to 5=’Strongly agree’), was used to measure caregiver identity. It had high internal consistency (α=.78; Siebert & Siebert, 2005). RIS considered how respondents
view themselves as a caregiver, and how they perceive others view themselves as a caregiver (Siebert & Siebert, 2005); items included ‘It is difficult to tell friends or family that I cannot help them with a problem’. There were no subscales in RIS.

**Procedure**

Participants were recruited using opportunity sampling via programme tutors’ announcements. Paper-based survey was distributed in the class. Students who were on a study break were excluded from the study. No participation incentives were awarded.

After consenting to participate in the study, participants received the scales along with questions about gender and age, followed by the debrief. Information about available mental health services, inside and outside the university, was provided, ensuring that any distressing issues raised by participating in the study, might be treated in a sensitive manner. Ethics approval was obtained from the University Research Ethics Committee.

The collected data were, first, screened for the outliers and assumptions of parametric tests. Second, Pearson’s correlation analyses were conducted to calculate relationships among mental health, attitude, self-criticism, self-reassurance, self-compassion and caregiver identity. Although we acknowledged that multiple correlations were calculated, we did not apply the Bonferroni correction: rather we indicated significant correlations at $p<0.05$, 0.01, and 0.001. Third, stepwise multiple regression analysis was conducted to identify independent predictors of mental health. SPSS version 25 was used for correlation and regression analyses.

**Results**

*Demographic Information*
One hundred forty-five therapeutic students of 166 (87.3%) full-time students (15 males and 130 females; 133 undergraduates and 12 postgraduates; age mean=26.80, standard deviation=8.64, range=17-52 years old; 131 British [90.3%], 7 other European [4.8%], 4 Asian [2.8%], 2 African [1.4%], and 1 North American [0.7%]) completed the self-report measures about mental health, attitudes, self-criticism/self-reassurance, self-compassion, and caregiver identity. The gender balance of our sample (10% male) was similar to occupational therapists and counsellors (Brown, 2017; Grant, Robinson & Muir, 2004), suggesting good representativeness.

**Descriptive Statistics**

Six scores in the family attitudes, and eight scores in the family external shame subscales were winsorised (amending outliers closer to the upper/lower limit; Tukey, 1962) as identified as outliers, using the outlier labelling rule (Hoaglin & Iglewicz, 1987). Internal consistencies for all of the scales and subscales were high (α ≥ .84).

[Insert Table 1 about here]

**Relationships Between Mental Health and the Other Variables (H1)**

Because many of the subscales and scales were not normally distributed as assessed by Shapiro-Wilk's test (p<.05), all of the subscales and scales were square-root-transformed to satisfy the assumption of normality. Pearson’s correlations were used to examine relationships between mental health, attitude, self-criticism, self-reassurance, self-compassion and caregiver identity (Table 2).

[Insert Table 2 about here]

As presented in Table 2, mental health problems were positively associated with family attitudes, family and community external shame, internal shame, and family-reflected shame,
and inadequate- and hated-self (not with community attitudes and self-reflected shame), while negatively associated with reassured-self and self-compassion: particularly stronger correlations \( p<0.001 \) with internal shame, family-reflected shame, inadequate-self, hated-self, reassured-self, and self-compassion. Caregiver identity was not associated with mental health problems; it was only associated negatively with community attitudes and self-compassion.

**Predicting Mental Health Problems**

Stepwise multiple regression analysis was conducted (Table 3) to explore the relative contribution of the subscales in the mental health attitudes scale (Attitudes Towards Mental Health Problems; subscales = Community Attitudes, Family Attitudes, Community External Shame, Family External Shame, Internal Shame, Family-Reflected Shame, and Self-Reflected Shame) and the self-criticism/self-reassurance scale (Forms of Self-Criticising/Attacking & Self-Reassuring Scale; subscales = Inadequate-Self, Hated-Self, and Reassured-Self), and the total score of the Self-Compassion Scale (predictor variables) to mental health problems (Depression, Anxiety and Stress Scale 21; outcome variable). Gender and age were entered first to statistically adjust for their effects (step one), then all the other predictor variables (mental health attitudes, self-criticism, self-reassurance, and self-compassion) were entered (step two). Because of the many predictor variables \( n=11 \), the adjusted coefficient of determination (Adjusted \( R^2 \)) was reported. Multicollinearity was not a concern (all the VIF values \( \leq 10 \)).

