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An Italian Adaptation of the Burnout Assessment Tool-Core Symptoms (BAT-C) for Students

Luciano Romano [1,2,*], Giacomo Angelini [2], Piermarco Consiglio [3,4] and Caterina Fiorilli [2]

[1] Department of Human Sciences, European University of Rome, 00163 Rome, Italy
[2] Department of Human Sciences, University of Rome LUMSA, 00193 Rome, Italy; g.angelini@lumsa.it (G.A.); fiorilli@lumsa.it (C.F.)
[3] Department of Health Psychology, University Medical Center Groningen, University of Groningen, 9713 AV Groningen, The Netherlands; p.consiglio@umcg.nl
[4] Department of Teacher Education, University of Groningen, 9712 TS Groningen, The Netherlands
* Correspondence: Luciano.Romano@unier.it or l.romano9@lumsa.it

Abstract: Burnout is psychological, physical, and emotional suffering that may affect students with low or inadequate resources to face stressful events at school. Although the existing instruments are used worldwide to assess school burnout risk, they show several flaws and mainly focus on the emotional facets of the syndrome. No previous studies have developed a multi-component tool to reveal students' burnout by simultaneously analyzing cognitive, behavioral, and emotional problems. The central core of the current study is to adapt the Burnout Assessment Tool-Core symptoms (BAT-C; Schaufeli et al., 2020), comprising four subscales, exhaustion, mental distance, cognitive impairment, and emotional impairment, for a sample of Italian students. The factor structure, the reliability, and the validity of the scale are investigated. The participants are 745 middle school students (male, 52.2%; aged 9–13, M = 11.84, and SD = 1.21). Confirmatory factor analyses confirmed the best fit of the second-order model (four first-order factors and one second-order factor). Specifically, four factors were loaded onto a main high-order factor, which constitutes the BAT-C. Our findings support the Italian adaptation of the BAT-C for students' samples as a valid instrument for measuring the core symptoms of school burnout.

Keywords: school burnout; school-related stress; middle school students; BAT validation

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1. Introduction

Burnout is a detrimental state that could affect students' attitudes, emotions, and behavior towards the school experience. It is defined as psychological suffering due to intense and frequent experience of stress [1,2]. When internal and external resources to face stressful events are lacking, students may feel emotionally exhausted, overwhelmed by schoolwork, and inadequate in the face of school challenges [3–5]. Findings describe burned-out students as lacking motivation to pursue their goals, showing low interest in the new learning opportunity and a general sense of meaninglessness in classroom activities with a rare sense of community (e.g., [6,7]).

Recent evidence has demonstrated the negative impact of school burnout experience on students' academic careers and later life. For example, research has found a significant association between high levels of burnout and adverse academic outcomes, which, in turn, may increase dropout risk [8,9]. Furthermore, a high level of burnout could negatively impact students' aspirations for future academic degrees [10,11]. Concerning students' later lives, findings have demonstrated that, on one side, students with a high level of school burnout tended to have less ambitious occupational aspirations. On the other side, students who suffered from burnout at school were more likely to experience depressive symptoms later in their adult life [9,12,13].

According to the worldwide education policy makers, the school should be a surveillance point of students' adverse outcomes during their permanence at school and, consequently, later in their lives [14]. In this regard, the central core of the current study is to adapt the Burnout Assessment Tool-Core Symptoms (BAT-C) for a sample of Italian middle school students by [15]. The BAT-C questionnaire, previously conceived for evaluating work-related burnout (for the Italian context, see, for example, [16]), represents a good compendium of scales to measure students' academic burnout from multiple perspectives, coherently with the latest findings in this field.

1.1. School Burnout: Going beyond the Tri-Factor Structure and the Emotional Exhaustion Dimension

School burnout theoretical conceptualization stems from the assumption that the school context could be comparable to the working one and that students may be commensurate with professionals in terms of burnout risk [2]. Effectively, school living involves a series of pressures for students, who have to fulfill several duties and responsibilities related to their school lives. As with workers, chronic stress resulting from the unbalance between students' resources and learning demands and overload can enhance burnout risk [1,12,17–26]. Nonetheless, this starting point related to the comparable workers–students condition has also affected how school burnout has been measured so far. Indeed, the first measure to assess burnout in academic contexts was an adaptation of the MBI for workers (MBI; [27]), for a sample of university students, named the Maslach Burnout Inventory-Student Survey (MBI-SS; [25]). The MBI-SS was composed of three MBI dimensions: emotional exhaustion, cynicism, and (academic) efficacy.

Nonetheless, due to its similarities with the MBI, the MBI-SS shares the same flaws and weaknesses. For instance, according to [28], the evidence that the MBI does not provide a global score precludes knowing the overall burnout status of an individual. According to several authors, the efficacy subscale might be considered a consequence of burnout rather than a constitutive component of the burnout construct (e.g., [29–31]). Further studies have shown that burnout is best represented by two related dimensions, exhaustion and disengagement. The emotional exhaustion dimension of the MBI should be used as a global and representative score to define the whole burnout phenomenon in a continuum [21,32].

