

Quality of life, psychosocial characteristics, and study skills affecting recruits' intention to quit Basic Military Training

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ABSTRACT

Quitting Basic Military Training (BMT) is a problem in the Dutch Armed Forces. Previous research focused on physical factors. Yet, contemporary research focuses on psychosocial characteristics, study skills, and quality of life factors associated with recruits' intention to quit BMT. We combined several factors to identify the key factors affecting recruits' intentions to quit BMT. We also studied gender and rank position differences. Three hundred fifty-five recruits enrolled in BMT participated by completing a self-report questionnaire. Multiple regression analysis showed that being highly engaged with BMT, having a high sense of belonging, and being highly proactive resulted in lower intention to quit. Having a high sense of responsibility resulted in higher intention to quit BMT. For gender, significant differences were found in study skills and self-esteem. For rank positions, significant differences were found in several psychosocial characteristics, study skills, quality of life factors, and intention to quit; with officer rank recruits showing higher intentions to quit than noncommissioned officer rank recruits. These identified factors can be used to improve conditions for BMT recruits. It is further advised to investigate the origin of gender and rank position differences that affect associations between psychosocial characteristics, study skills, quality of life factors, and recruits' intention to quit, so that these differences can be minimized in the future.

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What is the public significance of this article?— This study suggests that being highly engaged with BMT, having a strong sense of belonging at BMT, and being highly proactive resulted in recruits having a lower intention to quit Basic Military Training. Having a high sense of responsibility resulted in higher intention to quit. In addition, differences between male and female recruits and between officer candidates and noncommissioned officer candidates were found regarding several psychosocial characteristics, study skills and quality of life factors and intention to quit Basic Military Training. These identified factors can be used to improve conditions for recruits to prevent quitting Basic Military Training.

In the Dutch Armed Forces, dropout rates from basic military training (BMT) have been a concern for years and remain a prominent issue (Inspecteur-Generaal der Krijgsmacht, 2009; Ministerie van Defensie, 2021). For example, in 2021, 49% of the Dutch recruits did not complete BMT (Staatssecretaris van Defensie, 2022). In the Netherlands, for recruits training for a noncommissioned officer (NCO) or soldier rank, BMT is provided by the

specific command the recruit is admitted to (i.e., Navy, Army, Air Force, Military Police). Officer candidates for army, air force and military police are educated at the Royal Military Academy and for navy and marine corps at the Naval College. The 18-week BMT equips recruits with the required military skills and knowledge, including survival techniques, shooting, obstacle courses, navigation, military ethics, military law, and sports.

Dropouts are expensive because replacements must be recruited, selected, and trained, which is costly in terms of time and money. These are investments that cannot be earned back (Cigrang et al., 1998). Other countries close to the Netherlands experience difficulties with recruiting and retaining personnel as well. The Belgian Armed Forces for example, need to fill around 2000 military personnel positions in the coming years (Statista, 2022). The German Army reports that 18% of their vacancies remained unfilled in 2021 (German Bundestag, 2021). Especially in times of personnel shortages and the current war in Ukraine, armies need to invest in retaining their current and prospective workforce.

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Previous studies have shed light on reasons for dropping out of BMT. Besides physical injuries (Dijksma et al., 2021), physical fitness (Niebuhr et al., 2008; Pope et al., 1999) and other medical attributes (Larson et al., 2002), there are also several psychosocial and personal reasons for dropping out of BMT. For instance, recruits' unrealistic expectations of military life are a key factor related to quitting BMT in the Dutch and Belgian Armed Forces (Lescreve & Schreurs, 2007; Van de Ven & Bergman, 2007). The more disruptive the transition from civilian to military life, the higher drop-out rates in the first weeks of BMT are (Richardson & Vogelaar, 2009). Lack of motivation (Cigrang et al., 1998), homesickness, problems at home, prospects of missions abroad, and other practical concerns are also reasons for recruits to quit (Flach et al., 2000; Van de Ven, 2001).

Studies have shown that reasons for quitting BMT varied for male and female candidates (Van de Ven, 2001) and rank positions recruits are training for (i.e., NCO vs. officer ranks) (Nakkas et al., 2016). In most countries, the military is a very masculine organization (Tziamali, 2021). Only 11.5% of the Dutch military personnel is female (16.5% including civilians and military reserves) (Ministerie van Defensie, 2022). The Dutch Ministry of Defense aims to increase this number to 25% in 2030. Already in 1977, Kanter wrote that women in a predominantly male group tend to adjust their identity and behavior to the norms of the majority. Especially, in very skewed groups where the female share is below 15%, women receive a lot of attention and they cannot afford to make mistakes. Also, female recruits may suffer from harassment or gender-based discrimination (Tziamali, 2021). Severiens and ten Dam (2012) investigated whether gender differences in reasons for leaving higher education were related to the numerical representation of women and men in study programs. Their results showed that not feeling at home in the culture of their institute and feeling different from the other students, were important reasons for quitting for men in female-dominated studies. On the other hand, women in male-dominated studies, quit their studies due to disappointing educational content and lack of motivation. Additionally, Conkright et al., (2022) showed that physical performance of men and women during stressful military operations decreased in a similar manner, but the effect of women's physiological and psychocognitive responses on physical fitness differed from men's responses. That is, for women higher physiological strain resulted in lower physical fitness.

In The Netherlands, the level of secondary education which recruits have completed prior to enlisting, determines the subsequent rank someone can train for in the military. Recruits who are training for the NCO ranks are

in different educational institutes (equivalent to vocational education) than recruits who are training for officer ranks (equivalent to higher education). Regardless of the rank recruits are training for BMT is similar. Since prospective rank is related to educational level, recruits training for officer ranks could feel that they are having more employment opportunities outside of the military. Thus, when recruits are struggling (e.g., psychologically, educationally, or physically) in BMT, the prospect of more employment opportunities outside the military, could result in higher intentions to quit for recruits training for higher ranks. In several studies (Binsch et al., 2015; Lee et al., 2011) the need to examine basic training dropout from a multifactorial perspective was highlighted. This means including multiple categories of predictors in one study simultaneously (e.g., mental, physical, and organizational factors, demographic characteristics, health status, lifestyle, and personality). A category of factors that has been understudied so far is related to learning and education. Educational persistence models and motivational theories investigate constructs associated with study success or failure, e.g., institutional commitment, social involvement, general self-concept, and academic-related skills (e.g., Robbins et al., 2004). Theoretical models for assessing student retention and attrition examine broad categories of factors: 1) student characteristics, 2) aspects related to the educational institution, and 3) external factors (e.g., Bean, 1983; Bean & Metzner, 1985; Pascarella & Terenzini, 1980). The first category pertains to characteristics of students such as cognitive abilities, non-cognitive skills, intrinsic motivation, and personal dispositions (e.g., self-esteem, self-control and flexibility). The second set of factors focuses on education-related elements, such as social and academic integration, school climate, and quality of the curriculum and teaching. The third broad group refers to external factors, such as the job market and job opportunities.

