Article

Personal Growth under Stress: Mediating Effects of Unit Cohesion and Leadership during Mandatory Military Training

Svajone Bekesiene [ID] and Rasa Smaliukiene *[ID]

General Jonas Zemaitis Military Academy of Lithuania, LT-10322 Vilnius, Lithuania
* Correspondence: rasa.smaliukiene@lka.lt

Abstract: This study explores the phenomena of personal growth under stress and investigates the mediating effect of leadership and four elements of group cohesion (social, task, norm, and psychological). Data were collected at the beginning and end of mandatory military training in two units ($n = 184$), where the first unit was redeployed (transferred from one location to another) in the middle of the training period, and the second remained in the same physical place throughout the training period. Unit leadership and cohesion were found to mitigate the negative effect of perceived stress on personal growth; however, this effect depends on the phases of group dynamics. The modeling of structural equations revealed that social cohesion is a particularly important mediator (impact 71%) in reducing the negative impact of perceived stress on personal growth in a unit without redeployment. Meanwhile, leadership is an important mitigator when a group is in formation (at the beginning of mandatory military training, leadership mediates 15–18% of effects), as well as in the unit where the bonds between group members are weak due to physical disturbance while redeploying the unit to a new location (at the end of service, the effect of leadership is 38% in the redeployed unit). We conclude that leadership can replace a lack of social cohesion in a group with weak ties between group members and reduce the negative effect of perceived stress on personal growth. This is a new insight that allows social cohesion and leadership to be seen not only as complementary factors in group dynamics, but also as substitutes.

Keywords: group cohesion; leadership; perceived stress; personal growth; military training; conscripts; structural equation modeling

1. Introduction

1.1. Topic Importance

A stimulating environment in which sustainable social and emotional learning takes place is important for personal growth. Mandatory military training is indeed a case where considerable effort is put into stimulating mental fitness and resilience that leads to personal growth. According to Loo, this training is the passage that takes 'males from boyhood to manhood' [1]. Civilians (predominantly men) called up for military training learn to be soldiers. They learn to act as an integral part of a small unit (team) and perform physically and mentally demanding tasks in an artificially created combat stress environment. According to Kimhi [2] findings, this is a period of maturation and personal growth. Although this period of service in the military is agreed to lead to personal growth, it is also a mentally [3,4] and physically [4] tense period in which conscripts experience stress. Personal growth in a stressful environment is a phenomenon that requires exploration.

Two factors of military service are attributed to personal growth and stress mitigation: unit leadership and unit cohesion. The dominant view in military practice and doctrine is that unit leadership is a key determinant of solder development, including individual skills such as physical endurance, resilience to stress, and rapid reaction [5], as well as social abilities to work in a team and under command [6]. However, research also shows

that not only leadership, but team cohesion creates a unique environment that can be conducive to personal development [7,8]. In general, psychologists pay close attention to personal growth in groups, and research results show exceptionally positive results of group cohesion in personal growth [9]. To understand how unit leadership and unit cohesion work in the military, we provide a brief overview of these two concepts.

The leadership of small units is manifested while preparing soldiers as a unit for tasks and leading them while performing the tasks [10]. During peacetime in the military in general and during military conscription training in particular, leadership is about mentoring and coaching unit solders individually and as a team [11]. In studies with a variety of activity groups, including the military, leadership has been associated with personal growth of followers. Leadership has been found to be positively related to psychological state [9], leading to self-efficacy and resilience [10–12]. In addition, leadership is considered important due to the sensitive effect on the end-state competencies of followers [13–15]. In the military, this is associated with transformational leadership theory and its application. Avolio, who is pioneering the theory of transformational leadership, argues that transformational military leaders influence development and raise empowerment among followers [16]. Furthermore, a transformational leader motivates followers to act beyond expectations so that followers trust their abilities and practice new skills [17]. All of this has a positive effect on personal growth. Furthermore, following the systematic review by Brooks [17], it is concluded that leadership is negatively associated with stress and strain, and according to Hoyt and Repke [18] it is even more, as the role of small unit leadership is found to be critical in managing solders with a high level of perceived stress. In this sense, the *question to be explored is where leadership in mandatory military training shows a positive effect on the development of solder personal growth despite their perceived stress of adapting to the new military environment, leading tough tasks and exercises during military training*.

Unit cohesion in the military is evidenced by social identity, and a person is categorized as a group member. Based on Bartone et al. [19], unit cohesion is the combined effects of members experiencing personal attraction to each other and performing a stressful task together. Thus, the common experience increases unit cohesion [20]. Multiple studies supported the positive effect of unit cohesion on individual stress responses, as well as on individual-level performance. Gilbar et al. [21] argue that in the unit, cohesion reinforces self-identity and helps achieve personal goals. Four elements of group cohesion are found to be important: (1) social cohesion, (2) task cohesion, (3) norm cohesion, and (4) psychological cohesion. [7,22–24]. Social cohesion represents the individual's attraction to the group, task cohesion indicates how focused the unit is on task completion, norm cohesion is about how norms internalize among unit members, and finally psychological cohesion is about the psychological climate in a unit. What is more important, unit cohesion as a whole grows over time, and the level of cohesiveness strengths throughout the entire life span of a group. Consequently, the *question to be explored is where unit cohesiveness has an effect on personal growth throughout the period of compulsory military training*, which in European countries varies from 6 to 24 months [25] and in Lithuania lasts 9 months.

1.2. Hypothesis Development

To answer the research questions, a research framework was developed. Conceptually, it is expected that perceived stress has a negative effect on personal growth. Therefore:

Hypothesis 1 (H1). *Perceived stress has a negative effect on personal growth during mandatory military training.*

