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ARTICLE

Predictors of assertive behaviors among a sample of first-year Tunisian medical students

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ABSTRACT

Assertiveness is a constructive interpersonal behavior alternative to manipulation and aggression. Medical students (MSs) have daily interpersonal interactions with colleagues, patients and families. Yet, communication deficiencies due to hesitancy to speak-up assertively lead to adverse patient outcomes. This study aimed to assess levels of assertive behaviors (ABs), and to determine its predictors within a sample of first-year Tunisian MSs. This was a cross-sectional survey including 125 first-year MSs from Tunisia. ABs were measured by the Rathus assertiveness scale. Potential independent predictors of AB were evaluated using the following questionnaires: Rosenberg self-esteem scale, interpersonal communication skills inventory short-form-36quality of life questionnaire, and general health questionnaire. In addition, some MSs' characteristics were considered (***eg***; age, sex, living with family, assertiveness training, community work, personal medical field choice, smoking, and alcohol use). Univariate and multivariate analyses were performed. Among the 309 MSs, 125 (40.45%) responded to the survey. AB were found in 36.8% of MSs. Multiple linear regression models revealed that self-esteem global scores, sending clear messages, anxiety/depression and male sex were accountable for 31% in AB scores variance. Targeting self-esteem and interpersonal communication skills (sending clear messages) and identifying subgroups of students with anxiety/depression state would influence ABs.

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1. Introduction

Psychosocial abilities, known as life skills, refer to stabilizing an effective interpersonal relationship for assuming social responsibility, making decisions, and solving conflicts without resorting to actions harmful to the individual or others [1]. In health care field, medical students (MSs), tomorrow's practitioners, are known to have daily direct/indirect interactions with colleagues, families, and health-care recipients [2]. Hence, MSs are required to get appropriate social skills [3,4]. Assertive behavior (AB), a crucial social skill, refers to the ability to say no, ask favors or make requests, express positive and negative feelings, and initiate, continue and finish a general conversation [5]. AB increases self-confidence, enhances interpersonal communications, and enables persons to act in their interests without undue anxiety [6,7]. Scientific data proved that staff who are skilled in communication are faced with fewer problems, make fewer errors, spend fewer resources, and handle difficulties more efficiently [8]. In contrast, failure in communication has adverse effects, such as increased rate of misdiagnosis, increased medical errors, patient dissatisfaction, and noncompliance with health care [2]. Some studies have demonstrated that inadequate information sharing and communication errors due to professionals' hesitancy to speak-up lead to adverse patient outcomes [9–11]. ABs are considered as pivotal components of teamwork and patient safety [12]. It is essential for health-care providers to be able to speak-up assertively when patient safety is at risk [12]. In the literature, the associations between ABs and data, such as interpersonal communication, self-esteem, stress, anxiety and depression, psychological wellbeing (PWB), job satisfaction, cultural sensitivity, and the power of 'saying no' were investigated [4,7,13–23]. Interpersonal communication is a specific area within the domain of communication that refers to face-to-face interactions among two or more persons [24]. AB and good communication are linked [16]. In fact, AB requires effective communication and lack of assertiveness results in restricted effectiveness of communication [16]. These communicative skills

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enable individuals to express their desires/thoughts, and to achieve more successful interpersonal goals [25]. An Indian study [20], which examined the relationship of AB and interpersonal communication satisfaction among 220 nurses, reported that AB had significant positive correlation with interpersonal communication satisfaction [20]. Self-esteem, a core predictor of subjective wellbeing and life satisfaction [26], reflects the individual's overall assessment of self-worth and is considered as a critical element in healthy human development and functioning [27]. University students with low self-esteem clearly show negative professional attitudes and behaviors when they graduate [4]. Scientific findings have identified low self-esteem as a contributing factor to mental health problems including depression, anxiety, and suicidal ideation [28]. Some authors evaluated the associations between AB and self-esteem [17,21]. For instance, Maheshwari et al. [21] concluded that AB had significant positive correlation with self-esteem among nurses. Similarly, Sarkova et al. [17] highlighted that assertiveness was associated with self-esteem among adolescents. With regard to PWB, associations between assertiveness and PWB were explored among 1023 randomly selected Slovak adolescents [17]. The findings indicated that assertiveness was associated with PWB [17]. A research aiming to determine the relationships between assertiveness and the power of 'saying no' with mental health among undergraduate students, revealed significant associations between these constructs [22].

