

Research

Journaling your challenges: mechanisms of resilience journals to support German first-semester business students during their transition to university

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Abstract

Transition to university can be challenging, but writing interventions can be a helpful way of supporting first-semester students. Why these interventions are effective is still not fully understood, however. To explore the underlying mechanisms, two versions of a resilience journal were used in this study. They were designed to either broaden attention toward all challenges or to prime students' attention to successfully mastered challenges. It was hypothesized that priming toward mastery is more effective but that both versions would increase students' resilience and satisfaction. Hypotheses were tested in a pre-post design with 62 first-semester students randomly filling out one of the two versions for 6 weeks. The outcomes were compared to students without an intervention, and journal entries were analyzed for challenges and coping strategies. A content analysis of the journal entries revealed that most challenges were directly related to university. Problem-focused coping strategies were most often used to address challenges. Both intervention groups showed a decrease in life satisfaction during the first 6 weeks of university, but the intervention designed to broaden attention was more effective in mitigating this decrease. The same intervention was also more advantageous in promoting students' resilience. The results highlight the vulnerability of students during their transition to university and the potential of writing interventions that include reflection on all challenges.

Keywords Resilience · Journal intervention · First-semester students · Study satisfaction · Life satisfaction · Study satisfaction · Challenges · Broaden-and-build theory

1 Introduction

For many students, the transition to university is a special time in their lives, and like most transition phases, this transition also presents a risk of increased vulnerability through multiple new challenges that might result in psychological disturbances [1–6]. The results of earlier research studies show that university students report a high stress level [7] and are at risk for mental health problems [8].

The latest results, gathered during the COVID-19 pandemic, reveal that students increasingly report a lack of focus, attention problems, and difficulties in concentrating [9, 10], accompanied by a pronounced decrease in well-being [11], and issues in making connections, satisfaction with education, and adjusting to challenges [12]. A high

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prevalence of depression and anxiety symptoms in this population was already identified before the pandemic and continues to be widespread [8, 10, 13–17]. In addition, self-harming and suicidal thoughts increased [10, 16, 17].

In particular, first-semester students at the beginning of their studies have a high risk for stress and mental health problems [8, 18, 19], and during the pandemic, their mental health was especially affected [14, 16, 17].

Copeland et al. [9] claim that “[s]tudents, and particularly first-year students, may be in need of more institutional support than ever” (p. 140). In line with this claim, the need for more psychological support has been formulated by several authors studying the mental health of students [10, 12–14, 20–23].

To support students, the important role of resilience in preventing mental health problems and fostering well-being has been repeatedly highlighted. Resilience protects students against loneliness, depressive symptoms, and symptoms of generalized anxiety [20, 22]; shows positive effects on their coping and well-being [24–26]; and is linked to academic progress, better grades, and reduced drop-out numbers [27–29]. Archana and Singh [30] even label resilience as “one of the most important factors that contribute towards the well-being of students” (p. 228).

According to Luthar et al. [31], resilience can be defined as a “dynamic process encompassing positive adaptation within the context of significant adversity” (p. 543). While other definitions exist, most of them include the core concepts of *adversity* and *positive adaptation* [32]. The definition from Luthar et al. [31] was used in this study because it best reflects the dynamic properties of resilience, an approach that is recommended in intervention research [33]. As the research literature describes it, resilience has dynamic properties, and resilience interventions can increase resilience and well-being, especially in higher education students [34–36], and can reduce their stress, anxiety, and depression [36–39]. A review of resilience interventions in higher education students by Brewer et al. [40] found that most interventions were provided in face-to-face settings, predominantly at university, and often lacked a suitable control group. Reviews in other areas also found that resilience interventions were effective but predominantly delivered in a face-to-face setting [33, 41–44]. Resilience interventions are seen as having high potential to support students’ mental health [11, 45], but during the pandemic, new methods of delivery had to be explored and, in general, more longitudinal research is necessary [14, 21].

To address these needs, we developed and evaluated resilience journals, following journal interventions in positive psychology [46, 47]. In the first implementation of these interventions, resilience increased in a general student sample, but no significant differences between different journal versions were found [48]. The different versions were designed following theoretical considerations used in other writing interventions and mainly differed in how they incorporated the core concepts of resilience.

One theory used to design a resilience journal is the *broaden-and-build theory* [49]. According to this theory, broadened attention and cognition lead to more cognitive flexibility, creativity, and the incorporation of experiences from one’s surroundings that otherwise would have been excluded [50]. These effects of broadened attention and cognition provide resources for coping with adversity and transforming negative emotions. As a result of this process, well-being and resilience increase and lead to more positive emotions, which again lead to broadened attention and cognition, resulting in a positive upward spiral [49]. From a resilience perspective, this theory implies that it is less important whether a challenge or adversity was mastered successfully and more important how a person perceives and thinks about the challenge and its outcome.

Other theories, however, argue that it is more important whether the challenge or adversity was mastered successfully. In their writing intervention, Risch and Wilz [51] theorized that any effectiveness arose from *resource priming*, and Wing et al. [52] argued that their interventions led to a greater *sense of mastery*. Both explanations are based on *mastery theory*, which implies that overcoming challenges leads to a sense of mastery, as well as a knowledge of reliable resources and coping strategies, which can be of advantage when future challenges arise.

Despite writing interventions having empirically proven to be effective, there is still no definitive explanation for that effectiveness [53]. The two different theoretical considerations present starting points for testing through resilience journals. When developing a writing intervention to develop resilience, the two mechanisms imply differences in the inclusion of unsolved adversities and challenges. On the one hand, broadening attention in the context of resilience should include a reflection on adversities that have not been solved. This broadening of attention could help the user to learn from failed attempts or think differently about unsolved challenges. On the other hand, focusing only on mastered adversities excludes adversities that have not been solved successfully. This could lead to a higher sense of mastery and a stronger focus on successful coping strategies without the negative impact of failed attempts.

These different mechanisms were operationalized in two separate versions of a resilience journal [48]. While one journal version was designed to encourage reflection on challenges and adversities of all kinds (the Attention Version; AV), a second version was designed to encourage reflection on successfully mastered challenges and the related

resources and coping strategies (the Mastery Version; MV). Descriptive results showed higher effects on resilience for participants filling out the MV rather than the AV, but these differences did not surpass the significance level of $p < 0.05$ [48]. This first intervention was already carried out during the pandemic and showed medium to small effect sizes [48], just like similar interventions outside the pandemic context [33, 37, 54]. Therefore, the results are promising due to the tendency of positive psychology interventions to produce smaller effects during the pandemic [55]

Despite hinting at an advantage for the MV and therefore of mastery theory, these assumptions need to be further verified. In particular, the implementation of the two journal versions over a longer period could give more insights into the underlying mechanisms.