Additionally, unit leadership and unit cohesion are expected to have a mediating effect between perceived stress and personal growth during mandatory military training. More specifically, these two mediators are expected to have an attenuating effect and reduce the negative effects of perceived stress on personal growth. Therefore, we develop the following hypotheses (Figure 1):
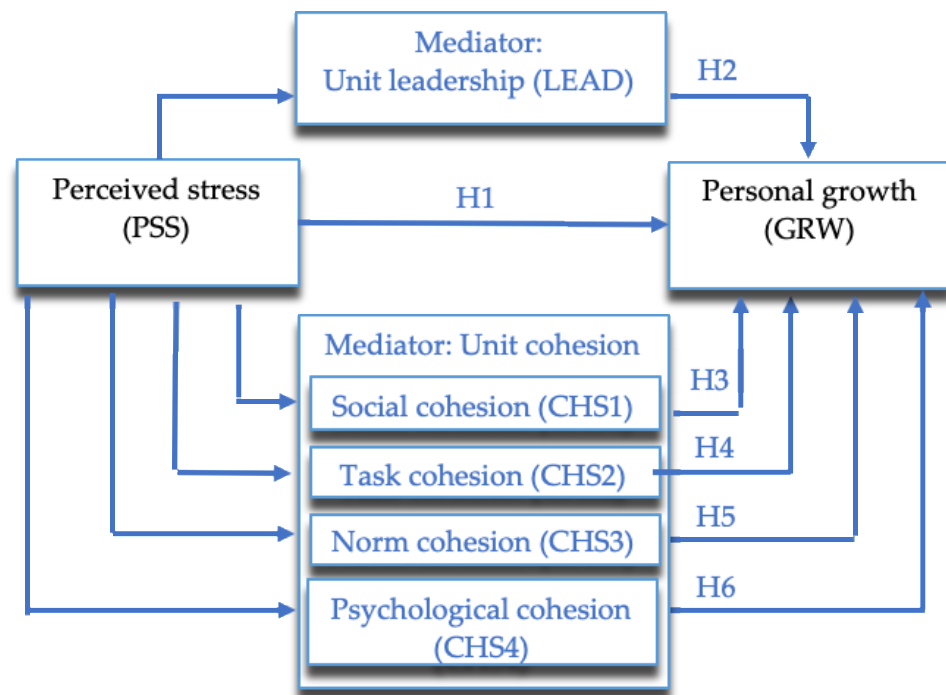
Figure 1. The mediating effect of unit leadership and unit cohesion between perceived stress and personal growth during mandatory military training.

Hypothesis 2 (H2). *Unit leadership mediates the indirect relationship between perceived stress and personal growth during mandatory military training;*

Hypothesis 3 (H3). *Social cohesion mediates the indirect relationship between perceived stress and personal growth during mandatory military training;*

Hypothesis 4 (H4). *Task cohesion mediates the indirect relationship between perceived stress and personal growth during mandatory military training;*

Hypothesis 5 (H5). *Norm cohesion mediates the indirect relationship between perceived stress and personal growth during mandatory military training;*

Hypothesis 6 (H6). *Psychological cohesion mediates the indirect relationship between perceived stress and personal growth during mandatory military training.*

Given the strong emphasis on leadership in military training [26–28], we hypothesize that:

Hypothesis 7 (H7). *Unit leadership can replace a lack of cohesion in conscript groups while mediating the effect of perceived stress on personal growth.*

This conceptual framework represents a classical view on personal growth in which the immediate environment (group) has an important corrective effect on perceived stress and personal growth. However, following previous studies [29,30], external factors also play an important role. Considering that personal growth in a group depends not only on internal group factors but also on external environmental factors, we expanded our study and introduced an additional variable, environmental stability. We conducted our research in two military battalions, where the first was redeployed (transferred from one location to another) in the middle of the training period, and the second remained in the same physical

place throughout the training period. Redeployment, as a significant stress factor, was identified in previous military studies [31,32]. Accordingly, we hypothesize that:

Hypothesis 8 (H8). *The impact of leadership and group cohesion as mediators is different in the units that remained in the same physical place throughout the training period and the redeployed units.*

The purpose of this study was to explore what mediating effect unit leadership and four elements of unit cohesion (social, task, norm, and psychological) have on perceived stress and personal growth during mandatory military training. The findings explain how personal growth takes place under stress in stable and changed environments, where one part of the research participants remained in the same physical location and the other part was redeployed. In this way, our findings contribute to increasing knowledge about the complex phenomenon of personal growth under stress. To our knowledge, it is the first study to explore this phenomenon during mandatory military training. Repeated measures on conscripts from two Lithuanian military battalions were used to compare how leadership and cohesion mediate the link between perceived stress and personal growth at the beginning and at the end of mandatory military training.

2. Materials and Methods

2.1. Participants

The research was part of a systematic longitudinal study on stress management during mandatory military training [23,33–35]. A total of 184 conscripts in two military units aged 18–26 years participated in this study from the first to the last month of training, 9 months in total. As can be seen in Appendix A, male average 20 years dominated this sample because only young men's military service is compulsory in Lithuania; various educational and other demographic categories were presented among the sample of participants. The study received ethical approval from the Vilnius Regional Biomedical Research Ethics Committee, Lithuania.

2.2. Procedures and Measures

The Lithuanian version of the perceived stress scale (PSS) has been used to assess the level of perceived stress at the beginning and at the end of mandatory military service. The scale developed by Cohen et al. [36] and based on 10 items is widely used in psychological studies in different fields, including military (see Chen et al. [37] and Ali et al. [38] for the latest application). The scale indicates three levels of stress: low stress levels (with a score between 0 and 13), moderate stress levels (between 14 and 26), and high stress levels (between 27 and 40) [36]. The classic version of the PSS scale covers stress levels over a one-month period, in our study representing the first (T1) and the last (T2) months of training.

Personal growth (GROW) was measured using a list of items that measured overall positive change (e.g., 'I have learned new things about myself during conscript service') and specific qualities: teamwork; responsibility for oneself and others; contribution; tolerance for otherness; discipline, etc. (e.g., 'Due to military service I can take other people in to consideration as well'). Four items of personal growth were selected and translated from the Salo questionnaire [35].

Unit leadership (LEAD) was measured using the attitude toward supervisory leadership. It is a common method for evaluating small group leadership [39,40]. To measure unit leadership, the six items were translated from the Salo and Siebold [41] questionnaire.

Unit cohesion was measured using four types of cohesion: social cohesion (CHS1), task cohesion (CHS2), norm cohesion (CHS3), and psychological cohesion (CHS4). The questionnaire was developed using the revised Group Cohesion Scale [41,42], the Team Learning Behavior Scale in the Joint Staff Exercise Combined (CJSE) [43], and the Con-

script Adjustment and Attrition Questionnaire [44]. In total, unit cohesion was measured using 33 items.

2.3. Methodology of Statistical Analyses

The analysis had two parallel objectives: (a) to estimate the change over time in perceived stress and mediating factors and (b) to assess the mitigating effect of mediators on the effects of perceived stress on personal growth (PSS $\Rightarrow$ GRW). Two-stage modelling was performed to evaluate the two predefined objectives chosen in this study. For the estimation of this full model with multilevel and individual longitudinal growth models and categorical results, AMOS 26v and SPSS 27.0 v were used in a complementary manner.

