

Profile of Physical Fitness, Mental Toughness and Team Cohesion Among Members of the Student Regiment, Battalion 01 Wira Bhakti, Syiah Kuala University, Indonesia

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Abstract. The Student Regiment (Resimen Mahasiswa, Menwa) Battalion 01 Wira Bhakti of Syiah Kuala University is a semi-military student organisation whose members take part in regular physical training and organisational duties. This study describes its members' physical fitness, mental toughness, and team cohesion. A descriptive quantitative survey design with total sampling was used, and all 30 active members (9 male and 21 female) took part. Cardiorespiratory fitness was estimated with the Multi-Stage Fitness Test (bleep test); mental toughness was measured with a 30-item questionnaire covering the three dimensions of the Sport Mental Toughness Questionnaire framework; and team cohesion was measured with a 40-item questionnaire based on the four scales of the Group Environment Questionnaire. Mean estimated $\text{VO}_{2\text{max}}$ was 45.1 for males and 36.2 for females, both within the very good category of the norms applied. However, fewer than half of members in each group reached that category (44.4% of males and 42.9% of females). The mean mental toughness score was 123.4, with 80.0% of members in the high category, and the mean team cohesion score was 176.2, with 86.7% of members in the high category. Members with the longest membership (3.9 years, $n = 3$) had the highest mean $\text{VO}_{2\text{max}}$, but no consistent pattern was observed across shorter membership durations. The results describe a single snapshot in time and should be read as a baseline profile. Because the scoring ranges and psychometric properties of the questionnaire versions used were not reported, comparison with other studies is limited.

Keywords: physical fitness; mental toughness; team cohesion; student regiment; $\text{VO}_{2\text{max}}$.

INTRODUCTION

The Student Regiment (Resimen Mahasiswa, Menwa) is a university-based student organisation oriented towards national defence that adopts a semi-military training model. Its members take part in a wide range of activities, including Pre-Basic Military Training (Pradik), Basic Training (Diksar), patrols, ceremonies and roll calls, all of which require adequate physical and psychological readiness. Battalion 01 Wira Bhakti at Syiah Kuala University is an active unit of this organisation.

Physical fitness is commonly understood as the capacity to carry out daily tasks efficiently with-

out undue fatigue while retaining energy for other activities. Maximal oxygen uptake ($\text{VO}_{2\text{max}}$) is a widely used indicator of cardiorespiratory fitness and, in military settings, has been linked to performance on occupational fitness tests. Among ROTC cadets, $\text{VO}_{2\text{max}}$ correlated with the total score on the Army Combat Fitness Test ($r = .619$) and explained 38% of its variance [1]. Authors [2] followed 74 Angolan cadets through a 34-week military training programme to examine changes in their body composition and cardiorespiratory fitness.

Membership length may matter for fitness because members who have belonged to the unit

longer have accumulated more exposure to routine physical training. This expectation rests on the principle of training adaptation. In masters endurance athletes, changes in training volume explained 54% and 39% of the variance in VO_2max decline in men and women, respectively, and cessation of training led to rapid VO_2max losses [3]. In a 36-month longitudinal study of Brazilian children and adolescents, physical activity showed a linear trend with cardiorespiratory fitness over time (VO_2max : $p = 0.02$ in males, $p = 0.01$ in females) [4]. In the present unit, membership length ranged from 1.2 to 3.9 years.

Psychological readiness is equally important in organisations of this kind. Authors [5] define mental toughness as a personality trait that largely determines how effectively an individual copes with challenges, pressure and stressors. Military personnel are expected to require high mental toughness to cope with volatile, uncertain, complex and ambiguous environments, and authors [6] assessed mental toughness alongside aerobic fitness in 315 Australian Army recruits undertaking basic military training. Comparable evidence for semi-military student organisations remains scarce.

Team cohesion is a further aspect of group-based organisations. In the conceptual model in [7], cohesion is described through individual attraction to the group and group integration, each with a task and a social dimension. A systematic review of longitudinal studies in military contexts concluded that cohesion is a key contributor to team functioning and performance and is associated with positive psychological, social and behavioural outcomes [8].