Therefore, to overcome the MBI criticisms, new instruments have been developed, such as the School Burnout Inventory (SBI; [1]). The SBI comprises nine items and is characterized by three dimensions: emotional exhaustion, cynicism, and a sense of inadequacy as a student. While the emotional exhaustion and cynicism dimensions were postulated in a similar conceptual way to those of the MBI-SS, the third dimension of sense of inadequacy as a student was formulated with negative wording to overcome the flaws linked to the MBI-SS efficacy dimension (positive worded). Contrary to the MBI-SS, in addition to a score for the different dimensions, SBI also allows the composition of an overall burnout score [1,28]. The SBI has been validated worldwide and is widely used to assess burnout in students [4,33–35].

Nonetheless, a recent study by [36], using an item response theory (IRT) analysis, identified a new SBI structure based on four items (instead of the original nine items structure), and none of these pertain to the emotional exhaustion dimension.

According to the authors, it is possible to assume that respondents compared total emotional exhaustion scores with burnout scores so much that this resulted in the flattening and cancellation of possible individual differences. This result would help explain why there are no items related to the emotional exhaustion dimension in the newly identified structure.

Effectively, previous studies using the SBI considered emotional exhaustion as the first sign and primary dimension of burnout syndrome. At the same time, cynicism works as a coping strategy to counteract the exhaustion and sense of inadequacy, representing burnout's last stage [37–39].

Moreover, the SBI (and the MBI-SS) are silent in representing students' cognitive deterioration as part of their burnout experience (e.g., attention, concentration, working memory impairments). Conversely, recent findings showed that students' rising levels

of distress and strain seem to be a primary contributor to impaired cognitive functioning (i.e., problem solving and poor attentional capacity; [40]). Moreover, further scholars highlighted that, along with exhaustion, school burnout could seriously affect students' well-being in terms of emotional dysregulation and cognitive problems [40–42]. These insights underscore the need to develop a broader tool to assess the different facets of students' burnout.

Overall, the highlighted weaknesses due to the three-factor structure and the overrepresentation of the emotional exhaustion dimension lead to the conceptualization of a more complex burnout construct.

1.2. A New Comprehensive Tool to Evaluate Students' Burnout

The evaluation of the burnout experience may currently count on a new tool to investigate the complex dimensions involved in the syndrome. The Burnout Assessment Tool (BAT; [15]) was initially developed to explore the complex frame of workers' burnout experience. Nevertheless, based on the abovementioned conceptual overlap between work-related stress (i.e., professionals' experience) and school-related stress (i.e., students' experience), the BAT adaptation to student sample may offer the opportunity to investigate burnout more widely than in the past.

In the original study [15], the BAT consisted of a second-order model with four first-order factors (i.e., exhaustion, mental distance, cognitive impairment, and emotional impairment) loaded onto a high-order factor constituting the core symptoms (BAT-C). At the same time, the other two factors (i.e., psychological distress and psychosomatic complaints) loaded onto a super-ordinated and general second factor (BAT-S).

According to [15], both a total score of the BAT and a total score concerning its two main dimensions (BAT-C, BAT-S) and their respective sub-dimensions can be computed. Moreover, both in the original validation study and in other validation studies of the instruments [15,43,44], the factorial validity of the two dimensions was explored separately. Since no previous study has adapted the BAT to a sample of students in light of the evidence mentioned above, we decided to focus on the core symptoms in the present work, thus choosing to adapt only the BAT-C's core symptoms.

The wide range of investigation of the BAT-C is essentially due to the compendium of cognitive and emotional dimensions. In detail, exhaustion represents a feeling characterized by a lack of physical and mental energy, and mental distance consists of a psychological withdrawal from the job. Furthermore, cognitive impairment means a lack of attention and a poor ability to remember things about the job. Finally, emotional impairment is characterized by strong emotional reactions and a sense of being overwhelmed by one's feelings. Therefore, the BAT-C allows us to simultaneously investigate the emotional, psychological, and cognitive dimensions involved in the burnout experience [15,16].

1.3. Aims and Hypotheses

The current study contributes to the adaptation of the BAT-C [15] to a sample of middle school students. Specifically, based on the Italian validated version of the BAT [16], which reflects the structure of the original study by [15], we aimed to examine the factor structure and to investigate the reliability and validity of the scale, taking into account the core symptoms of the scale (BAT-C; see paragraph 1.2).

Furthermore, we made the following two hypotheses:

Hypothsis 1 (H1). *We hypothesized that the total score of BAT-C and its dimensions would be positively associated with emotional exhaustion and academic anxiety, thus confirming convergent validity.*

Hypothsis 2 (H2). *We hypothesized that the total score of BAT-C and its dimensions would be inversely related to resilience and well-being, therefore confirming discriminant validity.*