First, we estimate the change over time. General constructs (except the personal growth score) such as perceived stress, unit leadership, social cohesion, task cohesion, norm cohesion, and psychological cohesion were measured twice to illustrate the increase or decrease over time. The first set of analysis focused on the initial estimates of variation in the two follow-up assessments (T1—at the beginning of service and T2—at the end of service) for each of the mediating constructs and for perceived stress. Change over time was examined with the paired Student's *t*-test, which was applied to establish differences in unit cohesion, perceived stress, and unit leadership assessment. The paired-samples *t*-test was used to evaluate the average difference between the paired samples means and the standard deviation of the average difference score of six variables by estimating: (1) the standard error mean as index of the variability in repeated random samples; (2) the true mean difference in the 95% confidence interval of the difference of all possible random samples used in this study; (3) the significance (two-tailed) as probability of obtaining a t-statistic where the absolute value is equal or greater than the obtained t-statistic. We follow Cohen's [45] d values to rate the effects of differences, and used such a rank scale as: unimportant if the value is <0.20, small if the value is in [0.20–0.50], moderate if [0.51–0.80] and large effects in differences if the value is greater than 0.80. Correlation analysis was used to estimate the relationship between variables constructed from self-reported data. These relationships were determined using the Pearson's correlation coefficient (r), which was classified from trivial (value < 0.1) to very strong (value $\in$ [0.7–0.9]) and almost perfect (value > 0.9) [46]. Second, we analyzed the repeated measures of chosen variables according the environmental stability, i.e., we measured if Unit 1 is different form Unit 2, where Unit 1 was redeployed in a different location, while Unit 2 remained at the same place throughout the entire training period. For this purpose, we used a two-way ANOVA with repeated measures (unit $\times$ time), and for effect size assessment we focused on partial eta-squared (ηp^2) measures [47].

The final step was to evaluate the mediating effects. The variables presented in Table 1 were included to estimate the multiple mediation models. The designed path models tested the direct effect of perceived stress (PSS) on personal growth (GROW) and the indirect (mediated) effect caused by unit cohesion (CHS1, CHS2, CHS3, and CHS4) and unit leadership (LEAD) following the methodology for multiple mediator models [48]. Specific indirect effects were estimated as the product of the path from cause slope to mediator slope and the path from mediator slope to outcome. The direct impact of unit cohesion and unit leadership on personal growth (outcome) was also estimated.

Table 1. Variables used in the research.

Variable	Code	Measurement	Cronbach's Alpha [5]
Perceived stress [1]	PSS	10-items about the respondent's feelings and thoughts over the past month on 5-point Likert scale (0—never to 4—very often)	0.853 (T1) 0.885 (T2)
Personal growth [2]	GROW	4 items about improved abilities on 7-point Likert scale	0.859 (T2)
Unit leadership [3]	LEAD	8 items on the attitude of subordinates toward supervisory leadership on the 7-point Likert scale	0.899 (T1) 0.899 (T2)
Unit cohesion:			
Social cohesion [4]	CHS1	12 items on social cohesion in a unit on a 7-point Likert scale	0.872 (T1) 0.928 (T2)
Task cohesion [4]	CHS2	8 items on task cohesion in a unit on 7-point Likert scale	0.779 (T1) 0.830 (T2)
Norm cohesion [4]	CHS3	6-items on norm cohesion in a unit on 7-point Likert scale	0.869 (T1) 0.8904 (T2)
Psychological cohesion [4]	CHS4	7 items on psychological cohesion on a 7-point Likert scale	0.890 (T1) 0.925 (T2)

Notes: [1] Standardized Cohen's 10-item Perceived Stress Scale based on a 5-point scale; [2] Conscripts Adjustment and Attrition questionnaire; [3] Conscript Squad Leader questionnaire; [4] Group Cohesion Scale-Revised, the Scale of Team Learning Behaviour in the Combined Joint Staff Exercise and Conscripts Adjustment and Attrition questionnaire; [5] Cronbach's alpha for repeated measures: T1—at the beginning of service, T2—at the end of service.

3. Results

3.1. Descriptive and Pearson's Correlation Results

We started our data analysis with descriptive statistics and relationship assessment using Pearson's correlation. Detailed results are presented in Table 2.

Table 2. Descriptive statistics and Pearson correlations between study variables.

Construct	M	SD	1	2	3	4	5	6	7
				T1—at the beginning of service					
PSS (1)	1.73	0.771	-						
GROW (2)	5.39	1.360	−0.233 **	-					
LEAD (3)	5.91	1.260	−0.411 **	0.339 **	-				
CHS1 (4)	5.16	1.117	−0.345 **	0.405 **	0.422 **	-			
CHS2(5)	4.87	0.926	−0.418 **	0.375 **	0.469 **	0.728 **	-		
CHS3 (6)	5.29	1.320	−0.454 **	0.262 **	0.328 **	0.600 **	0.545 **	-	
CHS4 (7)	2.29	1.202	−0.440 **	−0.207 **	−0.415 **	−0.532 **	−0.550 **	−0.693 **	-
				T2—at the end of service					
PSS (1)	1.61	0.730	-						
GROW (2)	5.39	1.360	−0.304 **	-					
LEAD (3)	5.48	1.375	−0.358 **	0.511 **	-				
CHS1 (4)	4.80	1.350	−0.461 **	0.644 **	0.510 **	-			
CHS2(5)	4.78	1.124	−0.539 **	0.528 **	0.492 **	0.799 **	-		
CHS3 (6)	5.14	1.455	−0.495 **	0.520 **	0.378 **	0.762 **	0.681 **	-	
CHS4 (7)	5.41	1.385	−0.550 **	0.407 **	0.386 **	0.584 **	0.643 **	0.636**	-

Notes: ** The correlation is significant at the 0.01 level (two-tailed).

Specifically, personal growth (GROW) was positively and moderately associated with social cohesion (GROW and CHS1, r = 0.405, *p* < 0.01) and unit leadership (GROW and LEAD, r = 0.339, *p* < 0.01) at the beginning of service (T1), and positively and strongly associated with social cohesion (GROW and CHS1, r = 0.644, *p* < 0.01) and unit leadership (GROW and LEAD, r = 0.511, *p* < 0.01) at the end of service (T2). Consequently, a positive and strong relationship was also observed between social cohesion and task cohesion

(CHS1and CHS2, at T1: r = 0.728, *p* < 0.01; at T2: r = 0.799, *p* < 0.01). Furthermore, perceived stress was negatively and moderately correlated with all unit cohesion variables at the beginning of service (T1). Furthermore, perceived stress was negatively and strongly correlated with psychological cohesion (r = −0.550, *p* < 0.01) at the end of the service.