The present study

Although previous studies have provided valuable insight into the factors related to actually quitting BMT, fewer studies have focused on *intention* to quit BMT. Quitting is regarded as the last step of a multi-step process (Rumberger & Rotermund, 2012). Before students actually quit, they are likely to develop *intentions* to quit (Eicher et al., 2014; Mashburn, 2000; Nemtcan et al., 2020). Therefore, investigating intention to quit and associated indicators may add valuable insights to the BMT drop out problem. Allowing for preventive measures before recruits actually quit. For example, knowledge of the factors associated with *intentions to quit* may support in the development of small-scale interventions or a more elaborate redesign of training.

In the present study, we aim to investigate the understanding of the factors that explain intentions to quit BMT among recruits. *Intentions to quit BMT* will be examined from the perspective of students' psychosocial characteristics, study skills, and quality of life factors. Although these factors are associated with intentions to quit general education, they have not yet been investigated in relation to recruits' intentions to quit BMT.

Regarding students' psychosocial characteristics, we focus on self-esteem, proactivity, flexibility, and sociability, which are considered as traits relevant for military careers (Boe & Bang, 2017; Lall et al., 1999; Schaeper, 2019). We define study skills, a concept similar to academic skills (Tressel et al., 2019), as students' ability to manage their resources (time, attention, emotions) to reach their educational goals. We will focus on self-perceived executive functioning skills (e.g., Baars et al., 2015), test anxiety (e.g., Ekornes, 2021), self-regulation (e.g., Pintrich et al., 1991), and sense of responsibility (e.g., Waldrip et al., 2014), which can have an impact on quitting education or on variables associated with dropout (e.g., intention, integration, satisfaction, performance). Quality of life reflects students' perceptions of the quality of their school experiences (Hristova & Tosheva, 2021) and will in our study be addressed by *sense of belonging* and *engagement with school* (Waldrip et al., 2014). Many studies investigating predictors of BMT dropout, take physical fitness into account (e.g., Niebuhr et al., 2008; Pope et al., 1999). This variable is not of primary interest in our study, but we included measures of BMI and engaging in physical activity in our analysis as well. Hence, the present study focuses on explaining *intention to quit BMT* from a comprehensive array of factors. So that in the future, schools providing BMT can pay focused attention to key factors to prevent recruits from actually dropping out. We formulated the following research questions: (1) Which psychosocial characteristics, study skills and quality of life factors affect Dutch BMT recruits' intentions to quit BMT? (2) Are there differences between NCO rank and Officer rank recruits (i.e., rank position) or between male and female (i.e., gender) recruits in intention to quit, psychosocial characteristics, study skills, and quality of life factors? (3) Is the assumed relationship between psychosocial characteristics, study skills and quality of life factors, and intention to quit moderated by gender or rank positions?

Method

Participants

Participants were 355 recruits who are born after 1995 from different educational institutes in the

Dutch Armed Forces. Their mean age was 19.6 years ($SD = 1.78$) and 83% of the recruits were male (i.e., this is representative for the male/female distribution within the Dutch Ministry of Defense (Ministerie van Defensie, 2021)). Of the participants, 56% was training for an NCO rank and 44% was training for an officer rank position (i.e., recruits at the Royal Military Academy and Royal Naval College). The participants were distributed across five schools (the institutes that provide BMT in the Netherlands): (1) the *Royal Military Academy*: training recruits to become officers of the Royal Netherlands Army, Air Force, and Military Police ($n = 92$); (2) the *Royal Naval College*: training recruits to become officers of the Royal Netherlands Navy and the Royal Netherlands Marine Corps ($n = 64$); (3) the *Royal Military School*: training recruits to become soldiers and noncommissioned officers of the Royal Netherlands Army ($n = 50$); (4) *Marines Educational Institute*: training recruits to become enlisted marines of the Royal Netherlands Marine Corps ($n = 73$); (5) the *Royal Air Force Military School*: training all Royal Netherlands Air Force personnel, except officer candidates ($n = 76$).

Instruments

In Table 1, the different subscales corresponding to the variables measured are presented per general factor (i.e., intention to quit, quality of life, psychosocial characteristics, study skills, and physical fitness). For each measured variable the name of the original scale including the reference, the number of items, an example item, type of Likert scales including qualifiers, and Cronbach's α (i.e., based on the data of the present study) are presented.

Design and procedure

This study was approved by TNO's ethical committee (case-number: 2019-059). The data were collected in Fall 2019, around six to eight weeks after starting BMT. The recruits were asked to participate in our study via our point of contact at each of the schools. During a joint session at each school, the contact persons distributed the questionnaires. The first page of the questionnaire consisted of a description of the study which recruits were asked to read before consenting to participation. Consent was asked via an active informed consent form. After completion of the questionnaire participants handed in the questionnaire in an enclosed box, so that the contact person could not access the

Table 1. Information about subscales used to measure the factors related to intention to quit.