For MSs, life poses particular challenges and stressors, which can affect the quality of life (QoL) [29]. The latter, which includes aspects of physical, mental, and social wellbeing, is measured in terms of individuals' perceptions and levels of satisfaction about their lives [29]. The World Health Organization stated that the development of interpersonal skills is a key element of QoL [29]. When reviewing literature, a distinct lack of studies exploring the associations between AB and QoL aspects was noticed. The studies reviewed addressed either descriptive data of QoL, or its associations with drug abuse [30], academic performance [31], and motivation to learn [32]. Thus, it is important to evaluate the association between AB and QoL in MSs. To the best of the authors' knowledge, there is a lack of Great Arab Maghreb' studies addressing the profile of MSs concerning ABs. Gaining knowledge about ABs and its predictors in a Great Arab Maghreb' sample of undergraduate MSs would be valuable to prevent relationship problems before moving to postgraduate and professional career. First-year grade should be targeted, since evidence stated that among the phases of medical education, first and fourth years are the most stressful [33].

Taking into account the above-mentioned points, the present study handled interpersonal communication skills, self-esteem, QoL and PWB as potential predictors of ABs. The study aimed to assess levels of ABs and to determine its predictors within a sample of first-year Tunisian MSs.

2. Population and methods

2.1. Study design

This was a cross-sectional survey performed from December 2019 to January 2020 of the academic year 2019–2020. The faculty of Medicine of Sousse' administration (Tunisia) provided the authors with the e-mails and phone numbers of the 309 first-year MSs registered for the academic year 2019–2020. Permission to carry out the study was obtained from the Institutional Ethical Committee of the aforementioned faculty (approval N°CEFMS15/2019).

An information form explaining the study purposes was electronically enclosed to the set of questionnaires. In Tunisia, medical education is delivered in French language. Consequently, all survey tools were written in French. Clicking on the button 'start' displayed at Google Forms refers to obtaining the MS consent to take part in the study. During data collection, all e-mails were written in French and only one author (DBC in the authors' list) sent the e-mails and phoned the MSs. The latter author (***ie***; a PhD student in nursing sciences), who never had contacts with the MSs was the only person who managed the list of MSs and the database comprising their responses. The other authors (***ie***; hospital-university doctors from the Faculty of Medicine of Sousse) did not have access to the list of MSs, and one of them (HBS in the authors' list) accessed the anonymized database. All MSs were ensured of confidentiality and anonymity throughout the study, in particular, the administration of the faculty of Medicine had no access to the MSs' data. Figure 1 draws the study flowchart.

2.2. Population

Inclusion criteria were being aged > 18 year old, willing to participate, and understanding French. Google forms questionnaires were made in a way that only one response per participant is accepted and the MS cannot skip any question. This prevented duplicate responses and lacking data.

2.3. Data collection and applied questionnaires

The study was announced to the target population via the website of the faculty of Medicine of Sousse to enhance its visibility (https://www.medecinesousse.com/fra/articles/116/avis-aux-etudiants–pcem1;last