3.2. Statistical Differences between Smaples

To find out if there are statistically significant differences between two perceived stress measurements (PSS), unit cohesion (CHS1, CHS2, CHS3, and CHS4) and unit leadership (LEAD), a paired sample *t*-test was performed and differences of a repeated measurement of T1 (at the beginning of the training period) and T2 (at the end of it) were assessed. The results of the paired sample *t*-test are presented in Table 3.

Table 3. Paired sample *t*-test for assessment of paired differences.

	Paired Samples	Mean	SD	Std. Error Mean	Difference by 95% CI		*t*-Statistics	df	Sig. (2-Tailed)	Cohen's d (Effect Rating)
					Lower	Upper				
Pair 1:	PSS(T1)–PSS(T2)	0.108	0.837	0.065	−0.020	0.236	1.659	165	0.099	0.129 (trivial)
Pair 2:	LEAD(T1)–LEAD(T2)	0.449	1.430	0.111	0.230	0.668	4.043	165	0.000	0.314 (small)
Pair 3:	CHS1(T1)–CHS1(T2)	0.384	1.267	0.098	0.189	0.578	3.900	165	0.000	0.303 (small)
Pair 4:	CHS2(T1)–CHS2(T2)	0.092	1.176	0.091	−0.088	0.272	1.012	166	0.313	0.078 (trivial)
Pair 5:	CHS3(T1)–CHS3(T2)	0.182	1.570	0.122	−0.059	0.422	1.491	165	0.138	0.116 (trivial)
Pair 6:	CHS4(T1)–CHS4(T2)	−3.111	2.307	0.179	−3.465	−2.757	−17.371	165	0.000	−1.348 (large)

Notes: SD = Std. deviation; 95% CI = 95% confidence interval.

The results of the paired samples *t*-test indicated that task cohesion (CHS2), norm cohesion (CHS3) and perceived stress (PSS) at the beginning of the training period (T1) and at the end (T2) did not reveal any significant changes (Pair 1: *p* = 0.099, d = 0.129; Pair 4: *p* = 0.313, d = 0.078; Pair 5: *p* = 0.138, d = 0.116, see Table 3). However, significant changes were detected when comparing unit leadership (Pair 2: *p* = 0.000, d = 0.314, see Table 3), social cohesion (Pair 3: *p* = 0.000, d = 0.303, see Table 3) and psychological cohesion (Pair 6: *p* = 0.000, d= −1.348, see Table 3) at the beginning of the training period (T1) and its end (T2).

Additionally, the factor of environmental stability was evaluated (Table 4). We analyzed the differences between two samples, Unit 1 (deployed in one place) and Unit 2 (redeployed), in our independent variables: perceived stress (PSS), unit cohesion (CHS1, CHS2, CHS3 and CHS4) and unit leadership (LEAD). Subsequently, Pillai's Trace (PT) was used as a test of a multivariate outcome in each independent variable and for the interaction between these independent variables. The two-way ANOVA with repeated measures analysis showed that there is no significant multivariate effect between subjects in Unit1 and Unit2 (regardless of time point): PT= 0.045, F (6, 158) = 1.248, *p*= 0.285 (PT is Pillai's Trace result). The significant multivariate effect across was identified within subject time points (regardless of unit): PT= 0.696, F (6, 158) = 60.288, *p*= 0.000. We also identify a significant multivariate effect across the interaction between units and time points: PT = 0.081, F (6, 158) = 2.333, *p*= 0.035. These findings lead to a future analysis in which we focus on the effects of mediation in estimating personal growth (GROW).

Table 4. Multivariate test [a,b] results by Pillai's Trace.

| Effect by Pillai's Trace		Value	F	Hypothesis df	Error df	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power [d]
Between Subjects	Intercept	0.992	3461.464 [c]	6.000	158	0.000	0.992	20768.786	1.000
	Group	0.045	1.248 [c]	6.000	158	0.285	0.045	7.488	0.481
Within Subjects	Time	0.696	60.288 [c]	6.000	158	0.000	0.696	361.726	1.000
	Time * Group	0.081	2.333 [c]	6.000	158	0.035	0.081	13.996	0.794

Notes: [a] Design: Intercept + Group, Within Subject Design: Time; [b] Tests are based on averaged variables; [c] Exact statistic; [d] Computed using alpha = 0.05.

3.3. Results of the Parallel Mediation Modeling

We designed and confirmed parallel mediation models to investigate the effect of perceived stress (PSS) on personal growth (GROW) at two time points and among two independent samples. All models were designed with five indirect effects on personal growth (GROW), such as (1) perceived stress (PSS) through social cohesion (CHS1), (2) perceived stress (PSS) through task cohesion CHS2, (3) perceived stress (PSS) through norm cohesion (CHS3), (4) perceived stress (PSS) through psychological cohesion (CHS4), and (5) perceived stress (PSS) through unit leadership (LEAD).

3.3.1. The Impact of the Beginning of the Training Period on Personal Growth

At the beginning of the training period (T1), two units (Unit 1 and Unit 2) look similar in terms of the moderating factors and their mitigating effect between perceived stress and personal growth. The modelling results are presented in Figure 2, where part a is for Unit 1 and part b is for Unit 2.