2. Materials and Methods

2.1. Participants and Procedure

The study involved a convenience sample of 745 Italian middle school students (52.2% male, 47.8% female), aged 9–13 (M = 11.84; SD = 1.21) and adopted a cross-sectional descriptive design. The participants were recruited from two public middle schools in Lombardy (Northern Italy). In detail, the first school encompasses a total of 812 students. A total of 355 students (45% of the total sample) who were involved in this study, belonging to the abovementioned school, had the following characteristics: 51.3% female, 48.7% male, and aged 12–13 (M = 12.51; SD = 0.50). Additionally, the second school comprises a total of 1237 students. A total of 410 students (55% of the total sample) who were involved in this study, belonging to this school, had the following characteristics: 55.1% male, 44.9% female, and aged 9–13 (M = 11.28; SD = 1.33). There were no missing data. The school principal and the school council approved the research protocol, and students learned about the possibility of joining the studies through internal school communications. Participation was voluntary, and only students whose parents gave their written informed consent could participate in the study. Anonymity and confidentiality standards were ensured for all the participants involved. The study was conducted in May 2021. Students compiled a self-report questionnaire with a paper–pencil approach during regular school hours, and it took about 40 min to complete. A research team member gave all the necessary explanations to fill in the questionnaire appropriately and was present in classrooms in case of need. The research protocol follows the Declaration of Helsinki of 1964 and its latest versions. The study procedures received approval from the Ethics Committee of Lumsa University of Rome, Italy.

2.2. Instruments

Burnout Assessment Tool-Core symptoms (BAT-C): The burnout core symptoms were assessed with a modified version of the Italian version of the BAT-C [16] that was adapted for students. For instance, the item "Everything I do at work requires a great deal of effort" (Item 2; Exhaustion dimension) was rephrased as "Everything I do at school requires a great deal of effort". This choice was in line with the abovementioned studies, which have fruitfully adapted burnout instruments from workers to students (e.g., MBI-SS; [2,25]). The BAT-C [15,16] is composed of 23 items on a 5-point Likert scale (1 = "Never" and 5 = "Always"), and it measures four core dimensions of burnout. In detail, exhaustion (8 items; an item example is: "At school, I feel mentally exhausted"), mental distance (5 items; an item example is "I struggle to find any enthusiasm for my study"), cognitive impairment (5 items; an item example is: "At school, I have trouble staying focused"), and emotional impairment (5 items; an item example is "At school, I feel unable to control my emotions").

Connor–Davidson Resilience Scale-10 item (CD-RISC-10): We used the Italian validated version of the Connor–Davidson Resilience Scale-10 item (CD-RISC-10; [45,46]). The scale is composed of 10 items on a 5-point Likert scale (0 = "Almost always false" and 4 = "Almost always true"). An example of an item is: "I am able to adapt to changes". In the present study, Cronbach's alpha was 0.81.

World Health Organization Well-Being Index (WHO-5). We adopted the World Health Organization Well-Being Index (WHO-5; [47]) to assess students' well-being at global levels. The WHO-5 is a scale composed of 5 items on a 6-points Likert scale (0 = "All of the time", 5 = "At no time"). An example is: "I felt cheerful and in a good mood". The WHO-5 has already been used in previous Italian studies with good psychometric properties [16,48]. In the present study, Cronbach's alpha was 0.80.

School Burnout Inventory (SBI). The School Burnout Inventory (SBI) [1,33] is a worldwide scale used to assess students' burnout levels. It comprises nine items and encompasses three dimensions: emotional exhaustion (4 items), cynicism (3 items), and a sense of inadequacy as a student (2 items). The SBI can be used to obtain both a total score and a score related to its single dimensions (see [1]). In the present study, we decided to use only the

emotional exhaustion dimension in light of the evidence that the burnout phenomenon, both in students and workers, is often considered (and measured) as mainly composed of its emotional exhaustion component [16,43]. An example of the emotional exhaustion dimension is: "feel overwhelmed by my schoolwork". In the present study, Cronbach's alpha of the emotional exhaustion dimension was 0.71.

Italian Questionnaire for Anxiety and Resilience (QAR): We used the Italian Questionnaire for Anxiety and Resilience (QAR) [49]. The academic anxiety subscale consists of 7 items on a 5-point Likert scale (1 = "Never" and 5 = "Always"). An example of the academic anxiety subscale is: "Just thinking about exams or tests makes me anxious". The subscale has already been used in previous Italian research with good psychometric properties [4]. In the current study, Cronbach's alpha was 0.89.

2.3. Analysis Plan

First, we performed an item analysis to investigate the items' psychometric properties using SPSS v. 21 (Statistical Product and Service Solutions; IBM Corporation, Armonk, NY, USA). Item analysis is usually performed to observe each item's characteristics (mean, standard deviation, skewness, and kurtosis). It is helpful to detect and delete non-discriminant items, such as items that show extreme means, nearly zero standard deviation, and skewness and kurtosis higher than |2| [50].

Second, a Confirmatory Factor Analysis (CFA), using Mplus v. 8.3 (Muthén & Muthén, Los Angeles, CA, USA), was run to test and replicate the structure of the BAT-C as proposed in the Italian validation study [16]. Specifically, a second-order model was tested (M1), composed of four first-order factors (i.e., exhaustion, mental distance, cognitive impairment, and emotional impairment factors) loading onto a high-order factor (BAT-C).