1.1 Aim and hypotheses

To gain further insights into the mechanisms behind resilience journals, the aim of this study was to evaluate the effects of the two journal versions on first-semester student resilience and satisfaction over a longer period of time. The evaluation was guided by the following hypotheses:

H1: First-semester students filling out a resilience journal will show higher resilience and satisfaction than students without an intervention.

H2: Students filling out the MV will show a stronger increase in resilience and satisfaction compared to students filling out the AV.

The journal entries and evaluation results could also be used to gain further insight into students' challenges and coping strategies during the transition phase.

2 Method

2.1 Participants and sampling procedure

To determine the adequate sample size, the software G*Power (version 3.1.9.2) was used. Sample size was calculated for a repeated measurement MANOVA with a medium effect size, an α -error of 5%, and a β -error of 20%. Results revealed that a sample size of $N = 66$ would be suitable for the design of this study.

Participation in this study was promoted during the students' orientation week prior to the first week of lectures. First-semester students were asked to participate in the data collection via e-mail, social media posts, and online events during this week. Participation was voluntary, but students who participated could take part in a raffle for 5 x €50 or receive course credits if their study program included course credits for participation in scientific studies. In total, 87 students (66.7% female, age: $M_{years} = 20.43$, $SD_{years} = 3.03$) registered for the journal intervention and gave informed consent for participation and data collection.

The participating students were randomly assigned to one of two journal versions (see Sect. 2.2). Sixty-two students completed their version of the journal intervention and participated in the post-test, while 25 (66.7% female, age: $M_{years} = 19.14$, $SD_{years} = 2.80$, 56.0% MV) did not complete the post-test and were therefore excluded from the statistical analyses. The remaining 62 students were between 18 and 35 years of age ($M_{years} = 20.9$, $SD_{years} = 3.0$), and 67.7% identified as female. All students were studying at the business school of the University of Mannheim and started their bachelor's program in fall 2020. Most students (75.8%) reported a major in economic and business education, while the remaining students majored in business administration.

Measures were also included in a first-semester student poll for students majoring in economic and business education. In addition, 103 first-semester students who did not participate in any intervention took part in the student poll. These students represent the control group in the following analysis. Students in the control group were between 17 and 40 years of age ($M_{years} = 21.2$, $SD_{years} = 3.1$), and 68.0% identified as female.

2.2 Intervention

The intervention used in this study was a resilience journal [48] adapted to a weekly format. The following two versions were completed by the students for 6 weeks:

MV: Every day, we master many challenges, both small and big, in private and academic contexts. Think back over the past week and enter five challenges that you mastered this week in the field below. For each challenge, write down how you mastered it.

AV: Every day, we face many challenges, both small and big, in private and academic contexts. Think back over the past week and enter five challenges that you encountered in the field below. For each challenge, write down what specifically was challenging for you.

Randomization of participants resulted in 32 students completing the AV (62.5% female, age: $M_{years} = 21.31$, $SD_{years} = 3.71$) and 30 students completing the MV (73.3% female, age: $M_{years} = 20.43$, $SD_{years} = 2.00$).

2.3 Measures

To evaluate the effects of the intervention, resilience was measured before and after the intervention. A separate resilience scale designed for longitudinal measurement accompanied all journal entries. To evaluate the effects on students' subjective well-being, a scale for general life satisfaction and a scale specifically designed for university students were included.

2.3.1 Resilience

The Brief Resilience Scale (BRS) is a six-item scale measuring resilience as the "ability to bounce back" (p. 195) [56]. The items, such as "I usually come through difficult times with little trouble," are rated on a 5-point Likert scale ("strongly disagree" to "strongly agree"). The German version of the BRS [57] was used in this study and has been reported as having good reliability (Cronbach's $\alpha = .85$) for a German sample. The use of the BRS in resilience research is recommended for its good validity [33] and its sensitivity in depicting change [58].

2.3.2 Dynamic resilience

The Monitoring of Actual Resilience State (MARS) [48] is a measure for dynamic changes in resilience in longitudinal data. It consists of eight items (e.g., "I could rely on myself to overcome challenges") rated on a slider control scale from "strongly disagree" to "strongly agree." The MARS showed good multi-level reliability ($\alpha = .75$) in a German student sample [48] and was included in the journals of this study. To account for the weekly format, the original prefix "Today..." [48] was replaced by the prefix "This week..."

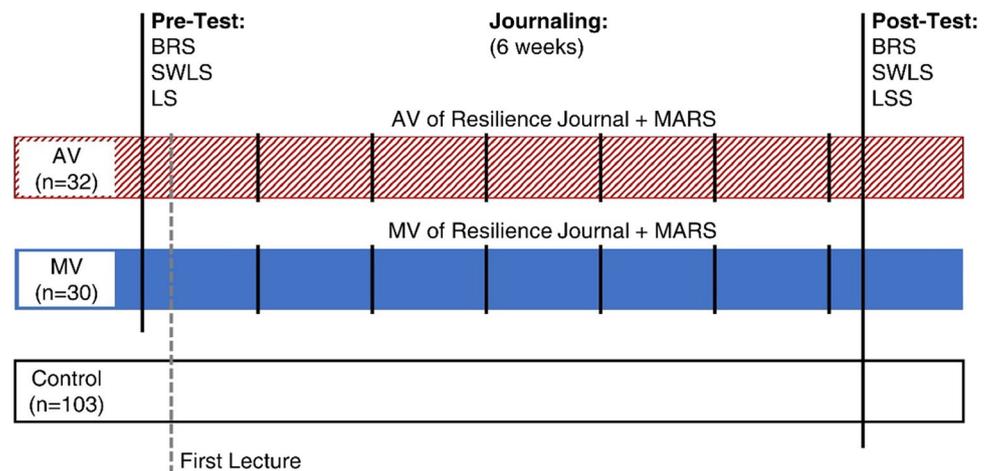
2.3.3 General life satisfaction

The Satisfaction with Life Scale (SWLS) [59] consists of five items measuring global life satisfaction as an element of subjective well-being. The items, such as "In most ways, my life is close to my ideal", are rated on a 7-point Likert scale ("strongly disagree" to "strongly agree"). Again, the German version [60], which has a very good internal consistency (Cronbach's $\alpha = .92$), was used in this study.