[Insert Table 3 about here]

In total, the predictor variables (mental health attitudes, self-criticism, self-reassurance, and self-compassion) predicted 53% of the variance in mental health problems, indicating a large
effect size (Cohen, 1988), after adjustment for gender and age, with internal shame, inadequate-self, and hated-self as significant positive predictors. Reassured-self and self-compassion did not predict the variance in mental health problems.

**Discussion**

This study aimed to explore the mental health of university students studying counselling or occupational therapy. Our analyses revealed that mental health was associated with mental health attitudes, self-criticism, self-reassurance, and self-compassion. Further, mental health attitudes, self-criticism, self-reassurance, and self-compassion predicted 53% of variance in mental health problems; internal shame and self-criticism were identified as predictors of mental health problems.

Mental health was associated with attitudes, self-criticism, self-reassurance, and self-compassion, while it was not related to caregiver identity. The significant correlations among mental health, attitudes, self-criticism, self-reassurance, and self-compassion were consistent with previous findings (Kotera et al., 2018b, 2018c, 2019; Stallman et al., 2018): mentally distressed students tend to have negative attitudes towards mental health and fail to treat themselves in an understanding manner. This may highlight the importance of mental health education and self-care in this student group. For example, educating students that mental health problems could happen to anybody and that having those problems does not mean they have failed to be a caring professional, can alleviate their negative attitudes towards mental health problems (Watson et al., 2017). Equally, as emphasised in the ethical framework of the British Association for Counselling and Psychotherapy (2018), self-care education and training can benefit therapeutic students’ mental health firmly. Self-care training (three to six hours) was effective for Norwegian occupational therapy students’ wellbeing, and the positive effects were maintained at three- and ten-month follow-ups (Shwank, Carstensen,
Yazdani & Bonsaksen, 2018). Reflective practice - revisiting their experience, actions, and impacts to gain understanding of self (Boud, Keogh & Walker, 1985) - was recommended to healthcare students to identify their needs for help (in practice, academic work, and personal life) and to engage in positive wellbeing behaviours (Gold, Johnson, Leydon, Rohrbaugh & Wilkins, 2015; Mann, Gordon & Macleod, 2007). Given that the sources of UK students’ stress are diverse (e.g., academic pressure, financial issues, social life, employment; Brzezinski, Millar & Tracey, 2018), such reflective practice from a holistic view would be helpful. Moreover, improving their social support through study groups or workshops may be also useful, as it can counter loneliness and lead to better self-care (Stallman et al., 2018). Future research should explore the effects of these exercises on therapeutic students’ self-care and mental health knowledge, aiming to cultivate their self-compassion, reduce self-criticism, and improve their mental health attitudes, which may result in better mental health.

Contrary to our hypothesis, caregiver identity was not as associated with mental health; it was only associated negatively with community attitudes and self-compassion. While recent kindness studies reported that offering care to others reduced the mental distress of the givers (Hamilton, 2017), correlations between caregiver identity and mental health problems were not observed in our sample of therapeutic students. Negative relationships of caregiver identity with community attitudes and self-compassion may suggest that students who had strong caregiver identity tended to believe that their peers see mental health more positively (negative community attitudes), whereas be less understanding of their own inadequacies (low self-compassion). In other words, strong caregiver identity was related to two contrasting views: while caregiving students saw others positively, they saw themselves negatively. This may imply low self-esteem, which can stop people receiving care, as students with low self-esteem do not believe they are worthy of receiving care (Marigold, Cavallo, Holmes & Wood, 2014). Self-esteem and self-compassion are often discussed as
conflicting constructs (Neff, 2003): while self-esteem is based on difference among others (acceptance is given from a comparison where one is above others), self-compassion is based on the sameness with others (believing that one is intrinsically worthy of acceptance) (Stephenson, Watson, Chen & Morris, 2018). Regardless of their strong correlation ($r=0.58$, $p<0.001$), self-compassion predicted self-worth whereas self-esteem did not (Stephenson et al., 2018). Again, this may implicate the importance of introducing and practicing self-compassion in therapeutic students. Indeed, giving care to others is essential in their career (BACP, 2018); however, being able to notice their own mental health, and accepting compassion for oneself may be equally important, as our results indicate. Future research should explore effective self-compassion interventions for this student group.