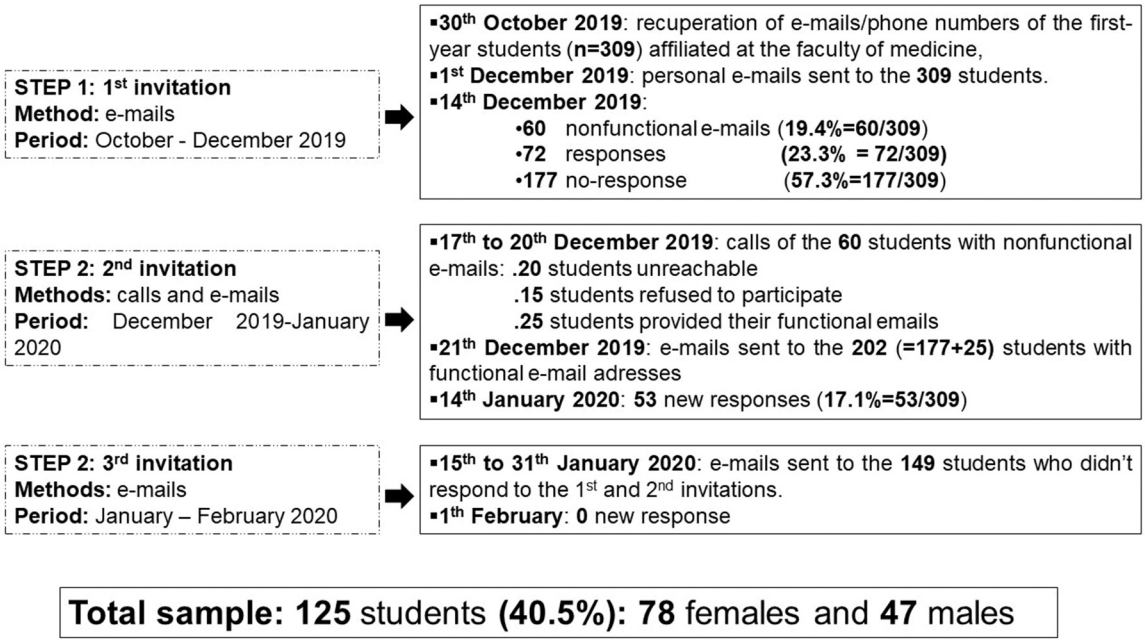

Figure 1. Study flowchart.

visit: 23 June 2022). The announcement included information about the aim of study, its potential benefits and modality of participation. The survey comprises the following six parts: ***i)*** sociodemographic data, ***ii)*** Rathus assertiveness schedule (RAS) [34]; ***iii)*** Rosenberg self-esteem (RSE) scale [35], ***iv)*** Interpersonal communication skills inventory (ICSI) [36], ***v)*** Short-form 36 (SF-36) QoL questionnaire [37]; and ***vi)*** General health questionnaire (GHQ-12) [38].

The *first part* records the following sociodemographic data: age, sex, marital status (***ie***; single, married), residency (***ie***; alone, with family, dormitory), context of previously attending assertiveness training sessions (***ie***; yes/no), participation in community work (***ie***; yes/no), medical curriculum choice (***ie***; personal choice, recommended/suggested by another person), smoking (***ie***; yes/no), and alcohol use (***ie***; yes/no).

The *second part* concerns the RAS [34]. This questionnaire aims to assess the assertiveness skill and impression of one's own assertiveness and frankness [34]. The French validated version was used [39]. It contains 30 items: 17 are described as negative/passive, and 13 of them are positive. Items were rated on a six points Likert scale ranging from (−3) (***ie***; very uncharacteristic of me) to (+3) (***ie***; very characteristic of me). Total scores were obtained by adding numerical responses to each item, after changing the signs of reversed items, which were intended to avoid response bias. Scores range is between −90 (***ie***; highest degree of unassertiveness) to +90 (***ie***; highest level of assertiveness). The cut-off score is of +10 points: scores below +10 define unassertive profiles, and scores above +10 define assertive ones. The scale has relatively high internal consistency and stability [34,39]. In our study, the Cronbach's alpha coefficient was 0.802, indicating a good internal consistency measure reflecting AB.

The *third part* concerns the RSE scale developed by Rosenberg [35]. This questionnaire includes 10 items divided into five positive, and five negative statements showing the sensation of self-worth. The scale was used as a two-factor instrument consisting of a self-confidence subscale for positive self-esteem (*items 1, 2, 4, 6, and 7*) and a self-deprecation subscale for negative self-esteem (*items 3, 5, 8, 9 and 10*). Items are rated on a four-point scale: (3) strongly agree, (2) Agree, (1) disagree, (0) strongly disagree. Scoring for negative answers was reversed, ***ie***; (0) for strongly agree, and (3) for strongly disagree. Scores range is between 0 and 30. The higher total score indicates high self-esteem (better self-confidence and less self-deprecation). Scores between 0 and 14 indicate low self-esteem; 15–25 indicate middle self-esteem; and 26–30 indicate high self-esteem. The RSE scale is the most popular scale among researchers and seemed to be highly reliable [40]. In our study, the French validated RSE version was used [41]. The RSE yielded a score of 0.746 on the Cronbach's alpha coefficient, corresponding to good reliability.