2.3.4 Life and study satisfaction

The Life and Study Satisfaction Scale (LSS), developed by Holm-Hadulla and Hofmann [61], is a German instrument specifically designed to measure the satisfaction of university students. The 7-item scale consists of four items assessing general life satisfaction (LS), such as "How satisfied are you currently with your life?" and three items assessing study satisfaction (SS), such as "How satisfied are you currently with your academic performance?" Although these different areas of satisfaction are proposed by the authors, all items load on only one factor and retain an internal consistency (Cronbach's α) of .84 [62]. Answers were given on a 5-point Likert scale ("not at all" to "very strongly"). This second scale for satisfaction was included to account for students' special perspective and their study satisfaction.

Fig. 1 Research Design



2.3.5 Demographic variables

Students were asked for their gender (male, female, diverse), age, study program, and semester via self-report items.

2.4 Research design

The study was carried out between September 21 and November 16, 2020. At this time, COVID-19 cases in Germany were rising, and lectures at the University of Mannheim were given in a digital format. On November 2, 2020, new contact regulations and a partial lockdown came into effect in Germany, with the closure of restaurants, sport facilities, and cultural institutions.

During the orientation week, before the first lecture in the fall/winter semester of 2020, students filled out the pre-test, consisting of their informed consent, the BRS, the SWLS, and the LS subscale. Due to the lack of participants' study experiences, the SS subscale could not be included in the pre-test. The students were then randomly assigned to one of the two journal versions; they completed their journal and the MARS every weekend for the first 6 weeks of university. Students were reminded weekly by e-mail to fill out their journals and the MARS. The weekly format was chosen to keep the workload for the students manageable. After the 6 weeks of the intervention, students filled out the post-test, consisting of the BRS, SWLS, LSS (both subscales) and demographic measures, and received a debriefing. The same measures, informed consent, and debriefing were included in a first-semester student poll of the business school in the same week. The full research design is depicted in Fig. 1.

All measures and journals were delivered online using the software SoSci Survey. Participation was possible using any device with internet access (e.g., smartphone, tablet, or PC).

2.5 Data analyses

Journal entries for challenges and coping strategies were coded following the qualitative content analysis of Mayring [63] to gain further insights into students' experiences during their transition to university. All journal entries were included, even if the students did not complete the whole intervention.¹ Categories for analyzing challenges were built using an inductive approach, while coping strategies were coded following the taxonomy of Smith [64] in a deductive approach. This approach was chosen to allow for comparability to other studies. A quarter of all journal entries

¹ The decision to include journal entries of students who did not complete the whole intervention was made, to simultaneously analyze if specific challenges increase the risk of dropping out of the intervention. This was however not supported by the data, and no specific challenge related to drop out of the study could be identified. The exclusion of students who did not complete the whole intervention does however not change something in the relation of the mentioned challenges and therefore results would remain largely unchanged when excluding students who did not finish the intervention.

Table 1 Descriptive statistics of the dependent variables

Variable	Time	Intervention			Control	Total
		AV	MV	Combined		
BRS	Pre	3.38 (0.76)	3.29 (0.61)	3.34 (0.69)	–	–
	Post	3.59 (0.87)	3.21 (0.67)	3.40 (0.80)	3.30 (0.68)	3.34 (0.72)
SWLS	Pre	5.38 (0.98)	5.59 (0.67)	5.48 (0.85)	–	–
	Post	5.26 (1.05)	5.05 (0.82)	5.16 (0.95)	4.82 (1.00)	4.95 (0.99)
LSS	Post	3.43 (0.77)	3.31 (0.52)	3.37 (0.66)	3.15 (0.60)	3.23 (0.63)
LS	Pre	3.94 (0.53)	4.08 (0.47)	4.00 (0.50)	–	–
	Post	3.79 (0.84)	3.59 (0.55)	3.69 (0.71)	3.40 (0.71)	3.51 (0.72)
MARS	Week 1	67.92 (14.30)	60.85 (15.72)	64.64 (15.26)	–	–
	Week 2	64.16 (21.42)	63.10 (15.35)	63.64 (18.59)	–	–
	Week 3	65.22 (18.59)	56.65 (17.18)	61.00 (18.28)	–	–
	Week 4	65.80 (18.58)	65.08 (18.23)	65.46 (18.26)	–	–
	Week 5	61.63 (23.19)	60.17 (15.43)	60.94 (19.73)	–	–
	Week 6	62.04 (19.32)	59.04 (14.29)	60.54 (16.90)	–	–

N = 165. Mean values, standard deviations are in parentheses

were coded independently by a student assistant to include the perspective of an active student. Inter-rater reliability (Cohen's kappa) was computed from these ratings. Cases in which the raters disagreed were discussed until agreement was reached.

The mean scores for BRS, SWLS, and LSS were used in two one-way MANOVAs to evaluate group differences. To answer Hypothesis 1, the first MANOVA compared the post-test results of students with interventions with results from students without intervention. The second MANOVA compared the pre-post results of the two intervention groups with each other to answer Hypothesis 2. In this second MANOVA, only the mean score of the LS subscale of LSS was included, because no SS subscale was included in the pre-test. Following these analyses, separate post hoc t-tests or ANOVAs were performed for every variable separately to evaluate the effects on the individual variables. Hypothesis 2 was also analyzed with a two-level time series analysis of MARS using an AR(1) model (random intercepts, random slopes) including the intervention group as a between-person predictor.

Longitudinal analyses were performed using Mplus (Version 8.7). All remaining analyses were conducted in IBM SPSS Statistics (Version 28.0.1.0).

3 Results

3.1 Descriptive analysis

The requirements for statistical testing were evaluated and found adequate for further analysis (see supplementary material). No pre-test group differences in the dependent variables, gender, or age were found. Descriptive statistics for all dependent variables are shown in Table 1.