Type of factor	Scale	Based on	# items	Example item	(Rating) scale	α
Intention to quit	Intention to Quit BMT	Intention to quit scale (Delahajj et al., 2014, Godlewski & Kline, 2012; Vallerand et al., 1997).	3	I seriously think about quitting BMT.	1 = don't agree at all/5 = completely agree*	.83
Quality of life	Engagement with BMT	Personalized Learning Questionnaire (PLQ) of Waldrup et al. (2014)	4	I am happy at BMT.	1 = don't agree at all/5 = completely agree*	.87
	Sense of Belonging	Sense of belonging at school scale (OECD, 2017)	6	I feel like I belong at BMT.	1 = don't agree at all/5 = completely agree*	.75
Study skills	Attention	Amsterdam Executive Function Inventory (Baars et al., 2015)	3	I am easily distracted.	1 = not true, 2 = partly true, and 3 = true*	.77
	Planning	Amsterdam Executive Function Inventory (Baars et al., 2015)	3	I am well-organized. For example, I am good at planning what I need to do during a day.	1 = not true, 2 = partly true, and 3 = true*	.68
	Self-control	Amsterdam Executive Function Inventory (Baars et al., 2015)	4	I do not consider the consequences before I act.	1 = not true, 2 = partly true, and 3 = true*	.64
	Test anxiety	Motivated Strategies for Learning Questionnaire (MSLQ) (Pintrich et al., 1991)	4	I'm very worried about test.	1 = don't agree at all/5 = completely agree*	.85
	Self-regulation	Motivated Strategies for Learning Questionnaire (MSLQ) (Pintrich et al., 1991)	3**	Before I begin studying, I think about the things I will need to do to learn.	1 = don't agree at all/5 = completely agree*	.65
	Sense of responsibility	Personalized Learning Questionnaire (PLQ) of Waldrup et al. (2014)	4	I am responsible for my own decisions and actions.	1 = don't agree at all/5 = completely agree*	.69
Psychosocial characteristics	Sociability	Simplified HEXACO Personality Inventory (De Vries & Born, 2013)	4	I rather work alone than with others.	1 = don't agree at all/5 = completely agree*	.70
	Proactivity	Simplified HEXACO Personality Inventory (De Vries & Born, 2013)	4**	When there is a problem, I deal with it immediately.	1 = don't agree at all/5 = completely agree*	.64
Physical fitness	Flexibility	Citizenship questionnaire (Ten Dam et al., 2010)	4	How well can you adjust to other people's rules and habits?	1 = not well at all/4 = very well [†]	.63
	Self-esteem BMI	Rosenberg Self-Esteem Scale (Rosenberg, 1965) Body Mass Index is calculated based on self-reported height in cm and weight in kg (World Health Organization Consultation, 2000)	10 2	At times I think I am no good at all. How much do you weigh in kilograms? How tall are you, in cm?	1 = not true for me at all/4 = very true for me)* <18.5 = underweight 18.5–24.9 = normal weight. 25 to 29.9 = overweight. >30 = Obese.	.78 NA
	Physical Activity level		1	In the month prior to BMT: How many days a week did you participate in high-intensity sports activities (for at least 20 minutes a day)	0 = 0 days/7 = 7 days	NA

Wording of the original scales was kept intact as much as possible. The used scales were not revalidated for the present sample. *Likert agreement scale. [†]Likert quality scale. **One item was removed after reliability analysis. NA = Not Applicable.

questionnaires. The data were manually entered into Microsoft Excel and analyzed with IBM SPSS (Version 25).

Results

Descriptive statistics and correlations

The means (M), standard deviations (SD), and Pearson correlations corresponding to *intention to quit* and psychosocial characteristics, study skills, quality of life factors, and physical activity are presented in Table 2. Recruits' ratings of *intention to quit* were low ($M = 1.85$ on a five-point scale, $SD = 0.82$). The recruits also showed rather low mean levels of *self-regulation* ($M = 3.60$ on a five-point scale; $SD = 0.65$) and *proactivity* ($M = 3.62$ on a five-point scale; $SD = 0.62$). Recruits showed high mean levels of *engagement with BMT* ($M = 4.40$ on a five-point scale; $SD = 0.54$), *sense of belonging* ($M = 4.32$ on a five-point scale; $SD = 0.49$), and *sense of responsibility* ($M = 4.23$ on a five-point scale; $SD = 0.47$). As expected, *intention to quit* was positively correlated with test anxiety and negatively with all other characteristics, except self-control. Most of the correlations were small to medium in effect size, the correlations of *intention to quit* with *engagement with BMT* and *sense of belonging* were large. *Intention to quit* was not correlated to *BMI* or *physical activity level*.

Effect of psychosocial characteristics, study skills, quality of life factors

We tested the assumptions of linearity, homoscedasticity, multicollinearity, normality, and independent errors, these were all met. We proceeded using multiple regression analysis. Only the psychosocial characteristics, study skills, quality of life factors that were significantly correlated to *intention to quit* (dependent variable) were simultaneously entered into the model as independent variables (i.e., *engagement with BMT*, *sense of belonging*, *attention*, *planning*, *test anxiety*, *self-regulation*, *sense of responsibility*, *sociability*, *proactivity*, *flexibility*, and *self-esteem*).

The results (Table 3) showed that being highly engaged with BMT, having a high *sense of belonging*, and high *proactivity* resulted in lower *intention to quit*. Having a high *sense of responsibility* resulted in higher *intention to quit*. Together these variables explained 55% of the variance in intention to quit ($F(11, 338) = 38.19, p < .001$).

Differences for gender and rank positions

In Table 4, the means (M), standard deviations (SD) and medians corresponding to *intention to quit* and psychosocial characteristics, study skills, quality of life factors, and physical activity are presented separately for male and female recruits and for NCO and officer rank positions.

The assumptions of homogeneity of variances and normality, required for independent t-test, were violated for several variables. We therefore proceeded our analysis using the Mann-Whitney U-test of which the results are also presented in Table 4.

For gender, significant differences were mainly found in study skills (i.e., *planning*, *test anxiety*, *self-regulation*, and *sense of responsibility*) and *self-esteem*. Women showed higher mean scores than men on the three study skills, but men, showed higher mean scores than women on *self-esteem*. No difference was found for *intention to quit*.

For rank position, the significant differences were mainly found for psychosocial characteristics (i.e., *sociability*, *proactivity*, *flexibility*, and *self-esteem*) but also for *planning*, *test anxiety*, and *intention to quit*. NCO rank recruits showed lower mean scores than officer rank recruits on *intention to quit* and *self-esteem*. Officer rank recruits showed lower mean scores than NCO rank recruits on *sociability*, *proactivity*, *flexibility*, *planning* and *test anxiety*.