Then, we compared M1 with a series of alternative models. In detail, M2, M3, M4, M5, M6, and M7 are second-order models with three first-order factors, and one of them was obtained by combining two of the original four factors (i.e., exhaustion, mental distance, cognitive impairment, and emotional impairment). For instance, M2 was a second-order model with three first-order factors, emotional impairment, cognitive impairment, and a combination of exhaustion and mental distance, best represented by a high-order factor consisting of the core symptoms (BAT-C). Moreover, alternative second-order models were tested, in which two factors were obtained by combining three of the four original factors (M8, M9, M10, and M11). For instance, M8 was a second-order model with two first-order factors, i.e., emotional impairment and a combination of exhaustion, mental distance, and cognitive impairment, best represented by a high-order factor, consisting of the core symptoms (BAT-C). Finally, a mono-factorial structure was performed (M12). All models were tested using the maximum likelihood estimation method (ML). The comparison of models was performed by computing a $\chi 2$ difference test [51] to verify if the hypothesized four-factor model (M1) fits significantly better than alternative models. The comparison between models through the $\chi 2$ difference test is widely used to compare models. In detail, the $\chi 2$ difference test indicates whether a given model (M1) fits significantly better or worse than alternative models. Specifically, a significant $\chi 2$ difference suggests that the fit indexes of the alternative model are significantly worse than M1 [51]. The following indexes were used to test the goodness of fit of all the models tested: Chi-square test of exact fit (χ^2), comparative fit index (CFI; >0.95 for good; >0.90 for acceptable; [52–56], Tucker–Lewis index (TLI; >0.95 for good, >0.90 for acceptable; [52–56]), standardized root mean square residual (SRMR; <0.05 for good, <0.10 for acceptable; [52–56]), the root mean square error of approximation (RMSEA; <0.06 for good, <0.08 for acceptable; [52–56]).

Third, we performed the Cronbach's alpha coefficient to verify the internal consistency reliability of both the total score of the BAT-C student version and its related sub-dimensions. According to [50], the acceptable cut-offs for Cronbach's alpha coefficient are the following: $\alpha \geq 0.9$ = excellent, $\alpha \geq 0.8$ = good, $\alpha \geq 0.7$ = acceptable, $\alpha \geq 0.6$ = questionable, $\alpha \geq 0.5$ = poor, and $\alpha < 0.5$ = unacceptable.

Finally, the construct validity was assessed through discriminant and convergent validity to explore the association between BAT-C and its dimensions with other measures.

A graphical representation of the second-order model (four first-order factors and one second-order factor, M1) of the BAT-C-student version (M1) is shown in Figure 1.