3.1.1 Analysis of challenges

Inductive analyses of the challenges reported in the journals resulted in five broader categories of contexts in which these challenges occurred. At 46.71%, nearly half of the challenges stemmed from the context of the *university* (e.g., learning strategies, learning motivation, performance pressure, and keeping up with lectures). The second most common area of challenges was *ways of living* (e.g., finding a job, moving to a new city, doing household chores on your own, getting enough sleep, eating healthily, and distraction through phone use), which was referred to in 24.47% of all entries. The third category, referred to in 12.78% of the entries, was *social* challenges (e.g., missing family and old friends, finding new friends, staying in touch with friends, and challenges in relationships). In 11.23% of entries, students referred to the *compatibility* of different areas in their life (e.g., combining work with university, combining family duties with university, getting enough free time to relax, and managing time). The last category, referred to in 4.60% of entries, comprised challenges related to *COVID-19* (e.g.,

worrying about the high number of infections, dealing with new lockdown regulations, getting infected, and feeling isolated). To clearly define this category, raters agreed on only including journal entries that mentioned COVID-19 or similar related words (e.g., Corona, lockdown, social distancing, new regulations, and infection numbers), while challenges that might be related to COVID-19, but not clearly mentioning it, were categorized under one of the remaining categories. Categorization of challenges reached an inter-rater reliability of $\kappa = .77$.

3.1.2 Analysis of coping strategies

The formulation of the two journal tasks affected the reporting of coping strategies. Only students in the MV were asked to report their coping strategies; consequently, insights into those strategies can only be drawn from this group. In total, 688 journal entries related to coping written by 43 students were identified and categorized following the classification of coping strategies used by Smith [64]. The results revealed that a large majority of entries (75.87%) fell into the categories of *problem-focused coping* (e.g., collecting information, facing challenges with effort and discipline, or planning ahead), while only a very small proportion (7.12%) reported *emotion-focused coping* (e.g., acceptance, equanimity, or distraction). *Social coping* was reported in 17.01% of entries (e.g., asking for help, organizing learning groups, or meeting with other students). An inter-rater reliability of $\kappa = .78$ was reached for the coping categories.

3.2 Hypothesis 1

A one-way MANOVA comparing students with intervention to students without intervention revealed no significant differences ($F_{(3, 161)} = 1.96, p = .122, \eta^2_p = .04$).

Separate post hoc t-tests revealed that students with an intervention did not report more resilience than students without an intervention ($t_{(163)} = -0.84, p = .20, d = -0.14$). With regard to life satisfaction, however, students with intervention reported significantly higher SWLS scores in a post hoc t-test than did students without intervention ($t_{(163)} = -2.12, p = .018, d = -0.34$). Similarly, students filling out any journal reported significantly more life and study satisfaction than did students without any intervention ($t_{(163)} = -2.23, p = .014, d = -0.36$).

3.3 Hypothesis 2

3.3.1 Pre-post comparison of journal version

The repeated measurement one-way MANOVA comparing the pre-post results of the intervention groups identified a significant effect of time ($F_{(3, 58)} = 8.04, p = .001, \eta^2_p = .29$) and time \times group interaction ($F_{(3, 58)} = 3.03, p = .036, \eta^2_p = .14$). The results of the separate post hoc one-way ANOVA analyses for the three variables are shown in Fig. 2; there were significant effects of time on the SWLS and LS, and significant time \times group interactions for resilience and life satisfaction measured through the SWLS. While life satisfaction decreased in both groups, students who used the AV of the resilience journal showed an increase in resilience and less reduction in life satisfaction, as measured by the SWLS.

3.3.2 Longitudinal analysis of dynamic resilience

The longitudinal analysis of dynamic resilience were performed using a two-level time series analysis with an AR(1) model, random intercepts, random slopes, and a between-person predictor. It found a small but significant positive autoregressive coefficient (0.643, $p = .024$). Between-level estimates of group effects indicated no significant influence of the journal version on dynamic resilience. Even though students who participated in the AV reported constantly higher mean values in resilience, the results for the influence of the journal version on dynamic resilience ($-2.42, p = .275$) and its autoregression ($-0.90, p = .288$) were not significant.

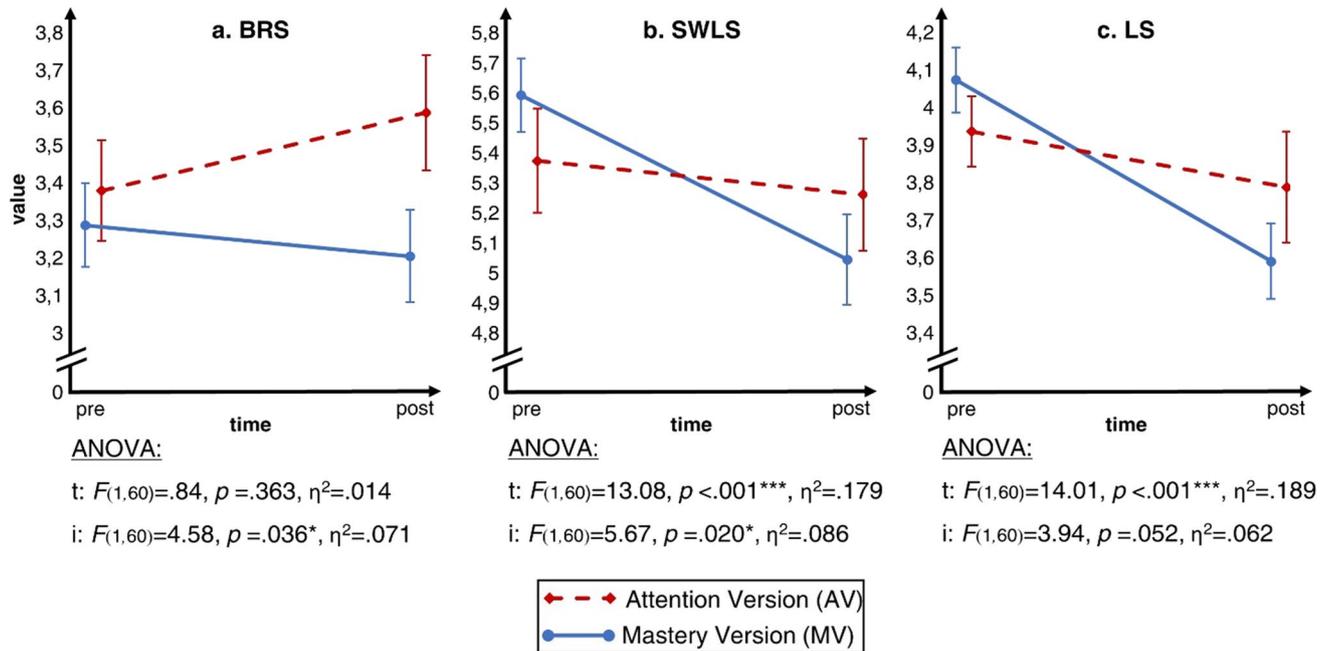


Fig. 2 Change in resilience and life satisfaction of the intervention groups. *t* time, *i* interaction

4 Discussion

4.1 Summary

Descriptive analysis of the journal entries indicated that nearly half of the reported challenges stemmed from challenges related to university, followed by ways of living, social challenges, compatibility, and, lastly, specific COVID-19-related challenges. These challenges were mostly addressed with problem-focused coping strategies. Emotion-focused coping and social coping together accounted for less than a quarter of the coping strategies mentioned.