(a)　　　　　　　　　　　　　　　　　　　　　　　　　　(b)
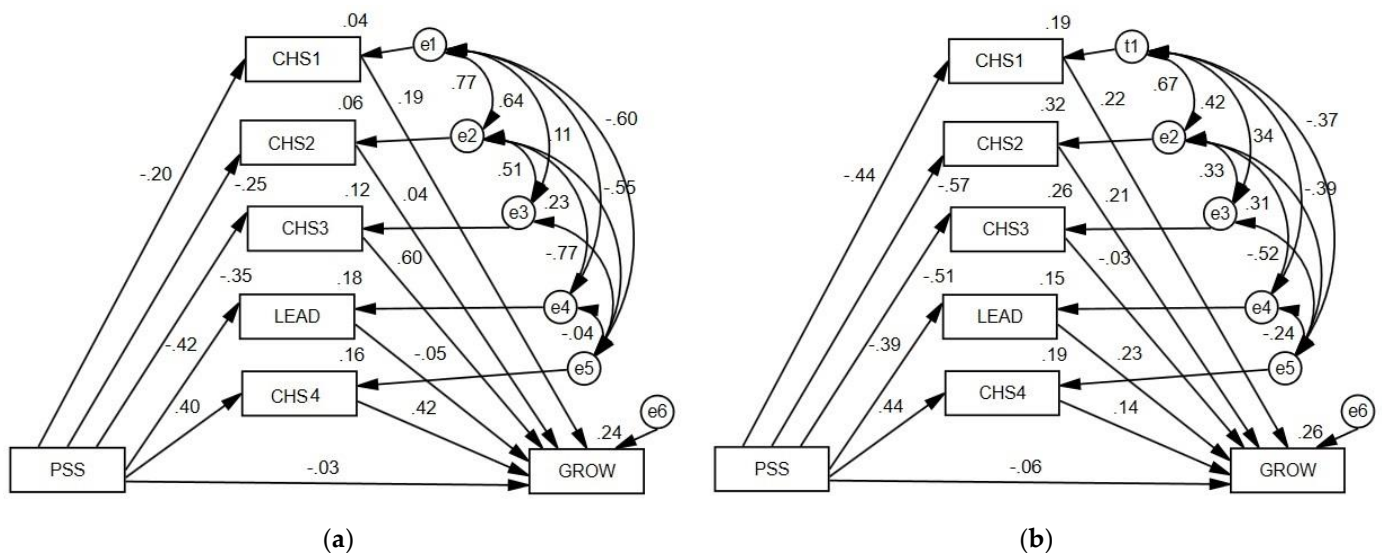
Figure 2. Parallel mediation models designed for the evaluation of personal growth (GROW). Notes: (χ^2 = 8.707 df = 2, p = 0.13], CFI = 0.984, NFI = 0. 986, a TLI = 0.918, RMSEA = 0.059 and PCLOSE = 0.052) to explain the indirect relationship between perceived stress (PSS) and five constructs (unit cohesion: CHS1, CHS2, CHS3, CHS4, and unit leadership (LEAD)). Standardized path coefficients are presented as near arrows and show the effects of perceived stress, unit cohesion, and unit leadership on personal growth at the beginning of the training period (T1). Regression coefficients were obtained after controlling for the conscription area: (**a**) Model Unit 1 (N = 72); (**b**) Model Unit 2 (N = 112).

After controlling for the effect of redeployment, the results of parallel mediation at the beginning of the training period (T1) are shown in Figure 2.

Perceived stress had only a positive effect on psychological cohesion (CHS4), standardized β= 0.400, t = 3.427, p < 0.001 (for conscripts in Unit 1) and standardized β = 0.441, t = 5.146, p < 0.001 (Unit 2; T1). The negative effect was found on social cohesion (CHS1, UNIT1_T1: β = −0.203, t = −1.634, p =0.102; UNIT2_T1: β = −0.436, t = −5.073, p < 0.001); task cohesion (CHS2, UNIT1_T1: β = −0.245, t = −1.999, p = 0.046; UNIT2_T1: β = −0.565, t = −7.179, p < 0.001); norm cohesion (CHS3, UNIT1_T1: β = −0.353, t = −2.965, p = 0.003; UNIT2_T1: β = −0.510, t = −6.209, p < 0.001); and unit leadership (LEAD, UNIT1_T1: β = −0.425, t = −3.677, p < 0.001; UNIT2_T1: β = −0.389, t = −4.423, p < 0.001) (see Figure 2 and Table 5).

Table 5. Standardized regression weight at the beginning of the training period (T1).

Path Directions			Model Unit1_T1				Model Unit2_T1			
			[a] Estimate (β)	S.E.	C.R.	*p*	[a] Estimate (β)	S.E.	C.R.	*p*
CHS1	<—	PSS	−0.203	0.213	−1.634	0.102	−0.436	0.118	−5.073	***
CHS2	<—	PSS	−0.245	0.143	−1.999	0.046	−0.565	0.095	−7.179	***
CHS3	<—	PSS	−0.353	0.205	−2.965	0.003	−0.510	0.146	−6.209	***
LEAD	<—	PSS	−0.425	0.164	−3.677	***	−0.389	0.156	−4.423	***
CHS4	<—	PSS	0.400	0.177	3.427	***	0.441	0.138	5.146	***
GROW	<—	CHS1	0.191	0.148	0.940	0.347	0.223	0.199	1.661	0.097
GROW	<—	PSS	−0.031	0.169	−0.231	0.817	−0.055	0.223	−0.504	0.615
GROW	<—	CHS2	0.039	0.204	0.204	0.839	0.209	0.236	1.503	0.133
GROW	<—	CHS3	0.599	0.148	2.909	0.004	−0.027	0.141	−0.223	0.824
GROW	<—	CHS4	0.417	0.167	2.039	0.041	0.136	0.147	1.169	0.242
GROW	<—	LEAD	−0.054	0.114	−0.411	0.681	0.233	0.116	2.304	0.021

Notes: PSS = perceived stress; CHS1 = social cohesion; CHS2 = task cohesion; CHS3 = norm cohesion; CHS4 = psychological cohesion; LEAD = unit leadership; GROW = personal growth. [a] Estimate = Standardized regression weight (β). S.E. = standard error. C.R. = critical ratio; *p*-value for prediction of significant differences from zero: *** at the level of 0.001 (two-tailed test).

Personal growth (GROW) at the beginning of the training period (T1) was significantly predicted by task cohesion (CHS2, β = 0.599, t = 2.909, *p* = 0.004) and norm cohesion (CHS3, β = 0.599, t = 2.909, *p* = 0.004) for conscripts who completed their training in Unit 1; for those who were trained in Unit 2, the situation appears different, and the highest significance was identified for: social cohesion (CHS1, β = 0.223, t = 1.661, *p* < 0.1), task cohesion (CHS2, β = 0.209, t = 1.503, *p* < 0.1), and unit leadership (LEAD, β = 0.233, t = 2.304, *p* < 0.05).

Mediating effects were evaluated by breaking total effects into direct and indirect effects [48]. Therefore, the indirect effect of perceived stress (PSS) on personal growth (GROW) was assessed using five constructs. Taking into account the redeployment factor, two study models were created: Model Unit1_T1 and Model Unit_T1. The results show that social cohesion (CHS1) was significant for both models (Model Unit1_T1: β = −0.083, 95% CI (−0.204, 0.005); Model Unit2_T1: β = −0.098, 95% CI (−0.291, 0.034)). The mediation effect (perceived stress → social cohesion → personal growth) accounted for 35.47% (Model Unit1_T1) and 33.79% (Model Unit2_T1) of the total effect. Similarly, the relationship between perceived stress (PSS) and task cohesion (CHS2) showed a statistically mediated effect: Model Unit1_T1: β = −0.046, 95% CI (−0.122, 0.025); Model Unit2_T1: β = −0.063, 95% CI (−0.165, 0.048). The mediation effect (perceived stress → task cohesion → personal growth) shows for 19.66% (Model Unit1_T1) and 21.72% (Model Unit2_T1) of the total effect.