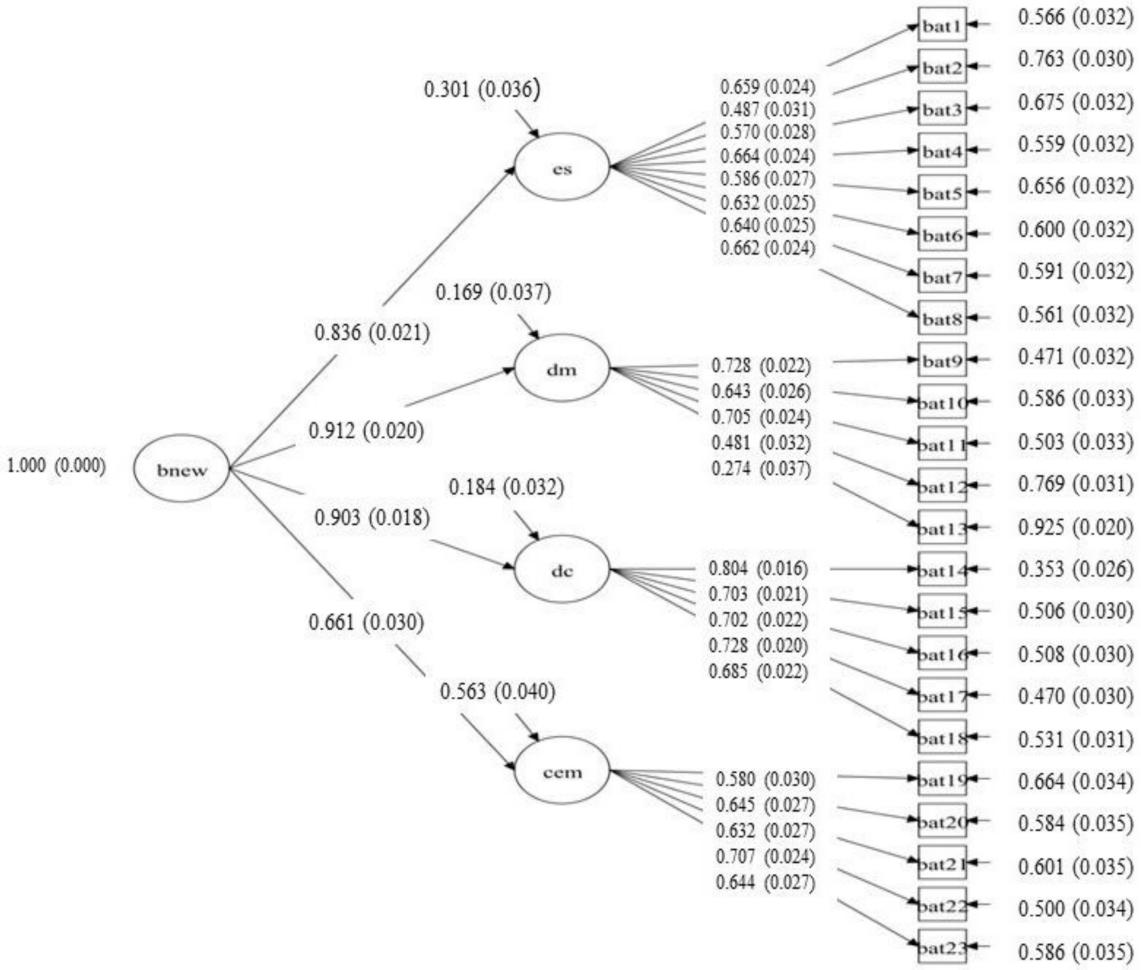

Figure 1. The confirmatory factor analysis results of the four-factor model of the Burnout Assessment Tool-Core symptoms (BAT-C)-student version (M1). Note. bnew = BAT-C, es = Exhaustion, dm = Mental distance, dc = Cognitive impairment, and cem = Emotional impairment.

3. Results

3.1. Descriptive Statistics

Table 1 shows the results of the item analysis.

Table 1. Exploratory descriptive statistics of items included in the BAT-C- student version (n = 745).

Item	M	SD	SK	KU
Exhaustion				
1. At school, I feel mentally exhausted (*A scuola mi sento mentalmente esausto/a*)	2.86	0.99	0.00	−0.37
2. Everything I do at school requires a great deal of effort (*Tutto quello che faccio a scuola richiede un grande sforzo*)	2.96	1.07	0.17	−0.49
3. After a day at school, I find it hard to recover my energy (*Dopo una giornata a scuola trovo difficile recuperare le energie*)	2.37	1.17	0.47	−0.75

Table 1. *Cont.*

Item	M	SD	SK	KU
4. At school, I feel physically exhausted (*A scuola mi sento fisicamente esausto/a*)	2.28	1.11	0.60	−0.39
5. When I get up in the morning, I lack the energy to start a new day at school (*Quando mi alzo la mattina, mi manca l'energia per iniziare una nuova giornata di scuola*)	2.87	1.37	0.14	−1.21
6. I want to be active at school, but somehow I am unable to manage (*Voglio essere attivo/a a scuola, ma in qualche modo non riesco a farcela*)	2.44	1.20	0.40	−0.84
7. When I exert myself at school, I quickly get tired (*Quando mi sforzo a scuola, mi stanco rapidamente*)	2.18	1.11	0.76	−0.14
8. At the end of my school day, I feel mentally exhausted and drained (*Alla fine della mia giornata a scuola, mi sento mentalmente esausto/a e spossato/a*)	2.61	1.22	0.27	−0.92
Mental distance				
9. I struggle to find any enthusiasm for my study (*Faccio fatica a trovare entusiasmo per il mio studio*)	3.10	1.25	−0.02	−0.98
10. At school, I do not think much about what I am doing and I function on autopilot (*A scuola, non penso molto a quello che sto facendo e attivo il pilota automatico*)	2.30	1.13	0.55	−0.47
11. I feel a strong aversion towards my study (*Sento una forte avversione per il mio studio*)	2.48	1.22	0.52	−0.64
12. I feel indifferent about my study (*Mi sento indifferente riguardo il mio studio*)	2.06	1.15	0.86	−0.16
13. I am cynical about what my study means to others (*Sono cinico/a su ciò che il mio studio significa per gli altri*)	2.58	1.43	0.46	−1.08
Cognitive impairment				
14. At school, I have trouble staying focused (*A scuola ho difficoltà a rimanere concentrato/a*)	2.83	1.15	0.24	−0.62
15. At school I struggle to think clearly (*A scuola ho difficoltà a pensare con chiarezza*)	2.32	1.10	0.55	−0.37
16. I am forgetful and distracted at school (*A scuola sono smemorato/a e distratto/a*)	2.48	1.09	0.53	−0.28
17. When I am studying, I have trouble concentrating (*Quando sto studiando, ho difficoltà a concentrarmi*)	2.92	1.24	0.06	−0.97
18. I make mistakes while studying because I have my mind on other things (*Faccio errori mentre studio perché penso ad altre cose*)	2.75	1.24	0.21	−0.96
Emotional impairment				
19. At school, I feel unable to control my emotions (*A scuola, mi sento incapace di controllare le mie emozioni*)	2.13	1.20	0.91	−0.12
20. I do not recognize myself in the way I react emotionally at school (*Non mi riconosco nel modo in cui reagisco emotivamente a scuola*)	2.09	1.20	0.89	−0.20
21. At school, I become irritable when things do not go my way (*A scuola divento irritabile quando le cose non vanno a modo mio*)	2.26	1.27	0.75	−0.46
22. I get upset or sad at school without knowing why (*A scuola mi arrabbio o mi rattristo senza sapere perché*)	1.98	1.24	1.09	0.05
23. At school I may overreact unintentionally (*A scuola potrei reagire in modo eccessivo involontariamente*)	2.04	1.13	0.86	−0.13

Note. M = mean; SD = standard deviation; SK = skewness; KU = kurtosis.