The results revealed that students who filled out a resilience journal reported significantly more satisfaction (SWLS and LSS) after the intervention, compared to students without any intervention. For resilience, no significant difference was found between students participating in the intervention and those who did not. Hence, Hypothesis 1 can be supported for the effect of the resilience journal on satisfaction, but not for the effect of the intervention on resilience.

When comparing the two versions of the resilience journal in a pre-post-test, a significant effect of the journal version on resilience was found. Using the AV led to a stronger increase in resilience. A strong effect of time on life satisfaction was observed in both journal versions. Life satisfaction decreased over the first 6 weeks of university, but students filling out the AV reported a milder decrease according to the SWLS than did students filling out the MV. Therefore, Hypothesis 2 must be completely rejected, and the opposite of the expected outcome is the case. The AV outperformed the MV in resilience as well as in life satisfaction and was more effective in this study. Further analysis found that dynamic resilience was not significantly influenced by the journal version, but resilience had a positive autoregressive coefficient, indicating that current resilience influences future resilience.

4.2 Interpretation

When looking at the results, the drop in life satisfaction in the two intervention groups highlights the effects of the transition to university and vulnerability during this time [1–4]. The higher satisfaction in participants with an intervention hints at a positive effect from the intervention (especially the AV), but must be treated with caution, because no pre-test data of the control group was available. The longitudinal analysis, as well as the comparison to

the control group, showed that resilience was rather stable over the course of the observed time, but an increase in students filling out the AV was also observed.

This second empirical evaluation of resilience journals clearly favors the AV in fostering students' satisfaction and resilience. The theoretical mechanisms to design the AV were drawn from the broaden-and-build theory, and so theoretical implications arise from this result. As predicted by the theory [49, 50], broadening attention led to increased resilience and the smallest reduction in satisfaction. Solely broadening attention toward challenges, either solved or unsolved, was most effective in supporting first-semester students' mental health in this study. By contrast, the MV, designed to prime resources [51] and give students a sense of mastery [52], produced weaker effects. When comparing the different theoretical considerations, this study implies that it is more important for students to reflect on all their challenges and broaden their attention rather than just learn from success. In the context of this study, the broaden-and-build theory can be recommended as a foundation for resilience interventions. Like the mechanisms of the AV, Seligman [65] proposes that pessimistic beliefs toward adversity can often be resolved if one takes a closer look at them and the evidence for them.

To put this result into a broader context, it is important to look at the challenges and coping strategies students reported in their journals. From the journals, it can be stated that most challenges reflected everyday issues for first-semester students, with nearly half of the challenges stemming from the university context. Challenges resulting from the pandemic represented the smallest number of entries. Thus, the results might have been influenced to some extent by this specific context, however, it seems quite reasonable that they apply to the transition to university in general. The reported coping strategies show that the students used mainly problem-focused strategies and suggest a healthy handling of the challenges. Accordingly, the AV was appropriate for a context in which the students mainly struggled from everyday stressors and coped well. The mechanism of resource priming was proposed by Risch and Wilz [51] in their evaluation of their writing intervention in a sample of patients after psychotherapy. From the current study, we can state that broadening attention to challenges was more effective when dealing with everyday challenges, but when dealing with severe adversity or traumatic experiences, the effectiveness of the two journal versions may be different. Therefore, the two versions of the resilience journal should be further explored in an everyday context as well as in relation to severe adversity.

4.3 Strengths and limitations

This study especially addresses the limitations of the earlier implementation of resilience journals [48]. The 6-week duration of the intervention, the data collection before the first lecture, the recruitment of first-semester students, who are in special need of support [9], the inclusion of a control group without intervention, and the analysis of the journal entries can therefore be seen as strengths of this study. In addition, the data on reduction of life satisfaction during the transition to university and the implications for designing resilience journal interventions toward the broadening of attention are valuable insights to better understand the mechanisms behind writing interventions and use them to support students in the critical transition phase.

Despite these strengths, the study has a limitation regarding its sample. First, the sample was recruited only from the business school of one German university and can thus not be broadened to applications in other contexts. Further research in other universities, study programs, and countries is needed to generalize the findings. Second, the control group represents a convenience sample, and the study did not include a full randomized controlled trial design. The inclusion of the post-test in a first-semester student poll allowed for a larger number of participants in the control group. However, this led to a limitation regarding comparability between students with and without intervention. Students in the control group had no pre-test, and therefore changes in satisfaction and resilience that might have occurred in this group could not be detected. Pre-post-test and randomization between all three groups should be implemented when repeating this study. Third, a minor limitation is the small discrepancy between the calculated 66 participants and the 62 participants that completed the intervention. The discrepancy, however, was not so big that a negative influence on the quality of the results is expected.

Further limitations stem from using only self-report data, lack of generalizability through the special situation during the COVID-19 pandemic, and analyzing qualitative journal entries only on a quantitative level, which does not allow for interpretation of intensity of challenges, but rather the numbers of entries related to certain challenges. Longitudinal analyses also found no differences between the journal versions, which could result from the limited number of measurement points. The effects of the intervention might also be limited by the weekly format of the reflection task. A daily reflection, as used in the intervention by Seligman et al. [47], could possibly provide a higher intensity of reflection

and therefore lead to stronger effects. In addition, other variables such as socioeconomic background, sources for the financing of the study, and part-time student status, could have influenced the transition to university. These variables were not collected in this study, but further research could test the influence of these variables on the effectiveness of the intervention.