Although researchers have studied physical fitness, mental toughness, and team cohesion extensively, no empirical profile of the three has been reported for members of Battalion 01 Wira Bhakti. Our observations of the battalion's activities also indicated that some members appeared to tire early during intensive physical training and that membership length varied considerably within the group. We therefore systematically described the three variables to provide a baseline for training planning.

The study addressed three questions:

- 1) What is the physical fitness profile of members of the Student Regiment, Battalion 01 Wira Bhakti, Syiah Kuala University?
- 2) What is their mental toughness profile?

3) What is their team cohesion profile? In addition, VO_2max was summarised descriptively by membership length.

Mental toughness was conceptualised through the three dimensions of the Sport Mental Toughness Questionnaire (SMTQ) framework—confidence, constancy, and control [9]. Confidence refers to an individual's belief in their ability to complete tasks and to maintain self-belief when facing failure; control refers to the ability to manage emotions and to determine one's response to unexpected situations; and constancy reflects perseverance and commitment to continue striving towards goals. Team cohesion was conceptualised through the four scales of the Group Environment Questionnaire (GEQ) — Individual Attractions to the Group-Task (ATG-T), Individual Attractions to the Group-Social (ATG-S), Group Integration-Task (GI-T) and Group Integration-Social (GI-S) — which together reflect task cohesion and social cohesion [7].

METHODOLOGY

The study used a quantitative, descriptive survey design. A survey design was chosen because the aim was to describe the three variables as they occurred, without manipulating any of them.

Syiah Kuala University was founded on 2 September 1961 and is the oldest public university in Aceh Province [10]; since 2022, it has held Public University with Legal Entity Status (PTN-BH) [11]. Data were collected on 23 June 2026, between 07:00 and 11:00 Western Indonesian Time, at the headquarters of Battalion 01 Wira Bhakti in Banda Aceh.

The population comprised all active battalion members enrolled in the 2025–2026 academic year ($N = 30$). Because the population was small, we used total sampling and included all 30 members (9 male and 21 female). Inclusion criteria were active membership, physical and mental health, and willingness to participate, confirmed by a signed informed consent form. Exclusion criteria were injury or illness and unexcused absence on the day of data collection. Membership length was 1.2 years for 10 members, 1.8 years for 4, 2.5 years for 13, and 3.9 years for 3.

Cardiorespiratory fitness was estimated with the Multi-Stage Fitness Test (bleep test), in which each participant runs back and forth over a 20-metre distance to an audio signal of progressive-

ly increasing speed; VO_2max was estimated from the level reached.

Mental toughness was measured with a 30-item questionnaire covering the three SMTQ dimensions, using a 5-point Likert scale. The original SMTQ comprises 14 items [9]; the version used in this study was longer.

Team cohesion was measured with a 40-item questionnaire covering the four GEQ scales (ATG-T, ATG-S, GI-T and GI-S). The original GEQ comprises 18 items [7]; the version used in this study was longer.

Data were collected in two stages. First, we measured physical fitness with the bleep test, scheduled in the morning to avoid midday heat and preceded by a 10-minute warm-up to reduce injury risk. Second, participants completed the two questionnaires individually and without out-

side influence, which took approximately 20–30 minutes.

We classified estimated VO_2max values using age- and sex-specific normative categories. We classified total mental toughness and team cohesion scores into three levels—low, moderate, and high—using mean and standard-deviation cut-offs corresponding to each instrument's measurement scale. We analysed the data descriptively in Microsoft Excel and presented them as means, frequencies, and percentages.

RESULTS AND DISCUSSION

Physical fitness. Mean estimated VO_2max was 45.1 for male members and 36.2 for female members; both means fall within the very good category of the norms applied. However, the distribution across categories was uneven (Table 1).

Table 1 – Estimated VO_2max categories by sex

Sex	n	Mean VO_2max	Very good, n (%)	Fair, n (%)	Other categories, n (%)
Male	9	45.1	4 (44.4)	3 (33.3)	2 (22.2)
Female	21	36.2	9 (42.9)	4 (19.0)	8 (38.1)

Fewer than half of members in each sex reached the very good category, and a substantial share of female members fell into categories other than very good or fair.

These results suggest that cardiorespiratory fitness in the battalion is generally favourable but not uniform, and that some members would benefit from more intensive and structured training. The relevance of this finding is supported by evidence that VO_2max is closely related to performance on military fitness tests [1].