Furthermore, unit leadership (LEAD) mediated the relationship between perceived stress and personal growth: Model Unit1_T1: β = −0.043, 95% CI −0.136, 0.002); Model Unit2_T1: β = −0.044, 95% CI (−0.172, 0.007). The mediation effect (perceived stress → unit leadership → personal growth) confirmed for 18.38% (Model Unit1_T1) and 15.17 % (Model Unit2_T1) of the total effect.

Meanwhile, the indirect effect of perceived stress on personal growth through norm cohesion (CHS3) and psychological cohesion (CHS4) was not statistically significant. The direct and indirect effects of all mediators on the relationship between perceived stress and personal growth are presented in Table 6.

3.3.2. The Impact of the End of the Training Period on Personal Growth

At the end of the training period (T2), the differences between two units (Unit 1 and unit 2) have become more visible than at the beginning (T1). First, the results of parallel mediation indicate that perceived stress had a positive effect on the mediating variables evaluated in both units: social cohesion (CHS1, Model UNIT1_T2: β = −0.326, t = −2.660, *p* < 0.008; Model UNIT2_T2: β = −0.526, t = −6.370, *p* < 0.001); task cohesion (CHS2, Model UNIT1_T2: β = −0.499, t = −4.439, *p* < 0.001; Model UNIT2_T2: β = −0.557, t = −6.917, *p* < 0.001); norm cohesion (CHS3, Model UNIT1_T2: β = −0.419, t = −4.439, *p* < 0.001;

Model UNIT2_T2: β = −0.520, t = −6.284, *p* < 0.001); CHS4, Model UNIT1_T2: β = −0.503, t = −4.484, *p* < 0.001; UNIT2_T2: β = −0.573, t = −7.212, *p* < 0.001); and unit leadership (LEAD, UNIT1_T2: β = −0.339, t = −2.772, *p* = 0.006; UNIT2_T2: β = −0.363, t = −4.011, *p* < 0.001) (see Figure 3 and Table 7). Furthermore, personal growth (GROW) at the end of the training period (T2) was significantly predicted only by the unit leadership in both units (LEAD, UNIT1_T2: β = 0.449, t = 3.861, *p* < 0.001; UNIT2_T2: β = 0.219, t = 2.557, *p* = 0.011).

Table 6. The direct and indirect effects of perceived stress on the personal growth at the beginning of the training period (T1).

Path Directions	Model UNIT1_T1			Model UNIT2_T1		
	[a] Estimated Effect	CI (95%)		[a] Estimated Effect	CI (95%)	
		Lower	Upper		Lower	Upper
	Direct Effect					
PSS —> GROW	0.031	−0.517	−0.075	0.055	−0.557	0.331
	Indirect Effect					
PSS —> CHS1 —> GROW	−0.083 *	−0.204	0.005	−0.098 **	−0.291	0.034
PSS —> CHS2 —> GROW	−0.046 **	−0.122	0.025	−0.063 *	−0.165	0.048
PSS —> CHS3 —> GROW	−0.009	−0.061	0.036	0.008	−0.068	0.077
PSS —> CHS4 —> GROW	0.018	−0.008	0.060	0.007	−0.020	0.051
PSS —> LEAD —> GROW	−0.043 **	−0.136	0.002	−0.044 **	−0.172	0.007
Total effect	−0.234 ***	−0.681	−0.149	−0.290 ***	−0.428	−0.067

Notes: PSS = perceived stress; CHS1 = social cohesion; CHS2 = task cohesion; CHS3 = norm cohesion; CHS4 = psychological cohesion; LEAD = unit leadership; GROW = personal growth. [a] Estimated effect = standardized regression weight (β). CI (95%) = confidence interval; *p*-value for prediction of significant differences: * at the 0.1 level, ** at the 0.05 level, *** at the 0.01 level (two-tailed test).

**Table 7.** Standardized regression weight at the end of the training (T2).

Path Directions			Model UNIT1_T2 (Unit 1)				Model UNIT2_T2 (Unit 2)			
			Estimate [a]	S.E.	C.R.	*p*	Estimate [a]	S.E.	C.R.	*p*
CHS1	<—	PSS	−0.326	0.204	−2.660	0.008	−0.526	0.149	−6.370	***
CHS 2	<—	PSS	−0.499	0.163	−4.439	***	−0.557	0.119	−6.917	***
CHS3	<—	PSS	−0.419	0.239	−3.554	***	−0.520	0.164	−6.284	***
LEAD	<—	PSS	−0.339	0.239	−2.772	0.006	−0.363	0.169	−4.011	***
CHS4	<—	PSS	−0.503	0.220	−4.484	***	−0.573	0.146	−7.212	***
GROW	<—	CHS1	0.252	0.148	1.422	0.155	0.532	0.155	3.769	***
GROW	<—	PSS	0.101	0.176	0.798	0.425	0.066	0.191	0.689	0.491
GROW	<—	CHS2	−0.008	0.164	−0.047	0.963	−0.047	0.173	−0.370	0.712
GROW	<—	CHS3	0.064	0.108	0.405	0.685	0.122	0.122	1.011	0.312
GROW	<—	CHS4	0.136	0.105	0.913	0.361	0.002	0.110	0.021	0.983
GROW	<—	LEAD	0.449	0.082	3.861	***	0.219	0.092	2.557	0.011

Notes: PSS = perceived stress; CHS1 = social cohesion; CHS2 = task cohesion; CHS3 = norm cohesion; CHS4 = psychological cohesion; LEAD = unit leadership; GROW = personal growth. [a] Estimate = standardized regression weight (β). S.E. = standard error. C.R. = critical ratio; *p*-value for the prediction of significant differences from zero: *** at the level of 0.001 (two-tailed test).