The results showed that no items have extreme means or standard deviations close to zero. In detail, the item with the lowest mean was item 22: "I get upset or sad at school without knowing why" (emotional impairment dimension). In contrast, the one with the highest mean was item 9: "I struggle to find any enthusiasm for my study" (Mental distance dimension). Furthermore, skewness and kurtosis were below |2|; thus, no items were deleted.

3.2. Confirmatory Factor Analysis

Table 2 reports the goodness-of-fit indexes and χ2 differences.

Table 2. Model fit indices for the different BAT-C models (*n* = 745).

Model	χ^2	*df*	CFI	TLI	RMSEA	SRMR	Model Comparison	$\Delta\chi^2$	Δ*df*	*p*
M1: Hypothesized second-order model (4 first-order, 1 s-order)	690.813	226	0.923	0.914	0.053	0.043	-	-	-	-
M2: Alternative second-order model (3 first-order, 1 s-order; ES + DM, DC, CEM)	875.533	227	0.893	0.880	0.062	0.047	M2-M1	184.72	1	$p < 0.001$
M3: Alternative second-order model (3 first-order, 1 s-order; ES + DC, DM, CEM)	996.022	227	0.873	0.858	0.067	0.049	M3-M1	305.20	1	$p < 0.001$
M4: Alternative second-order model (3 first-order, 1 s-order; ES + CEM, DC, DM)	1018.831	227	0.869	0.854	0.068	0.053	M4-M1	328.01	1	$p < 0.001$
M5: Alternative second-order model (3 first-order, 1 s-order; DM + DC, ES, CEM)	748.502	227	0.914	0.904	0.056	0.042	M5-M1	57.68	1	$p < 0.001$
M6: Alternative second-order model (3 first-order, 1 s-order; DM + CEM, DC, ES)	1076.392	227	0.859	0.843	0.071	0.056	M6-M1	385.57	1	$p < 0.001$
M7: Alternative second-order model (3 first-order, 1 s-order; CEM + DC, DM, ES)	1117.576	227	0.853	0.836	0.073	0.057	M7-M1	426.76	1	$p < 0.001$
M8: Alternative second-order model (2 first-order, 1 s-order; ES + DM + DC, CEM)	1070.579	229	0.861	0.846	0.070	0.051	M8-M1	379.76	3	$p < 0.001$
M9: Alternative second-order model (2 first-order, 1 s-order; ES + DC + CEM, DM)	1382.528	229	0.809	0.789	0.082	0.062	M9-M1	691.71	3	$p < 0.001$
M10: Alternative second-order model (2 first-order, 1 s-order; ES + CEM + DM, DC)	1252.681	229	0.831	0.813	0.077	0.060	M10-M1	561.86	3	$p < 0.001$
M11: Alternative second-order model (2 first-order, 1 s-order; DM + DC + CEM, ES)	1208.439	229	0.838	0.821	0.076	0.060	M11-M1	517.62	3	$p < 0.001$
M12: Unidimensional model	1471.263	230	0.795	0.774	0.085	0.064	M12-M1	780.45	4	$p < 0.001$

Note. ES, exhaustion BAT-C; DM, mental distance BAT-C; DC, cognitive Impairment BAT-C; CEM, emotional impairment BAT-C; χ2, chi-square; *df*, degree of freedom; Δχ2, chi-square difference; Δ*df*, degree of freedom difference; CFI, comparative fit index; TLI, Tucker–Lewis index; RMSEA, root mean square error of approximation; SRMR, standardized root mean squared residual.

The results showed that the CFA on the second-order model (four first-order factors and one second-order factor, M1) reached acceptable fit indices to the data. Specifically: $\chi^2(226) = 690.813$, $p < 0.001$; CFI = 0.92; TLI = 0.91; RMSEA = 0.053; SRMR = 0.043. Moreover, the comparison among the models, made through the χ^2 difference test, suggested that M1 fit the data significantly better than the other alternative models tested.

3.3. Reliability and Convergent and Discriminant Validity

The reliability, assessed using Cronbach's alpha, showed a good internal consistency for the total score and the four dimensions. In detail, BAT-C (twenty-three items, $\alpha = 0.90$), exhaustion (eight items, $\alpha = 0.82$), mental distance (five items, $\alpha = 0.70$), cognitive impairment (five items, $\alpha = 0.84$), and emotional impairment (five items, $\alpha = 0.77$). In the Italian validation study [16], Cronbach's alpha scores were exhaustion= 0.90, mental distance = 0.72, cognitive impairment = 0.86, and emotional impairment = 0.80, while Cronbach's alpha for the total score was 0.90. Additionally, in the original study [15], Cronbach's alpha scores were exhaustion = 0.92, mental distance = 0.91, cognitive impairment = 0.92, and emotional impairment = 0.90, while Cronbach's alpha for the total score was 0.95.

Table 3 shows the minimum and maximum, mean, standard deviation, skewness and kurtosis, and correlation matrix among the study variables.

Table 3. Minimum and maximum, means, standard deviations, skewness, kurtosis, and correlations among the study variables ($n = 745$).