Moderating effect of gender and rank position

We tested whether associations between psychosocial characteristics, study skills and quality of life factors, and intention to quit were moderated by gender and by rank position, separately. First, we included the four factors that contributed significantly to *intention to quit* and gender as independent variables in the model (top section of Table 5). Gender significantly moderated the effect of *sense of belonging* on *intention to quit*. This negative effect was stronger for male recruits than for female recruits.

Second, we tested the moderating effect of rank position. The results (bottom section of Table 5) showed a significant positive main effect of rank position on *intention to quit*. This indicates that officer rank recruits have stronger *intention to quit* than NCO rank recruits. The results showed no significant moderation effects of rank position.

Table 2. Means, standard deviations, and correlations between psychosocial characteristics, study skills, quality of life factors, and physical fitness.

	M	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. Intention to quit	1.85	0.82	-														
2. Engagement with BMT	4.40	0.54	-.64***	-													
3. Sense of belonging	4.32	0.49	-.65***	.61***	-												
4. Attention	2.21	0.55	-.21***	.13*	.17**	-											
5. Planning	2.36	0.47	-.14*	.09	.06	.28***	-										
6. Self-control	2.44	0.48	.03	-.06	-.12*	.23***	.07	-									
7. Test anxiety	2.24	0.76	.25***	-.24***	-.33***	-.20***	.04	-.01	-								
8. Self-regulation	3.60	0.65	-.18***	.20***	.20***	.29***	.39***	.09	.09	-							
9. Sense of responsibility	4.23	0.47	-.18**	.32***	.21***	.21***	.31***	.03	-.11*	.47***	-						
10. Sociability	3.82	0.56	-.17***	.26***	.31***	.05	.00	-.22***	-.12*	.12*	.09	-					
11. Proactivity	3.26	0.62	-.22***	.11*	.07	.19***	.41***	-.02	.05	.27***	.32***	.03	-				
12. Flexibility	3.24	0.39	-.13*	.17**	.12*	.12*	.15**	.17**	.05	.22***	.20***	.10	.12*	-			
13. Self-esteem	3.29	0.39	-.33***	.33***	.44***	.22***	.18**	-.05	-.46***	.22***	.30***	.25***	.10	.11*	-		
14. BMI	22.73	2.16	-.04	-.08	-.03	.05	-.05	-.06	-.03	-.11*	-.07	.04	.05	.09	.01	-	
15. Activity level	3.75	1.82	-.08	.04	.03	.09	-.01	.01	-.05	.09	.10	.01	.07	-.09	.10	.10	-

* $p < .05$. ** $p < .01$. *** $p < .001$. M = Mean. SD = Standard Deviation.

Table 3. Results of the multiple regression analysis intention to quit and the psychosocial characteristics, study skills, quality of life factors.

	Intention to quit	
	β	R^2
		.55***
Engagement with BMT	-.41***	
Sense of belonging	-.40***	
Attention	-.06	
Planning	-.02	
Test anxiety	.03	
Self-regulation	-.02	
Sense of responsibility	.11**	
Sociability	.07	
Proactivity	-.16**	
Flexibility	.00	
Self-esteem	-.02	

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

Discussion

The aim of the present study was to gain insight into recruits' psychosocial characteristics, study skills, and quality of life factors and whether these can explain *intention to quit* BMT. We formulated the following research questions: (1) Which psychosocial characteristics, study skills and quality of life factors affect Dutch BMT recruits' intentions to quit BMT? (2) Are there differences between NCO rank and Officer rank recruits (i.e., rank position) or between male and female (i.e., gender) recruits in intention to quit, psychosocial characteristics, study skills, and quality of life factors? (3) Is the assumed relationship between psychosocial characteristics, study skills, quality of life factors, and intention to quit moderated by gender or rank positions?

RQ 1: Factors predicting intention to quit BMT

All attributes, except *self-control*, were individually related to *intention to quit*. Yet, only the quality of life factors *engagement with BMT* and *sense of belonging*, the psychosocial characteristic *proactivity*, and the study skill *sense of responsibility*, together predicted BMT recruits' *intention to quit*. High scores on the quality of life factors and proactivity are related to lower *intention to quit*. Surprisingly, having a high sense of responsibility predicted higher *intention to quit*. It could be that students who feel responsible for their own learning and set more ambitious standards for themselves, may develop intentions to quit when they feel they are failing.

Self-control was not related to *intention to quit*, but the reliability of this scale was questionable, this could explain why this variable was not related to *intention to quit*. Also, self-control is a study skill that is related to cognitive learning (Zimmerman, 1990). In BMT the focus lies also on practical learning (e.g., survival

techniques, shooting, navigation) and physical fitness (e.g., obstacle courses and sports) and less on individual cognitive learning activities. Therefore, self-control may have had less impact on intention to quit BMT.

Also, it was quite surprising that the two physical activity variables were not related to intention to quit BMT. Since physical fitness is a known factor related to actual quitting BMT (Niebuhr et al., 2008; Pope et al., 1999). The self-reported level of physical activity in our sample indicated that participants' average activity level of 3–4 days of exercise per week and participants' average BMI of 22.7 were in the allowable ranges (World Health Organization, 2020; World Health Organization Consultation, 2000). This might indicate that the participants in our study were in good shape, which could explain that, in our sample, *physical fitness* was not a predictor of *intention to quit* BMT.

RQ 2: Gender and rank position differences

For *gender* and *rank position*, we found several significant differences. For *gender*, differences were mainly found in the study skills, whereas for rank positions these differences were found in both psychosocial characteristics and study skills. Women reported higher scores than men on study skills *planning*, *self-regulation* and *sense of responsibility*. This finding is in line with other studies reporting girls to have more developed non-cognitive skills than boys. From young age onwards, girls show higher mean levels of self-control, obedience and concentration and are better able to pay attention in class, to work with others, to organize and keep track of homework and to seek help from others (Evers et al., 2006). NCO rank recruits reported better *planning* skills than officer rank recruits. In general, it is believed that *planning* and organizing are skills associated with students with higher intellectual abilities (Pino Muñoz & Arán Filippetti, 2019), but it has also been reported that metacognitive skills such as *planning* can be executed implicitly (Veenman et al., 2004). Students may not always be aware that they are actually *planning* their learning. This may especially be the case in very practically focused education, such as BMT.