Second, the impact was evaluated by indirect effects. The results of the indirect effect of perceived stress (PSS) on personal growth (GROW) through five constructs are presented in Figure 3 (part a is for Unit 1 and part b is for Unit 2) and Table 8. The calculations were conducted taking into account the redeployment factor and separating two units once again: Model UNIT1_T2 for Unit 1 area and Model UNIT2_T2 for Unit 2. The modelling results showed that social cohesion (CHS1) was statistically significant only for Unit 2, Model UNIT2_T2: β = −0.272, 95% CI (−0. 489, −0.086). The mediation effect (perceived stress → social cohesion → personal growth) accounted for 71.01% (Model UNIT2_T2) of

the total effect. Unit leadership (LEAD) was a statistically significant mediator in both units: Model UNIT1_T2: $\beta = -0.122$, 95% CI $(-0.276, 0.010)$; Model UNIT2_T2: $\beta = -0.027$, 95% CI $(-0.062, 0.048)$. The mediation effect (perceived stress $\rightarrow$ unit leadership $\rightarrow$ personal growth) shows for 38.49 % (Model UNIT1_T2) and 7.04 % (Model UNIT2_T2) of the total effect. Other mediators were statistically insignificant.

(a)   (b)
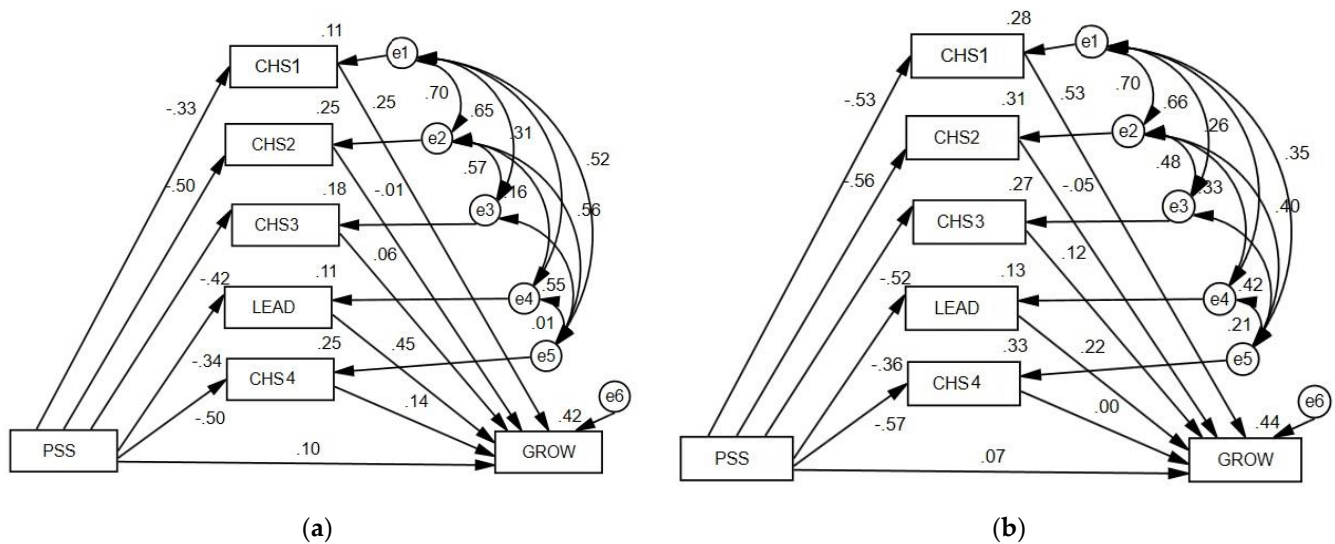
Figure 3. Parallel mediation models designed for personal grow (GROW) assessment. Notes: ($\chi^2 = 10.801$ df $= 2$, $p = 0.005$], CFI $= 0.984$, NFI $= 0.986$, TLI $= 0.918$, RMSEA $= 0.095$ and PCLOSE $= 0.020$) to explain the indirect relationship between perceived stress (PSS) and five constructs (unit cohesion: CHS1, CHS2, CHS3, CHS4 and unit leadership (LEAD)). The standardized path coefficients are presented near the arrows and show the effects of perceived stress, union cohesion, and union leadership on mental personal growth at the end of the training period (T2). Regression coefficients were obtained after controlling for conscription area: (**a**) Model UNIT1_T2 (Unit 1, N = 72); (**b**) Model UNIT2_T2 (Unit 2, N = 112).

Table 8. Direct and indirect effects of perceived stress on personal growth at the end of the training period (T2).

Path Directions	Model UNIT1_T2			Model UNIT2_T2		
	[a] Estimated Effect	CI (95%)		[a] Estimated Effect	CI (95%)	
		Lower	Upper		Lower	Upper
Direct effect						
PSS —> GROW	0.101	−0.071	0.375	0.066	−0.246	0.513
Indirect effect						
PSS —> CHS1 —> GROW	−0.080	−0.243	0.054	−0.272 ***	−0.489	−0.086
PSS —> CHS2 —> GROW	−0.002	−0.112	0.136	−0.008	−0.047	0.070
PSS —> CHS3 —> GROW	−0.009	−0.079	0.025	−0.019	−0.074	0.024
PSS —> CHS4—> GROW	−0.026	−0.108	0.057	0.001	−0.058	0.081
PSS —> LEAD —> GROW	−0.122 ***	−0.276	0.010	−0.027 **	−0.062	0.048
Total effect	−0.317 ***	−0.538	−0.056	−0.383 ***	−0.534	−0.219

Notes: PSS = perceived stress; CHS1 = social cohesion; CHS2 = task cohesion; CHS3 = norm cohesion; CHS4 = psychological cohesion; LEAD = unit leadership; GROW= personal growth. [a] Estimated effect = standardized regression weight (β). CI (95%) = confidence interval; *p*-value for prediction of significant differences: ** at the 0.05 level, *** at the level of 0.01 (two-tailed test).

4. Discussion

The current study investigated the indirect effect of perceived stress on personal growth through mediators in a stable and changed physical environment. The study has shown that small unit leadership and unit cohesion are two statistically significant mediators in explaining how personal growth takes place in a stressful environment during mandatory military training where young men are adapting to the new environment and performing physically and mentally demanding tasks in an artificially created stress environment. At the same time, the study showed that the effects of leadership and unit cohesion change over time and depend on the stability of the environment, i.e., whether the unit was redeployed or was in the same physical location. These findings have several theoretical implications and extend the body of literature.