4.4 Implications for research and practice

Despite of the aforementioned limitations, implications for research and practice can be drawn. The high effect sizes for the reduction in life satisfaction during the transition to university highlight the importance of supporting students' mental health during their transition. Especially, the high numbers of challenges stemming from the university context highlight the need for support from the universities. Journal interventions can be an important first step to support students and are at the same time cost-efficient, can be delivered online and offline, and are easy to use. This study sheds light on the mechanisms behind journaling interventions and highlights that it is important to include reflection on unsolved challenges to increase resilience. Further research should evaluate the effectiveness of a resilience journal in a larger and more international student sample, and in combination with existing face-to-face resilience interventions. In addition, it is important to further explore the mechanisms of writing interventions and the effects of reflecting on unsolved challenges on resilience to everyday challenges or traumatic adversities outside of the pandemic context.

5 Conclusion

In conclusion, this study found that students in both intervention groups experienced a decline in their life satisfaction during their transition to university. The use of a journal which included a reflection on solved and unsolved challenges was able mitigate this decrease, and to increase resilience. The results show that the transition to higher education is a challenging experience for students and that a resilience journal, designed following the broaden-and-build-theory, can support students during this transition.

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Declarations

Ethics approval and consent to participate All participants gave informed consent to participate in this study. The protocol and questionnaires of this study were approved by the Leadership board of the Area Economic and Business Education of University of Mannheim and was performed in accordance with the ethical standards as laid down in the 1964 Declaration of Helsinki and its later amendments.

Competing interests The authors have no competing interests to declare that are relevant to the content of this article.

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References

1. Briggs A, Clark J, Hall I. Building bridges: understanding student transition to university. *Qual High Educ.* 2012;18:3–21. <https://doi.org/10.1080/13538322.2011.614468>.
2. Fisher S, Hood B. The stress of the transition to university: a longitudinal study of psychological disturbance, absent-mindedness and vulnerability to homesickness. *Br J Psychol.* 1987;78:425–41. <https://doi.org/10.1111/j.2044-8295.1987.tb02260.x>.
3. Hussain R, Guppy M, Robertson S, Temple E. Physical and mental health perspectives of first year undergraduate rural university students. *BMC Public Health.* 2013;13:848. <https://doi.org/10.1186/1471-2458-13-848>.
4. Leary KA, DeRosier ME. Factors promoting positive adaptation and resilience during the transition to college. *Psychology.* 2012;03:1215–22. <https://doi.org/10.4236/psych.2012.312A180>.
5. Timmis MA, Pexton S, Cavallerio F. Student transition into higher education: time for a rethink within the subject of sport and exercise science? *Front Educ.* 2022. <https://doi.org/10.3389/educ.2022.1049672>.
6. Williams H, Roberts N. 'I just think it's really awkward': transitioning to higher education and the implications for student retention. *High Educ.* 2023;85:1125–41. <https://doi.org/10.1007/s10734-022-00881-1>.
7. Herbst U, Voeth M, Eidhoff AT, Müller M, Stief S. Studierendensstress in Deutschland: eine empirische Untersuchung [Students' stress in Germany: an empirical study]. AOK-Bundesverband; 2016. <https://www.fachportal-paedagogik.de/literatur/vollanzeige.html?FId=1108689>
8. Auerbach RP, Mortier P, Bruffaerts R, Alonso J, Benjet C, Cuijpers P, et al. WHO world mental health surveys international college student project: prevalence and distribution of mental disorders. *J Abnorm Psychol.* 2018;127:623–38. <https://doi.org/10.1037/abn0000362>.
9. Copeland WE, McGinnis E, Bai Y, Adams Z, Nardone H, Devadanam V, et al. Impact of COVID-19 pandemic on college student mental health and wellness. *J Am Acad Child Adolesc Psychiatry.* 2021;60:134–41. <https://doi.org/10.1016/j.jaac.2020.08.466>.
10. Essadek A, Rabeyron T. Mental health of French students during the COVID-19 pandemic. *J Affect Disord.* 2020;277:392–3. <https://doi.org/10.1016/j.jad.2020.08.042>.
11. Nöhammer E. Die Wirkungen der Pandemie auf Studierende in Österreich. [The Effects of the Pandemic on Students in Austria]. *Das Gesundheitswesen.* 2022. <https://eref.thieme.de/https://doi.org/10.1055/s-0042-1751150>
12. Tribble DJ, Baldwin A, Nadelson LS. First-year students' perceptions of learning and connection to the university in the coronavirus (COVID-19) pandemic world. *IJHE.* 2022;11:62–79. <https://doi.org/10.5430/ijhe.v11n4p62>.
13. Chirikov I, Soria KM, Horgos B, Jones-White D. Undergraduate and graduate students' mental health during the COVID-19 pandemic: SERU Consortium, University of California - Berkeley and University of Minnesota; 2020. <https://cshe.berkeley.edu/seru-covid-survey-reports>
14. Fruehwirth JC, Biswas S, Perreira KM. The COVID-19 pandemic and mental health of first-year college students: examining the effect of COVID-19 stressors using longitudinal data. *PLoS ONE.* 2021;16: e0247999. <https://doi.org/10.1371/journal.pone.0247999>.
15. Grützmacher J, Gusy B, Lesener T, Sudheimer S, Willige J. Gesundheit Studierender in Deutschland 2017 [Health of university students in Germany 2017]: Ein Kooperationsprojekt zwischen dem Deutschen Zentrum für Hochschul- und Wissenschaftsforschung, der Freien Universität Berlin und der Techniker Krankenkasse; 2018. <https://www.fachportal-paedagogik.de/literatur/vollanzeige.html?FId=1149030>
16. Wang X, Hegde S, Son C, Keller B, Smith A, Sasangohar F. Investigating mental health of US college students during the COVID-19 pandemic: cross-sectional survey study. *J Med Internet Res.* 2020;22: e22817. <https://doi.org/10.2196/22817>.
17. Wathélet M, Duhem S, Vaiva G, Baubet T, Habran E, Veerapa E, et al. Factors associated with mental health disorders among university students in France confined during the COVID-19 pandemic. *JAMA Netw Open.* 2020;3: e2025591. <https://doi.org/10.1001/jamanetworkopen.2020.25591>.
18. Chow SKY, Choi EKY. Assessing the mental health, physical activity levels, and resilience of today's junior college students in self-financing institutions. *Int J Environ Res Public Health.* 2019. <https://doi.org/10.3390/ijerph16173210>.
19. Heublein U, Ebert J, Hutzsch C, Isleib S, König R, Richter J, Woisch A. Motive und Ursachen des Studienabbruchs an baden-württembergischen Hochschulen und beruflicher Verbleib der Studienabbrecherinnen und Studienabbrecher [Motives and causes of dropouts at Baden-Württemberg universities and career retention of dropouts]. *DZHW Projektbericht.* 2017;6/2017. <https://www.fachportal-paedagogik.de/literatur/vollanzeige.html?FId=1126976>
20. Conrad RC, Hahm HC, Koire A, Pinder-Amaker S, Liu CH. College student mental health risks during the COVID-19 pandemic: implications of campus relocation. *J Psychiatr Res.* 2021;136:117–26. <https://doi.org/10.1016/j.jpsychires.2021.01.054>.
21. Grubic N, Badovinac S, Johri AM. Student mental health in the midst of the COVID-19 pandemic: a call for further research and immediate solutions. *Int J Soc Psychiatry.* 2020;66:517–8. <https://doi.org/10.1177/0020764020925108>.
22. Reichel JL, Dietz P, Mülder LM, Werner AM, Heller S, Schäfer M, et al. Predictors of resilience of university students to educational stressors during the COVID-19 pandemic: a longitudinal study in Germany. *Int J Stress Manag.* 2023. <https://doi.org/10.1037/str0000289>.
23. Zajac T, Perales F, Tomaszewski W, Xiang N, Zubrick SR. Student mental health and dropout from higher education: an analysis of Australian administrative data. *High Educ.* 2023. <https://doi.org/10.1007/s10734-023-01009-9>.
24. Idris I, Khairani AZ, Shamsuddin H. The influence of resilience on psychological well-being of Malaysian university undergraduates. *IJHE.* 2019;8:153–63. <https://doi.org/10.5430/ijhe.v8n4p153>.
25. Pidgeon AM, Keye M. Relationship between resilience, mindfulness, and psychological well-being in university students. *Int J Liberal Arts Soc Sci.* 2014;2:27–32. <https://doi.org/10.1080/01460860600677643>.
26. Turner M, Holdsworth S, Scott-Young CM. Resilience at university: the development and testing of a new measure. *High Educ Res Dev.* 2017;36:386–400. <https://doi.org/10.1080/07294360.2016.1185398>.
27. Ayala JC, Manzano G. Academic performance of first-year university students: the influence of resilience and engagement. *High Educ Res Dev.* 2018;37:1321–35. <https://doi.org/10.1080/07294360.2018.1502258>.
28. Bittmann F. When problems just bounce back: about the relation between resilience and academic success in German tertiary education. *SN Soc Sci.* 2021;1:65. <https://doi.org/10.1007/s43545-021-00060-6>.