RQ 3: Moderating effects of gender and rank position

The results of the moderation analysis with gender on *intention to quit*, did show a significantly moderating effect of *gender* on the association between *sense of belonging* and *intention to quit*. However, this moderating effect of gender was so small that including this effect

Table 4. Means, standard deviations, medians, and Mann-Whitney U-test results of intention to quit and quality of life factors, study skills, psychosocial characteristics, and physical fitness separate for gender and rank position.

	Male (N = 294)				Female (N = 59)				NCO (N = 199)				Officer (N = 155)				Mann-Whitney U test				Mann-Whitney U test			
	M	SD	Mdn		M	SD	Mdn		M	SD	Mdn		M	SD	Mdn		U	z	p		U	z	p	
1. Intention to quit	1.82	.81	1.67		2.01	.87	2.00		1.76	.79	1.67		1.98	.85	1.67		9856	1.63	.103		18,071	2.81	.005	
2. Engagement with BMT	4.41	.54	4.50		4.38	.58	4.50		4.38	.55	4.50		4.43	.53	4.50		8624	-.11	.912		16,401	1.04	.297	
3. Sense of belonging	4.33	.49	4.33		4.25	.49	4.17		4.30	.52	4.33		4.34	.45	4.33		7721	-1.38	.169		15,706	.30	.765	
4. Attention	2.20	.54	2.33		2.22	.59	2.33		2.23	.51	2.33		2.18	.59	2.33		8951	.35	.724		14,891	-.59	.555	
5. Planning	2.33	.48	2.33		2.54	.41	2.67		2.43	.40	2.33		2.28	.54	2.33		10,915	3.17	.002		13,107	-2.51	.012	
6. Self-control	2.45	.48	2.50		2.37	.51	2.50		2.46	.47	2.50		2.41	.50	2.50		7861	-1.19	.233		14,692	-.80	.424	
7. Test anxiety	2.15	.73	2.00		2.69	.76	2.50		2.31	.77	2.25		2.15	.74	2.25		11,983	4.65	.000		13,483	-1.97	.049	
8. Self-regulation	3.53	.64	3.67		3.91	.61	4.00		3.55	.65	3.67		3.66	.63	3.67		11,937	4.64	.000		17,035	1.81	.071	
9. Sense of responsibility	4.20	.46	4.25		4.36	.48	4.50		4.20	.48	4.25		4.27	.45	4.25		10,466	2.55	.011		16,988	1.66	.980	
10. Sociability	3.83	.56	3.75		3.78	.58	3.75		3.89	.58	4.00		3.74	.53	3.75		8342	-.47	.640		13,007	-2.48	.013	
11. Proactivity	3.24	.62	3.33		3.37	.59	3.33		3.39	.59	3.33		3.10	.61	3.00		9907	1.75	.080		11,380	-4.23	.000	
12. Flexibility	3.25	.40	3.25		3.19	.34	3.00		3.31	.41	3.25		3.15	.35	3.00		7812	-1.24	.217		12,055	-3.55	.000	
13. Self-esteem	3.31	.39	3.40		3.21	.37	3.30		3.25	.39	3.30		3.35	.37	3.40		7241	-1.97	.048		17,430	2.29	.022	
14. BMI	22.91	2.12	23.02		21.84	2.15	21.60		23.23	2.10	23.12		22.09	2.08	22.22		5989	-3.51	.000		10,277	-4.79	.000	
15. Activity level	3.73	1.84	4.00		3.86	1.73	4.00		3.58	1.90	3.00		3.97	1.70	4.00		8565	.35	.723		16,627	2.11	.035	

M = Mean. SD = Standard Deviation. Mdn = Median.

Table 5. Results of the multiple regression analyses intention to quit and the quality of life factors, psychosocial characteristics, and study skills moderated by gender and by rank position.

Gender	Intention to quit		
	β	R^2	ΔR^2
Model 1		.55***	
Engagement with BMT	-.41***		
Sense of belonging	-.40***		
Sense of responsibility	-.08*		
Proactivity	-.17***		
Gender	.05		
Model 2		.56***	.01
Engagement with BMT	-.15		
Sense of belonging	.72***		
Sense of responsibility	.25		
Proactivity	-.27*		
Gender	.15		
Engagement with BMT*Gender	-.68		
Sense of belonging*Gender	.91*		
Sense of responsibility*Gender	.21		
Proactivity*Gender	-.56		
Rank Position			
Model 1		.56***	
Engagement with BMT	-.41***		
Sense of belonging	-.41***		
Sense of responsibility	-.07*		
Proactivity	-.14***		
Rank position	.13***		
Model 2		.57***	.01
Engagement with BMT	-.36***		
Sense of belonging	.40***		
Sense of responsibility	.07		
Proactivity	-.10		
Rank position	.78		
Engagement with BMT*Rank position	-.45		
Sense of belonging*Rank position	-.11		
Sense of responsibility*Rank position	-.14		
Proactivity*Rank position	-.24		

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

to the model did not add any information to the model without gender as a moderator in explaining *intention to quit*. This means that although the negative effect of sense of belonging on intention to quit BMT was stronger for male recruits than for female recruits, this does not explain extra variance in intention to quit BMT on top of the individual factors *sense of belonging*, *engagement with BMT*, *sense of responsibility*, and *proactivity*.