First, in line with other studies on personal growth, this study provides additional evidence that leadership has a positive effect on personal growth. According to Chaturvedi et al. [49], leadership can enhance personal growth and, following Setiawan's [50] findings, leadership should be considered an important factor in raising fighting spirit and growing the personal endurance of subordinates. It is especially the case in the military, where every military leader is mandated the area of subordinate development [51] and their positive impact on subordinates' stress resilience and motivation [26]. Leadership as a mediator has a significant impact on the diminishing the negative effect of perceived stress on personal growth at the beginning of mandatory military training (in our study, the mediating effect of leadership explains 15.17–18.38% of all diminishing effects). The beginning of the training is the period when the group formation takes pace and when an experienced leader can help overcome different challenges. In addition, our study shows that leadership impact on personal growth is particularly significant when the physical environment is changed, i.e., a unit is redeployed. Leadership is becoming the dominant factor in reducing the negative effects of perceived stress on personal growth (in our study, the mediation effect of unit leadership explains 38.49% of the total diminishing effects when a unit is redeployed). With this, we not only confirm previous findings on positive leadership impact on subordinates [27,28], but we also add that the impact of leadership is particularly significant when the ties between group members are weak due to redeployment (change of physical location).

Second, unit cohesion is a strong mediator between perceived stress and personal growth. Following previous studies in the military, unit cohesion reduces the negative impact of perceived stress on various components of military personnel learning and well-being [52]. The most important element of unit cohesion is social cohesion, as it concerns emotional bonds between team members in a unit [53]. Various studies have shown that social cohesion is a strong predictor of organizational commitment and inclusion [24,53,54], and it also stimulates learning and personal growth [25]. Focusing on mandatory military service where stressful situations are artificially created to promote the resilience of conscripts [55], our study provides evidence that social cohesion diminishes the negative effect of perceived stress on personal growth. At the beginning of mandatory military service, social cohesion accounts for 33.7–35.47% of the total diminishing effects of perceived stress on personal growth, and it grows up to 71.01% at the end of training in the unit without redeployment, where the conditions were favourable for the formation of strong group ties. Meanwhile, task cohesion is found to also be an importantt factor in explaining how personal growth occurs under stress. Task cohesion indicates for 19.66–21.72% effects in our research model at the beginning of training. In addition, other elements of unit cohesion, such as norm cohesion and psychological cohesion, were not statistically significant as mediators in the relationship between perceived stress and personal growth. As in previous studies [56,57], we found a direct relationship between norm cohesion and psychological cohesion in groups (units) on one hand and perceived stress and personal growth on the other. However, a deeper statistical analysis showed that norm cohesion and psychological cohesion are not statistically significant as mediators.

Third, the current findings are in line with group theory, where perceived stress is seen as a social phenomenon. Perceived stress in a group (military unit) is an outcome of group level processes [58]. Therefore, it makes sense that, on the one hand, social cohesion is the strongest mediator in mitigating the negative effect of stress when a group is formed; on the other hand, the effect of social cohesion is not significant if group dynamics is interrupted with external disturbances (redeployment). As found in previous psychological studies, group dynamics has a mitigating effect on perceived stress of [59–62]. Meanwhile, perceived stress remains high in weak teams [63–65]. Our research expands these findings and shows that leadership can replace a lack of social cohesion in the groups and reduce the negative effect of perceived stress on personal growth. This is a fundamentally new insight that allows social cohesion and leadership to be seen not only as complementary factors in group dynamics, but also as substitutes.

Several limitations of this study can restrict the generalizability of the findings. First, data were collected during the pandemic, when conscripts had less physical contact with friends and relatives. This study context may have reduced the nonmilitary effects that could be found to be important in a nonpandemic situation. Second, the study eliminated the factor of personal resilience, which was determined to be important in other studies (see findings [66–68]). Third, the data used in this study are made up of data on self-evaluation and self-perception; therefore, underestimation or overestimation of subjective factors could have occurred, as indicated by other research [69,70]. Third, the research was carried out only in one country (Lithuania, the Europe's north-eastern). Considering culture-specific differences were found to be important in perceived stress measurements [36,71], the country factor can be considered as a limitation of this study.

5. Conclusions

Unit cohesion and unit leadership mitigate the negative effect of perceived stress on personal growth; however, this effect is not constant and depends on the phases of group dynamics. Social cohesion and task cohesion are important mediators at the beginning of mandatory military training. The mediation effect of social cohesion ranges from 33 to 35%, and that of task cohesion is between 19 and 21%. Specifically, social cohesion is a particularly important mediator (impact 71%) in reducing the negative impact of perceived stress on personal growth in a unit that had no external interference, i.e., no redeployment. Our study shows that leadership is an important mitigator when a group is under external interference, i.e., the group is in formation (at the beginning of mandatory military training, its effect is 15–18%) and after redeployment when the bonds between group members are weak (at the end of service, the effect of leadership is 38% in the redeployed unit). Unit redeployment is an important factor in reducing the mediating effect of unit cohesion. In this way, leadership can replace a lack of social cohesion in the group and reduce the negative effect of perceived stress on personal growth. This is a new insight that allows social cohesion and leadership to be seen not only as complementary factors in group dynamics, but also as substitutes.

Other factors of unit cohesion, i.e., norms and psychological cohesion, were statistically insignificant in the models we tested. It should also be added that we found no statistically significant negative effect of perceived stress on personal growth.

Institutional Review Board Statement: The study was approved by the Vilnius Regional Biomedical Research Ethics Committee protocol # 2020/10-1275-754.

Informed Consent Statement: Written informed consent was obtained from all subjects involved in the study.

Data Availability Statement: Data supporting the reported results are archived in the National Open Access Research Data Archive (MIDAS) at www.midas.lt (accessed on 1 April 2022).

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Appendix A

Table A1. Sociodemographic profiles of participants.

Characteristics	Value	
	Unit 1	Unit 2
Age, years (SD)	20.40 (1.287)	20.32 (1.613)
Gender, n (%)		
Male	72 (100%)	112 (100%)
Education, n (%)		
1 Unfinished secondary	1 (1.7)	8 (7.2)
2 Secondary	41 (68.3)	81 (73.0)
3 Vocational school	13 (21.7)	16 (14.4)
4 High school (non-university)	4 (6.7)	3 (2.7)
5 University	1 (1.7)	3 (2.7)
Habitation before conscript service, n (%)		
With parents/grandparents	36 (60.0)	80 (72.1)
In a couple (with girlfriend or boyfriend; wife or husband);	8 (13.3)	10.0 (9.0)
Alone	6 (10)	12.0 (10.8)
Work and study situation before conscript service,		
Did not work or study?	13 (21.7)	30 (27.3)
Had a job	37 (61.7)	62 (56.4)
Was studying	7 (11.7)	11 (10.0)

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