29. van Breda AD. Resilience of vulnerable students transitioning into a South African university. *High Educ.* 2018;75:1109–24. <https://doi.org/10.1007/s10734-017-0188-z>.
30. Archana, Kumar U, Singh R. Resilience and spirituality as predictors of psychological well-being among university students. *J Psychosoc Res.* 2014;9:277–235.
31. Luthar SS, Cicchetti D, Becker B. The construct of resilience: a critical evaluation and guidelines for future work. *Child Dev.* 2000;71:543–62. <https://doi.org/10.1111/1467-8624.00164>.
32. Fletcher D, Sarkar M. Psychological resilience: a review and critique of definitions, concepts, and theory. *Eur Psychol.* 2013;18:12–23. <https://doi.org/10.1027/1016-9040/a000124>.
33. Linz S, Helmreich I, Kunzler A, Chmitorz A, Lieb K, Kubiak T. Interventionen zur Resilienzförderung bei Erwachsenen - Eine narrative Übersichtsarbeit [Interventions to promote resilience in adults—a narrative review]. *Psychother Psychosom Med Psychol.* 2020;70:11–21. <https://doi.org/10.1055/a-0830-4745>.
34. Galante J, Dufour G, Vainre M, Wagner AP, Stochl J, Benton A, et al. A mindfulness-based intervention to increase resilience to stress in university students (The Mindful Student Study): a pragmatic randomised controlled trial. *Lancet Public Health.* 2018;3:e72–81. [https://doi.org/10.1016/S2468-2667\(17\)30231-1](https://doi.org/10.1016/S2468-2667(17)30231-1).
35. Hill E, Posey T, Gómez E, Shapiro SL. Student readiness: Examining the impact of a university outdoor orientation program. *J Outdoor Recreation Educ Leadership.* 2018;10:109–23. <https://doi.org/10.18666/JOREL-2018-V10-I2-7184>.
36. Kadian S, Joseph J, Pal S, Devi R. Brief resilience interventions for mental health among college students: randomized controlled trial. *Asian J Soc Health Behav.* 2022;5:131–7. https://doi.org/10.4103/shb.shb_28_22.
37. Akeman E, Kirlic N, Clausen AN, Cosgrove KT, McDermott TJ, Cromer LD, et al. A pragmatic clinical trial examining the impact of a resilience program on college student mental health. *Depress Anxiety.* 2020;37:202–13. <https://doi.org/10.1002/da.22969>.
38. Houston JB, First J, Spialek ML, Sorenson ME, Mills-Sandoval T, Lockett M, et al. Randomized controlled trial of the resilience and coping intervention (rci) with undergraduate university students. *J Am Coll Health.* 2017;65:1–9. <https://doi.org/10.1080/07448481.2016.1227826>.
39. Steinhardt M, Dolbier C. Evaluation of a resilience intervention to enhance coping strategies and protective factors and decrease symptomatology. *J Am Coll Health.* 2008;56:445–53. <https://doi.org/10.3200/jach.56.44.445-454>.
40. Brewer ML, van Kessel G, Sanderson B, Naumann F, Lane M, Reubenson A, Carter A. Resilience in higher education students: a scoping review. *High Educ Res Dev.* 2019;38:1105–20. <https://doi.org/10.1080/07294360.2019.1626810>.
41. Chmitorz A, Kunzler A, Helmreich I, Tüscher O, Kalisch R, Kubiak T, et al. Intervention studies to foster resilience—a systematic review and proposal for a resilience framework in future intervention studies. *Clin Psychol Rev.* 2018;59:78–100. <https://doi.org/10.1016/j.cpr.2017.11.002>.
42. Joyce S, Shand F, Tighe J, Laurent SJ, Bryant RA, Harvey SB. Road to resilience: a systematic review and meta-analysis of resilience training programmes and interventions. *BMJ Open.* 2018;8: e017858. <https://doi.org/10.1136/bmjopen-2017-017858>.
43. Robertson IT, Cooper CL, Sarkar M, Curran T. Resilience training in the workplace from 2003 to 2014: a systematic review. *J Occup Organ Psychol.* 2015;88:533–62. <https://doi.org/10.1111/joop.12120>.
44. Scheuch I, Peters N, Lohner MS, Muss C, Aprea C, Fürstenau B. Resilience training programs in organizational contexts: a scoping review. *Front Psychol.* 2021;12:733036. <https://doi.org/10.3389/fpsyg.2021.733036>
45. Price RA. A review of resilience in higher education: toward the emerging concept of designer resilience. *Stud High Educ.* 2023;48:83–99. <https://doi.org/10.1080/03075079.2022.2112027>.
46. Emmons RA, McCullough ME. Counting blessings versus burdens: an experimental investigation of gratitude and subjective well-being in daily life. *J Pers Soc Psychol.* 2003;84:377–89. <https://doi.org/10.1037/0022-3514.84.2.377>.
47. Seligman ME, Steen TA, Park N, Peterson C. Positive psychology progress: empirical validation of interventions. *Am Psychol.* 2005;60:410–21. <https://doi.org/10.1037/0003-066X.60.5.410>.
48. Lohner MS, Aprea C. The resilience journal: exploring the potential of journal interventions to promote resilience in university students. *Front Psychol.* 2021;12:702683. <https://doi.org/10.3389/fpsyg.2021.702683>.
49. Fredrickson BL. The role of positive emotions in positive psychology: the broaden-and-build theory of positive emotions. *Am Psychol.* 2001;56:218–26. <https://doi.org/10.1037/0003-066X.56.3.218>.
50. Conway AM, Tugade MM, Catalano LI, Fredrickson BL. The broaden-and-build theory of positive emotions: form, function and mechanisms. In: David S, Boniwell I, Ayers ACA, editors. *Oxford Handbook of Happiness*. Oxford: Oxford University Press; 2013. p. 17–34. <https://doi.org/10.1093/oxfordhb/9780199557257.013.0003>.
51. Risch AK, Wilz G. Ressourcentagebuch: Verbesserung der Emotionsregulation und der Ressourcenrealisierung durch therapeutisches Schreiben im Anschluss an eine Psychotherapie. [Resource journal: Improving emotion regulation and resource realization through therapeutic writing following psychotherapy]. *Zeitschrift für Klinische Psychologie und Psychotherapie.* 2013;42:1–13. <https://doi.org/10.1026/1616-3443/a000181>
52. Wing JF, Schutte NS, Byrne B. The effect of positive writing on emotional intelligence and life satisfaction. *J Clin Psychol.* 2006;62:1291–302. <https://doi.org/10.1002/jclp.20292>.
53. Reiter C, Wilz G. Resource diary: a positive writing intervention for promoting well-being and preventing depression in adolescence. *J Posit Psychol.* 2016;11:99–108. <https://doi.org/10.1080/17439760.2015.1025423>.
54. Davis DE, Choe E, Meyers J, Wade N, Varjas K, Gifford A, et al. Thankful for the little things: a meta-analysis of gratitude interventions. *J Couns Psychol.* 2016;63:20–31. <https://doi.org/10.1037/cou0000107>.
55. DuPont CM, Pressman SD, Reed RG, Manuck SB, Marsland AL, Gianaros PJ. Does an online positive psychological intervention improve positive affect in young adults during the COVID-19 pandemic? *Affect Sci.* 2023;4:101–17. <https://doi.org/10.1007/s42761-022-00148-z>.
56. Smith BW, Dalen J, Wiggins K, Tooley E, Christopher P, Bernard J. The brief resilience scale: assessing the ability to bounce back. *Int J Behav Med.* 2008;15:194–200. <https://doi.org/10.1080/1070550080222972>.
57. Chmitorz A, Wenzel M, Stieglitz R-D, Kunzler A, Bagusat C, Helmreich I, et al. Population-based validation of a german version of the brief resilience scale. *PLoS ONE.* 2018;13: e0192761. <https://doi.org/10.1371/journal.pone.0192761>.