	Min	Max	M	SD	SK	KU	2	3	4	5	6	7	8	9
1. BAT- C	1	5	2.44	0.67	0.48	0.01	0.876 **	0.761 **	0.837 **	0.731 **	−0.479 **	−0.429 **	0.571 **	0.551 **
2. ES	1	5	2.57	0.78	0.44	−0.12	1	0.573 **	0.620 **	0.512 **	−0.479 **	−0.411 **	0.542 **	0.548 **
3. DM	1	5	2.50	0.83	0.40	−0.20		1	0.639 **	0.366 **	−0.356 **	−0.280 **	0.326 **	0.315 **
4. DC	1	5	2.66	0.91	0.48	−0.42			1	0.478 **	−0.362 **	−0.406 **	0.481 **	0.404 **
5. CEM	1	5	2.10	0.88	0.97	0.52				1	−0.337 **	−0.267 **	0.455 **	0.475 **
6. WHO	0	25	12.38	5.83	0.07	−0.67					1	0.538 **	−0.378 **	−0.441 **
7. CDRISC	0	40	22.46	7.68	−0.12	−0.28						1	−0.370 **	−0.312 **
8. QARANX	7	35	19.48	7.33	.22	−0.86							1	0.560 **
9. SBI-EXH	4	24	11.41	5.09	.54	−0.45								1

Note. **. $p < 0.01$ (2-tails). M = mean, SD = standard deviation; SK = skewness; KU = kurtosis; BAT-C = burnout assessment tool-core symptoms; ES = exhaustion BAT-C; DM = mental distance BAT-C; DC = cognitive Impairment BAT-C, CEM = emotional Impairment BAT-C; WHO = World Health Organization Well-Being Index; CDRISC = Connor–Davidson Resilience Scale-10 item; QARANX = Academic anxiety; SBI-EXH = Emotional exhaustion dimension of the School Burnout Inventory.

The results of the correlation matrix showed that the exhaustion dimension was positively related to the academic anxiety subscale of the QAR ($r = 0.54$, $p < 0.01$) and the emotional exhaustion dimensions of the SBI ($r = 0.54$, $p < 0.01$). Furthermore, it was inversely related to well-being, measured by the WHO-5 ($r = -0.47$, $p < 0.01$), and resilience, measured by CD-RISC-10 ($r = -0.41$, $p < 0.01$).

Additionally, the mental distance dimension was positively related to the academic anxiety subscale of the QAR ($r = 0.32$, $p < 0.01$) and the emotional exhaustion dimensions of the SBI ($r = 0.31$, $p < 0.01$) and was inversely related to well-being, measured by the WHO-5 ($r = -0.35$, $p < 0.01$), and resilience, measured by CD-RISC-10 ($r = -0.28$, $p < 0.01$).

Additionally, the Cognitive impairment dimension was positively related to the academic anxiety subscale of the QAR ($r = 0.48$, $p < 0.01$) and the emotional exhaustion dimensions of the SBI ($r = 0.40$, $p < 0.01$). Moreover, it was negatively related to well-being, measured by the WHO-5 ($r = -0.36$, $p < 0.01$), and resilience, measured by CD-RISC-10 ($r = -0.40$, $p < 0.01$).

As for the other dimensions, emotional impairment was positively related to the academic anxiety subscale of the QAR ($r = 0.45$, $p < 0.01$) and the emotional exhaustion dimensions of the SBI ($r = 0.47$, $p < 0.01$), and it was negatively related to well-being, measured by the WHO-5 ($r = -0.33$, $p < 0.01$), and resilience, measured by CD-RISC-10 ($r = -0.26$, $p < 0.01$).

Finally, the total score of the BAT-C was positively related to the academic anxiety subscale of the QAR ($r = 0.57$, $p < 0.01$) and the emotional exhaustion dimensions of the

SBI ($r = 0.55$, $p < 0.01$), and it was inversely related to well-being, measured by the WHO-5 ($r = -0.47$, $p < 0.01$), and resilience, measured by CD-RISC-10 ($r = -0.42$, $p < 0.01$).

4. Discussion

The present study aimed to adapt the Burnout Assessment Tool-Core symptoms (BAT-C) to a sample of Italian middle school students. Specifically, based on the Italian validated version of the instrument [16], which reflects the original study by [15], we aimed to examine the factor structure and investigate the scale's reliability and validity. We evaluated the psychometric properties of the BAT-C, analyzing its dimensionality, reliability, convergent, and discriminant validity. To the best of our knowledge, this study represents the first adaptation of BAT-C to students. Our findings suggest that the BAT-C could be considered a valid tool to assess school burnout alongside the most common measures used so far. The results obtained are discussed below.

4.1. Factorial Structure of the Model and Reliability

To assess the dimensionality of the model, we test the second-order model (four first-order and one second-order; M1), replicating the structure of the Italian validation study by [16] (whose factor structure reflects that of the original study by [15]). Furthermore, we compare M1 with a series of alternative models. Our findings showed that the second-order model, composed of four factors (exhaustion, mental distance, cognitive impairment, and emotional impairment) that load on a high-order component (BAT-C), provided excellent fit indices and the best fit to the data when compared to the other models tested. Coherently with the previous original study [15] and the Italian validation study [16], these results indicate that the four dimensions of exhaustion, mental distance, cognitive and emotional impairment represent the main symptoms through which burnout can manifest itself. Furthermore, and differently from other existing instruments (see MBI-SS), our findings showed that by using the BAT-C, it is possible to assess the school burnout phenomenon as a global score (at least in middle school students).