Lastly, self-criticism and internal shame were significant predictors of mental health problems in therapeutic students. Similar relationships were found in UK social workers too (Kotera et al., 2018b), suggesting that these occupation-oriented students may be frequently comparing themselves against their professional standards, as they have to satisfy them to become a therapist. Therefore, they may tend to focus on what they are lacking as opposed to what they possess, a strength-based approach identifying individual’s strengths and how to develop them (Cross & Cheyne, 2018). This may explain the strong predictions of self-criticism and internal shame on mental health. It is ironic that the Care Act 2014 recommends the strengths-based approaches for patients, encouraging carers to support patients’ strengths and capabilities, while caring trainees may be mentally distressed for their shortcomings when comparing themselves against the standards. What may be useful to therapeutic students is awareness that having a mental health problem does not mean they have failed as a caregiver (even a professional therapist can suffer from it) and that coping with and resilience against mental distress can be nurtured (i.e., it is not an inherent fixed quality). For example, inter-professional conferences would be useful, where students are able to discuss
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professional matters with other professionals. The researchers of this study have been involved in those conferences and attending students have reported that finding out that even professional therapists can suffer from mental distress would alleviate their self-criticism and shame for feeling stressed (Kotera et al., 2018b). These events, facilitating conversations among different levels of practitioners, should be implemented so that trainees can have a more realistic image of how professionals should be, rather than the perfect image the professional standards can portray. Likewise, accurate understanding of mental health is needed from educators and students. For instance, the words ‘emotional resilience’ have been used widely, and sometimes incorrectly which can cause students to self-doubt (Gask, 2015). Emotional resilience needs to be considered holistically and, again, it is a quality that can be nurtured (McAllister & Lowe, 2011). However, many students and educators see it as a fixed quality, thus one either has it or not. In conclusion, accurate knowledge of mental health needs to be taught to students in order to support their mental health.

Several limitations to this study need to be noted. First, although our participating sample was large and representative of those recruited and professionals (Brown, 2017; Grant et al., 2004), opportunity sampling restricted the sample to those studying at a single university. For example, recruiting from multiple universities would increase generalisability of our findings. Second, social desirability bias might have been present, as self-report measures were used to explore emotions, such as shame, which are prone to such bias. Thirdly, while our findings offer useful insights to therapeutic students’ mental health, the causal direction of these effects has not been explored. Longitudinal data would help determine the temporal patterning of the identified relationships and to help develop interventions. Finally, this study did not explore any qualitative data: such data would give more comprehensive understanding of mental health of therapeutic students (e.g., how ‘shame’ was experienced or how ‘self’ existed in their caregiver identity).
As the awareness of mental health has increased, more UK students have been enrolled to therapeutic subjects, aiming to help with people’s mental health. This study elucidated associations between their mental health and mental health attitudes, self-criticism, and self-reassurance, self-compassion. Self-criticism and internal shame were identified as strong predictors of mental health. Accordingly, our findings should inform educators, researchers, and students to focus on self-criticism and shame as avenues for better mental health and mark them as targets for challenging mental health.
References


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Table 1. Descriptive statistics of all the study variables in 145 therapeutic students.

<table>
<thead>
<tr>
<th>Measured Constructs</th>
<th>Scales</th>
<th>Subscales (Range)</th>
<th>Mean</th>
<th>Standard Deviation</th>
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<td>Depression Anxiety and Stress Scale</td>
<td>Mental Health Problems (0-126)</td>
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<td>26.83</td>
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<td>7.30</td>
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Constructs are presented in the order of appearance in the manuscript.
Table 2. Correlations between mental health, mental health attitudes, self-criticism/self-reassurance, self-compassion, and caregiver identity in 145 therapeutic students

<table>
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*p<0.05, **p<0.01, ***p<0.001

Constructs are presented in the order of appearance in the manuscript.
Table 3. Multiple regression: Mental health problems for mental health attitudes, self-criticism, self-reassurance, and self-compassion in 145 therapeutic students

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B=unstandardised regression coefficient; SEβ=standard error of the coefficient; β=standardised coefficient; *p<0.05; **p<0.01; ***p<0.001

 Constructs are presented in the order of appearance in the manuscript.