Nevertheless, the moderation effect of gender means that *sense of belonging* is a stronger predictor for male recruits' *intention to quit* BMT than for female recruits. This is similar to the findings of Severiens and ten Dam (2012) who found that being disappointed in educational content and lack of motivation were the main reasons for female students quitting male-dominated studies, whereas male students leaving female-dominated studies was mostly related to not feeling at home. Also, the lower number of female recruits in BMT and Dutch Armed Forces in general, and thus having a lower number of role models, could explain why sense of belonging does not affect female recruits' intentions to quit BMT as much as male recruits. Their reasons for

starting BMT and quitting BMT may therefore be affected more by other factors. For example, gender-based discrimination (i.e., living up to male standards in the BMT) and harassment (Tziamali, 2021). These are factors that we did not measure in the present study, but should be included in follow-up research to better understand female recruits' intention to quit BMT. Concerning rank position, a significant main effect showed that officer rank recruits have stronger *intention to quit* than NCO rank recruits. This contrasts the findings of Lee et al. (2011), but in the present study we explored recruits' intention to quit, not actual quitting. This could explain the difference in findings. All recruits may experience a large gap between civilian and military life (Kelly et al., 2014), which they must adjust to, especially concerning the dangerous and stressful tasks they are training for (Sefidan et al., 2021). Yet, recruits training for officer ranks may see other opportunities for education at civilian universities and colleges that educate for less dangerous tasks outside the military. This could influence their *intention to quit* BMT more than those of NCO rank recruits. No moderating effect of

rank positions on the effect of psychosocial characteristics, study skills, quality of life factors on *intention to quit* was found.

Limitations and suggestions for future research

We conducted a questionnaire study, which enabled us to study a large number of recruits. Although using a questionnaire is a common method to collect information from participants, it has limitations. First, the reliability of some measures was acceptable at best, so the results concerning psychosocial characteristics and study skills, should be interpreted with caution. Especially, the significant results for the proactivity scale should be interpreted with caution and need further evaluation in future studies. The low reliability of some of these scales could be related to the second limitation, that the scales and subscales used were developed for use in civilian samples. We did not revalidate these for use in military samples. Therefore, the information provided in the answers can only be used as a first exploration of the effect of psychosocial characteristics, study skills, quality of life factors, and physical activity on intention to quit BMT. In future studies, scales and subscales could be revalidated or adapted to the military context. Or to gain a deeper understanding of recruits' quality of life, psychosocial characteristics, and study skills affecting their intention to quit BMT, it would be fruitful to conduct follow-up interviews with recruits with high *intentions to quit*, recruits who quit, and recruits who persisted in BMT. In these interviews, recruits could be asked to talk about their considerations, and reasons for quitting or staying in BMT. Such deeper understanding is important for the Dutch Armed Forces to prevent recruits from quitting BMT.

Furthermore, when completing questionnaires, participants can be biased when reporting on their behaviors, experiences, attitudes, and beliefs. For example, participants may have chosen the more socially acceptable answers, or they may have misinterpreted the meaning of certain items caused by arbitrary wording of the items or scoring scales. Second, although participation was voluntarily and anonymously, participants may have felt otherwise. Especially, in the military it is known that voluntary participation is difficult given the extreme hierarchical relationship between superiors and subordinates. We have tried to make sure participants felt they could refuse to participate by stressing that participation was voluntary and anonymous. Also, we made sure that participants could hand in their questionnaire in a closed box, and stressed that their superiors could not access their forms, they could thus

hand in an empty questionnaire if they did not want to participate.

From the literature it is known that resiliency and coping are important protective factors against quitting BMT (Nakkas et al., 2016; Sefidan et al., 2021). We did not measure resiliency or coping since our study was focused on intention to quit, not actual quitting. Yet, in future studies, resiliency and coping could be included when different phases of dropout of BMT are studied longitudinally (i.e., the process from starting BMT, to developing intentions to quit BMT, to actually quitting BMT).

The results of this study can only be generalized to Dutch BMT recruits who were born after 1995 (i.e., often referred to as generation Z). In future research, recruits from other generations (e.g., Generations Y and Alpha) or recruits training to become reserves in the military could also be included. The quality of life, psychosocial characteristics or study skills of these recruits may differ from those recruits who start BMT directly after secondary education. Using discriminant function analysis, it could be studied whether certain items best identify belonging to each of these groups and subsequently whether those items can be used to predict intentions to quit. Also, comparisons between BMT recruits from different countries could shed light on major differences, both in the needs of recruits, but also in the differences between training programs and their effect on *intention to quit*.

Implications for practice

The Dutch Armed Forces can use the identified factors that affect intentions to quit to improve the conditions for recruits in BMT. By focusing on engaging recruits with BMT, increasing recruits' sense of belonging, improving their sense of responsibility, and stimulating their proactiveness the number of recruits with intentions to quit BMT could be affected. For example, to reduce or prevent recruits' intention to quit, ensure that recruits transition smoothly from living with their family and the social network at home to settle in the new place, establishing new friendships and integrating into new social communities. Make sure to provide high quality interactions with peers and military staff to make recruits feel at home and create an open environment and provide tools to bolster recruits' proactivity and responsibility during BMT. Also, getting more insights in the origin of gender differences and rank position differences that affect the association between psychosocial characteristics, study skills, quality of life factors,

physical activity and intention to quit is required to implement changes.

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Data availability statement

Due to the nature of this research, data of this study is not shared publicly.