Additionally, Cronbach's alpha coefficients were higher than or equal to 0.70. In line with the Italian validated version [16] and the original study [15], the reliability of the BAT-C and its subscales reached the acceptable cut-offs suggested by [50] also in our sample of middle school students. It is interesting to note that the lowest Cronbach's alpha coefficient pertained to the mental distance dimension ($\alpha = 0.70$). A similar result was also obtained in the Italian validation of the BAT in a teachers' sample ($\alpha = 0.72$; [16]), thus suggesting that further investigations should be conducted, especially in the school context, concerning this burnout component.

4.2. Convergent and Discriminant Validity

The BAT-C total score and dimensions were associated with constructs such as resilience, well-being, academic anxiety, and emotional exhaustion to verify convergent and discriminant validity.

Our findings supported H1, showing that the total score of BAT-C and its dimensions were positively related to the emotional exhaustion dimension of the SBI and the academic anxiety dimension of QAR. However, concerning the association between BAT-C and SBI's emotional exhaustion, it is interesting to note the differences in the magnitude of the Pearson's coefficients despite the confirmed positive relation. Similar to what [16] observed using MBI's emotional exhaustion as a convergent measure, the strongest correlations of the SBI's emotional exhaustion dimension are those between the global score and the BAT-C exhaustion dimension. Nevertheless, when the other dimensions of the BAT-C are considered, the correlations do not exceed 0.50. This finding suggests that the BAT-C dimensions differ substantially from the emotional component alone, even in school.

Moreover, the relation between BAT-C global score, its dimensions, and academic anxiety is not surprising and has been abundantly documented in the existing literature when considering the burnout construct. Previous studies have shown that academic

anxiety, generally linked to performance on exams and tests, represents a significant risk factor for extreme forms of maladjustment, as school burnout is (e.g., [4,57–59]).

Additionally, our results confirmed our H2 concerning the discriminant validity of the tool. In our middle school students' sample, the BAT-C total score and dimension were inversely related to well-being and resilience. In detail, concerning the first relation, our findings align with the conceptualization of mental health provided by [60], who considered well-being the positive end of a mental health continuum [61]. In contrast, distress and burnout could be possible opposing ends. People with high levels of distress and burnout usually tend to experience low levels of well-being and vice versa. Especially in students, this datum should be carefully considered, given the possible negative consequences that conditions such as burnout can entail both within and outside the school context (e.g., [12]).

Furthermore, the results indicated a statistically significant relation between BAT-C and its dimensions and resilience. Many studies demonstrated a negative relationship between resilience and burnout (e.g., [62–64]), thus suggesting that students who are more capable of managing setbacks, challenges, and pressures are more shielded against burnout syndrome ([5,65]).

4.3. Limitations and Future Directions

The study is not without limitations. The sample does not represent the whole country because it only encompasses students from Northern Italy. Moreover, due to convenience sampling used, the current study suffers from a lack of external validity and does not allow the results to be generalized to the entire reference population. Further studies should be conducted using random sampling and extending the study to the Center and Southern Italy to verify whether the new tool represents the burnout phenomenon among middle school pupils across the country.

Furthermore, our sample consisted of only middle school students. Therefore, additional studies are needed to investigate whether the BAT-C can be used with students from different levels (i.e., high school and university). Indeed, university and high school students could be an important population to consider, given that a substantial portion of them are experiencing mental health issues (e.g., [66]), including burnout (e.g., [33]).

Moreover, following what has been proposed by [43] and [16], there is the need to develop BAT-C specific cut-offs to assess the severity of burnout in different nations and populations. Clinical cut-off values for the BAT were calculated in the original study by [15] in a sample of Flanders workers. However, it is necessary to develop specific cut-offs for the Italian population of middle school students because countries, cultures, and people (e.g., students, teachers, and workers) show different levels of burnout [67–69].

5. Conclusions

In sum, the present study provides preliminary evidence concerning the factorial validity, reliability, and construct validity of the BAT-C in the school context. To the best of our knowledge, no previous study has adapted the BAT-C to students so far. Our results, supporting the tool's structure postulated in the original study [15] and confirmed in the Italian version by [16], showed that the BAT-C is a valid and reliable tool for evaluating the core symptoms of burnout in middle school students.

Moreover, from a practical and educational point of view, this tool can be an essential resource for teachers, principals, and policy makers to screen their students' levels of adjustment and overview well-being levels within institutions. In detail, through the BAT-C, it is possible to have a detailed and multi-faceted description of students' negative experiences from multiple points of view, not only from the emotional one. In this way, it will be possible to intervene promptly and in a targeted manner precisely on those aspects that represent the most significant source of discomfort for the student. Moreover, having the possibility to carry out such detailed surveys from the beginning, it is also possible to train teachers appropriately on such a complex phenomenon as burnout at school to intervene as much as possible with a preventive perspective.

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