VO_2max by length of membership is shown in Table 2.

Table 2 – Mean estimated VO_2max by length of membership

Length of membership	n	Mean VO_2max
1.2 years	10	38.2
1.8 years	4	39.5
2.5 years	13	37.4
3.9 years	3	47.1

Members with the longest membership (3.9 years) had the highest mean VO_2max , consistent

with the expectation that sustained training exposure supports cardiorespiratory adaptation [3, 4]. However, the pattern was not consistent across the remaining groups: the 2.5-year group, the largest in the sample, had the lowest mean, lower than both the 1.8-year and 1.2-year groups. Moreover, the longest-membership group comprised only three members, and we did not analyse the sex composition of the membership groups. Because male members had a markedly higher mean VO_2max than female members, differences between membership groups may partly reflect differences in their sex composition. The data therefore do not demonstrate a relationship between length of membership and fitness. This relationship should be examined with inferential methods in a larger sample with a more even distribution across membership groups and with sex accounted for.

Mental toughness. The mean mental toughness score was 123.4, which falls within the high category. Of the 30 members, 24 (80.0%) were in the high category, 5 (16.7%) in the moderate category and 1 (3.3%) in the low category. Overall, members reported a strong capacity to handle pressure, challenges, demanding physical training, and organisational duties. The high scores

may reflect the demanding semi-military environment of the Student Regiment. This interpretation should, however, be treated with caution: in 315 Australian Army recruits, basic military training was associated with a mean decline in global mental toughness [6], and the present cross-sectional design cannot establish any effect of training. The six members in the moderate and low categories warrant attention. Approaches such as emotional regulation training, self-efficacy development, and goal-setting could be considered for these members.

Team cohesion. The mean team cohesion score was 176.2, which falls within the high category. Of the 30 members, 26 (86.7%) were in the high category, 3 (10.0%) in the moderate category and 1 (3.3%) in the low category. This indicates a high level of cohesion among battalion members, consistent with the view that cohesion is an important characteristic of groups whose members train and work together intensively [8]. A plausible explanation is the frequency of interaction among members during collective activities, which can strengthen social bonds and mutual trust.

In the model [7], overall cohesion comprises a task dimension (GI-T and ATG-T), reflecting the extent to which members perceive the group as united in pursuing shared goals, and a social dimension (GI-S and ATG-S), reflecting the quality of interpersonal relationships among members. Because this study did not report individual scale scores, the relative contribution of task and social cohesion to the overall result cannot be determined; reporting the four scales separately would be needed to guide specific interventions.

Limitations. Several limitations qualify these findings. First, the study describes a single unit of 30 members at one point in time, so the results cannot be generalised to other units and no causal conclusions can be drawn. Second, the mental toughness and team cohesion questionnaires

were longer versions of the SMTQ and GEQ, and the study does not report their possible score ranges, reliability in this sample, or category cut-off values; therefore, the mean scores and category distributions cannot be compared directly with studies using the original instruments. Third, the study does not report VO₂max categories other than very good and fair. Fourth, VO₂max was estimated indirectly from a field test rather than measured in the laboratory. Finally, the analysis of fitness by length of membership was descriptive, involved very small subgroups, and did not account for the sex composition of the groups.

CONCLUSIONS

Three conclusions can be drawn about members of the Student Regiment, Battalion 01 Wira Bhakti, Syiah Kuala University. First, the mean estimated VO₂max (45.1 for male and 36.2 for female members) falls within the very good category. Still, fewer than half of the members individually reached that category, so fitness within the battalion is not uniform. Second, mental toughness was generally high (mean 123.4), with 80.0% of members in the high category. Third, team cohesion was also high (mean 176.2), with 86.7% of members in the high category.

On this basis, the battalion's physical training programme would benefit from a structured, progressive design based on the principles of overload, progression, and specificity, with particular attention to members who did not reach the very good fitness category and to the six members in the moderate or low mental toughness categories. Future studies should examine the relationship between membership length and physical fitness using inferential methods in a larger, more evenly distributed sample, account for sex, and report the score ranges, reliability, and scale-level results of the questionnaires used.

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