References

- Baars, M. A. E., Nije Bijvank, M., Tonnaer, G. H., & Jolles, J. (2015). Self-report measures of executive functioning are a determinant of academic performance in first-year students at a university of applied sciences. *Frontiers in Psychology*, 6, Article no.: 1131. <https://doi.org/10.3389/fpsyg.2015.01131>
- Bean, J. P. (1983). The application of a model of turnover in work organizations to the student attrition process. *The Review of Higher Education*, 6(2), 129–148. <https://doi.org/10.1353/rhe.1983.0026>
- Bean, J. P., & Metzner, B. S. (1985). A conceptual model of nontraditional undergraduate student attrition. *Review of Educational Research*, 55(4), 485–540. <https://doi.org/10.3102/00346543055004485>
- Binsch, O., Banko, K. M., Veenstra, B. J., & Valk, P. J. L. (2015). Examining the relationship between mental, physical, and organizational factors associated with attrition during maritime forces training. *Journal of Strength and Conditioning Research*, 29(Suppl. 11), S187–S191. <https://doi.org/10.1519/jsc.0000000000001117>
- Boe, O., & Bang, H. (2017). The big 12: The most important character strengths for military officers. *Athens Journal of Social Sciences*, 4(2), 161–174. <https://doi.org/10.30958/ajss.4-2-4>
- Cigrang, J. A., Carbone, E. G., Todd, S., & Fiedler, E. (1998). Mental health attrition from air force basic military training. *Military Medicine*, 163(12), 834–838. <https://doi.org/10.1093/milmed/163.12.834>
- Conkright, W. R., O'Leary, T. J., Wardle, S. L., Greeves, J. P., Beckner, M. E., & Nindl, B. C. (2022). Sex differences in the physical performance, physiological, and psycho-cognitive responses to military operational stress. *European Journal of Sport Science*, 22(1), 99–111. <https://doi.org/10.1080/17461391.2021.1916082>
- De Vries, R., & Born, M. (2013). The simplified HEXACO personality inventory and an additional interstitial proactivity facet. *Gedrag & Organisatie: Tijdschrift voor Sociale, Arbeids- En Organisatie-Psychologie*, 26(2), 223–245. <https://www.aup-online.com/content/journals/10.5117/2013.026.002.223>
- Delahaij, R., Theunissen, N. C. M., & Six, C. (2014). The influence of autonomy support on self-regulatory processes and attrition in the Royal Dutch Navy. *Learning and Individual Differences*, 30, 177–181. <https://doi.org/10.1016/j.lindif.2013.11.003>
- Dijksma, I., Sharma, J., & Gabbett, T. J. (2021). Training load monitoring and injury prevention in military recruits. *Strength & Conditioning Journal*, 43(2), 23–30. <https://doi.org/10.1519/ssc.0000000000000632>
- Eicher, V., Staerklé, C., & Clémence, A. (2014). I want to quit education: A longitudinal study of stress and optimism as predictors of school dropout intention. *Journal of Adolescence*, 37(7), 1021–1030. <https://doi.org/10.1016/j.adolescence.2014.07.007>
- Eknor, S. (2021). The impact of perceived psychosocial environment and academic emotions on higher education students' intentions to drop out. *Higher Education Research & Development*, 41(4), 1044–1059. <https://doi.org/10.1080/07294360.2021.1882404>
- Evers, F., Mancuso, M., & Livernois, J. (2006). Where are the boys? Gender imbalance in higher education. *Higher Education Management and Policy*, 18(2), 1–13. <https://doi.org/10.1787/hemp-v18-art15-en>
- Flach, A., De Jager, M., & Van de Ven, C. (2000). Fight or flight? The drop-out phenomenon during initial military training: Homesickness. In *The 42nd annual conference of the International Military Testing Association* (pp. 181–187). Edinburgh.
- German Bundestag. (2021). Information from the parliamentary commissioner for the armed forces annual report 2020 (62nd Report). https://www.bundestag.de/resource/blob/839328/e1a864120697c27057534944ceb20111/annual_report_2020_62nd_report-data.pdf
- Godlewski, R., & Kline, T. (2012). A model of voluntary turnover in male Canadian forces recruits. *Military Psychology*, 24(3), 251–269. <https://doi.org/10.1080/08995605.2012.678229>
- Hristova, A., & Tosheva, E. (2021). *Quality of school life and student outcomes in Europe*. Publications Office of the European Union. https://eenee.eu/wp-content/uploads/2021/09/EENEE_AR44-4.pdf
- Inspecteur-Generaal der Krijgsmacht. (2009). *Jaarverslag inspecteur-generaal der krijgsmacht 2008* (nr. 31700-X-113). Ministerie van Defensie.