58. Köhne S, Engert V, Rosendahl J. Stability of resilience in times of the COVID-19 pandemic. *Personal Ment Health*. 2022. <https://doi.org/10.1002/pmh.1560>.
59. Diener E, Emmons RA, Larsen RJ, Griffin S. The satisfaction with life scale. *J Personality Assess*. 1985;49:71–5. https://doi.org/10.1207/s15327752jpa4901_13.
60. Glaesmer H, Grande G, Braehler E, Roth M. The German Version of the Satisfaction With Life Scale (SWLS). *Eur J Psychol Assess*. 2011;27:127–32. <https://doi.org/10.1027/1015-5759/a000058>.
61. Holm-Hadulla RM, Hofmann FH. Einfluss von Beratung auf Symptombelastung und Lebens- und Studienzufriedenheit [Influence of counseling on symptom burden and life and study satisfaction]. In: Conference proceedings of the symposium consulting; 2007. p. 205–16.
62. Hofmann FH. . Kreativität und Krise: Zum Zusammenhang von psychischer Beeinträchtigung und Kreativität [Creativity and crisis: On the relationship between psychological impairment and creativity]. Doctoral dissertation, Heidelberg University; 2010. http://archiv.ub.uni-heidelberg.de/volltextserver/11562/1/Dissertation_Hofmann_Veroeffentlichung.pdf
63. Mayring P. *Qualitative Inhaltsanalyse: Grundlagen und Techniken*. [Qualitative content analysis: Basics and techniques]. 12th ed. Weinheim/Basel: Beltz; 2015.
64. Smith M. What is the Relationship Between Quality of Life and Coping Strategies of Adults with Celiac Disease Adhering to a Gluten Free Diet? Doctoral dissertation, Duquesne University; 2009. <https://dsc.duq.edu/etd/1214>
65. Seligman ME. *Authentic happiness*. Nicholas Brealey Publishing; 2017.

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