- Kanter, R. M. (1977). Some effects of proportions on group life: Skewed sex ratios and responses to token women. *American Journal of Sociology*, 82(5), 965–990. <https://doi.org/10.1086/226425>
- Kelly, D. R., Matthews, M. D., & Bartone, P. T. (2014). Grit and hardiness as predictors of performance among west point cadets. *Military Psychology*, 26(4), 327–342. <https://doi.org/10.1037/mil0000050>
- Lall, R., Holmes, E. K., Brinkmyer, K. R., Johnson, W. B., & Yanko, B. R. (1999). Personality characteristics of future military leaders. *Military Medicine*, 164(12), 906–910. <https://doi.org/10.1093/milmed/164.12.906>
- Larson, G. E., Booth-Kewley, S., & Ryan, M. A. K. (2002). Predictors of navy attrition. II. A demonstration of potential usefulness for screening. *Military Medicine*, 167(9), 770–776. <https://doi.org/10.1093/milmed/167.9.770>
- Lee, J. E. C., McCreary, D. R., & Villeneuve, M. (2011). Prospective multifactorial analysis of Canadian forces basic training attrition. *Military Medicine*, 176(7), 777–784. <https://doi.org/10.7205/milmed-d-10-00375>
- Lescrive, F., & Schreurs, B. (2007). Recruiting and retention of military personnel: Belgium. *Recruiting and Retention of Military Personnel. Final Report of Research Task Group HFM-107*, North Atlantic Treaty Organisation - Research and Technology Organisation.
- Mashburn, A. J. (2000). A psychological process of college student dropout. *Journal of College Student Retention: Research, Theory & Practice*, 2(3), 173–190. <https://doi.org/10.2190/u2qb-52j9-ghgp-6lee>
- Ministerie van Defensie. (2021). *Personeelsrapportage midden 2021*. <https://open.overheid.nl/repository/ronl-cd2d8a49-d7cc-4b2b-a8b3-a5a98c858b82/1/pdf/personeelsrapportage-midden-2021.pdf>
- Ministerie van Defensie. (2022). *Personeelsrapportage 2021 [Personnel report 2021]*. <https://www.defensie.nl/downloads/rapporten/2022/05/18/personeelsrapportage-2021>
- Nakkas, C., Annen, H., & Brand, S. (2016). Psychological distress and coping in military cadre candidates. *Neuropsychiatric Disease and Treatment*, 12, 2237–2243. <https://doi.org/10.2147/NDT.S113220>
- Nemtcu, E., Sæle, R. G., Gamst-Klaussen, T., & Svartdal, F. (2020). Drop-out and transfer-out intentions: The role of socio-cognitive factors. *Frontiers in Education*, 5, 606291. <https://doi.org/10.3389/feduc.2020.606291>
- Niebuhr, D. W., Scott, C. T., Powers, T. E., Li, Y., Han, W., Millikan, A. M., & Krauss, M. R. (2008). Assessment of recruit motivation and strength study: Preaccession physical fitness assessment predicts early attrition. *Military Medicine*, 173(6), 555–562. <https://doi.org/10.7205/milmed.173.6.555>
- OECD. (2017). PISA 2015 results (volume III) students' well-being. PISA. OECD Publishing. <https://doi.org/10.1787/9789264273856-en>
- Pascarella, E. T., & Terenzini, P. T. (1980). Predicting freshman persistence and voluntary dropout decisions from a theoretical model. *The Journal of Higher Education*, 51(1), 60–75. <https://doi.org/10.1080/00221546.1980.11780030>
- Pino Muñoz, M. M., & Arán Filippetti, V. (2019). Children's conceptions of intelligence. What is the role of executive functions and self-regulation? *Propósitos Y Representaciones*, 7(2), 269–303. <https://doi.org/10.20511/pyr2019.v7n2.281>
- Pintrich, P., Smith, D., García, T., & McKeachie, W. (1991). *A manual for the use of the motivated strategies for learning questionnaire (MSLQ)*. National Center for Research to Improve Postsecondary Teaching and Learning. <https://eric.ed.gov/?id=ED338122>
- Pope, R. P., Herbert, R., Kirwan, J. D., & Graham, B. J. (1999). Predicting attrition in basic military training. *Military Medicine*, 164(10), 710–714. <https://doi.org/10.1093/milmed/164.10.710>
- Richardson, R. A. L., & Vogelaar, A. L. W. (2009). *Take it or leave it! Een onderzoek naar uitval van militairen bij initiële opleidingen*. Militaire Spectator.
- Robbins, S. B., Lauver, K., Le, H., Davis, D., Langley, R., & Carlstrom, A. (2004). Do psychosocial and study skill factors predict college outcomes? A meta-analysis. *Psychological Bulletin*, 130(2), 261–288. <https://doi.org/10.1037/0033-2909.130.2.261>
- Rosenberg, M. (1965). *Society and the adolescent self-image*. Princeton University Press.
- Rumberger, R. W., & Rotermund, S. (2012). The relationship between engagement and high school dropout. In S. L. Christenson, A. L. Reschly, & C. Wylie (Eds.), *Handbook of research on student engagement* (pp. 491–513). Springer.
- Schaefer, H. (2019). The first year in higher education: The role of individual factors and the learning environment for academic integration. *Higher Education*, 79(1), 95–110. <https://doi.org/10.1007/s10734-019-00398-0>
- Sefidan, S., Pramstaller, M., La Marca, R., Wyss, T., Sadeghi-Bahmani, D., Annen, H., & Brand, S. (2021). Resilience as a protective factor in basic military training, a longitudinal study of the Swiss armed forces. *International Journal of Environmental Research and Public Health*, 18(11), 6077. <https://doi.org/10.3390/ijerph18116077>
- Severiens, S., & ten Dam, G. (2012). Leaving college: A gender comparison in male and female-dominated programs. *Research in Higher Education*, 53(4), 453–470. <https://doi.org/10.1007/s11162-011-9237-0>
- Staatssecretaris van Defensie. (2022). *Lijst van vragen en antwoorden over de Personeelsrapportage 2021 (Kamerstuk 35925-X-78)*. <https://www.tweedekamer.nl/kamerstukken/detail?id=2022Z09695&did=2022D21417>
- Statista. (2022, June 22). *Belgium military personnel 2021*. <https://www.statista.com/statistics/1293508/belgium-military-personnel/>
- Ten Dam, G., Geijssels, F., Reumerman, R., & Ledoux, G. (2010). Burgerschapscompetenties: De ontwikkeling van een meetinstrument. *Pedagogische Studiën*, 87(5), 313–333. https://pure.uva.nl/ws/files/963483/96299_330626.pdf
- Tresselt, T., Lajoie, S. P., & Duffy, M. C. (2019). A guide for study terminology: Reviewing a fragmented domain. *Canadian Psychology/Psychologie Canadienne*, 60(2), 115–127. <https://doi.org/10.1037/cap0000138>
- Tziamali, I. (2021). I would not recommend the Royal Military Academy to my future daughter [In Dutch]. *Militaire Spectator*, 190(9), 436–447. https://www.militairespectator.nl/sites/default/files/teksten/bestanden/militaire_spectator_2021_tziamali.pdf
- Vallerand, R. J., Fortier, M. S., & Guay, F. (1997). Self-determination and persistence in a real-life setting: Toward a motivational model of high school dropout.

- Journal of Personality and Social Psychology*, 72(5), 1161–1176. <https://doi.org/10.1037//0022-3514.72.5.1161>
- Van de Ven, C. (2001). Verloop tijdens de opleiding. Verwachtingen en uitkomsten. *Militaire Spectator*, 170(4), 199–210. <https://www.militairespectator.nl/sites/default/files/bestanden/uitgaven/2001/2001-0199-01-0051.PDF>
- Van de Ven, C., & Bergman, R. (2007). Recruiting and retention of military personnel: The Netherlands. *Recruiting and Retention of Military Personnel. Final Report of Research Task Group HFM-107*, North Atlantic Treaty Organisation - Research and Technology Organisation.
- Veenman, M. V. J., Wilhelm, P., & Beishuizen, J. J. (2004). The relation between intellectual and metacognitive skills from a developmental perspective. *Learning and Instruction*, 14(1), 89–109. <https://doi.org/10.1016/j.learninstruc.2003.10.004>
- Waldrip, B., Cox, P., Deed, C., Dorman, J., Edwards, D., Farrelly, C., Keeffe, M., Lovejoy, V., Mow, L., Prain, V., Sellings, P., & Yager, Z. (2014). Student perceptions of personalised learning: Development and validation of a questionnaire with regional secondary students. *Learning Environments Research*, 17(3), 355–370. <https://doi.org/10.1007/s10984-014-9163-0>
- World Health Organization. (2020). WHO guidelines on physical activity and sedentary behaviour: At a glance.
- World Health Organization Consultation. (2000). Obesity: Preventing and managing the global epidemic. *World Health Organization Technical Report Series*, 894, 1–253.
- Zimmerman, B. J. (1990). Self-regulated learning and academic achievement: An overview. *Educational Psychologist*, 25(1), 3–17. https://doi.org/10.1207/s15326985ep2501_2