The *fourth part* was reserved to the ICSI [36]. The latter measures patterns, characteristics, and style of interpersonal communication such the individual's ability to listen, to empathize, to understand, to handle their angry feelings, to express oneself, and their conversational attributes [36]. The following four key communication areas are evaluated: sending clear messages, listening, giving and getting feedback, and handling emotional interactions. Participants were required to check one of three possible responses: 'Yes (usually)', 'No (seldom)' and

'Sometimes'. The response to each item is scored from zero to three, and the total score range is between 0 and 120. Higher scores indicate better communication skills [36]. Scores between 1-15 indicate areas of communication skills that need improvement; 16–21 indicate areas of communication skills that need more consistent attention; and 22–30 indicate areas of strength or potential strength. The ICSI English version was translated into French according to the Vallerand validation procedure [42]. Two authors (*DBC* in the authors' list, and an English teacher acknowledged in this paper) performed forward and backward translations. The Cronbach's alpha coefficient for internal consistency was 0.699 corresponding to acceptable reliability.

The *fifth part* was related to the SF-36 [37]. The latter, which measures health-related QoL, includes the following eight concepts: physical functioning, social functioning, role limitation due to physical health, role limitation due to emotional problems, bodily pain, vitality (***ie***; energy and fatigue), general mental health, and general health perceptions [37]. The responses are presented as a profile of scores calculated for each scale. Each domain is scored out of 100, and higher scores indicated less limitation, better functioning or less pain [43]. The QoL is considered altered if the global mean score is less than 66.7 [44]. The SF-36 French version, which has excellent psychometric properties (***ie***; Cronbach's alpha coefficient between 0.85 and 0.94 for the eight subscales), was applied [45]. In this study, the SF-36 French version yielded a Cronbach's alpha coefficient of 0.860.

The *last part* concerns the GHQ [38]. This questionnaire evaluates mental health and detects general psychiatric morbidity in general population surveys, or among general medical outpatients [38]. Three elements of distress are identified: depression and anxiety (*items 1, 3, 4, 7, 8, and 12*), social impairment/dysfunction (*items 2, 5, 6, 9*), and loss of confidence (*items 10, 11*) [38]. The Likert scoring method (0-1-2-3) was used. Scores range is from 0 to 36. A GHQ higher score indicates a greater degree of psychological distress (***ie***; lower PWB). The cut-off is 12 points, and scores >12 define altered PWB [46]. The GHQ-12 French validated version was used in this study [47]. The convergent and discriminant validity of the GHQ-12 was assessed; and the score of each item seems to converge to the score of the dimension to which it belongs.

2.4. Statistical analysis

Sample size: the sample size was estimated using the following formula **[**48**]**: $N = [(Z_\alpha)^2 \times P \times (1 - P) \times D]/E^2]$; where «***P***» was the proportion of the main event of interest (***ie***; frequency of assertive MSs), «***E***» was the margin of error, «$\boldsymbol{Z_\alpha}$»was the normal deviate for one-tailed alternative hypothesis at a level of significance, and «***D***» was the design (= 1 for simple random sampling). According to a Turkish study **[**19**]**, 50.6% (p = 0.506) of nursing students were assertive. Assuming a confidence interval of 95% ($Z_\alpha = 1.64$) and an «*E*» of 0.075, the total sample size was 120 MSs.

Data expression: the Shapiro Wilk test was used to determine whether quantitative data satisfied normal distribution conditions. Quantitative and categorical data were expressed as mean ± standard deviation (95% confidence interval) and numbers (%), respectively.

Univariate and multiple regression analysis (influencing factors): the dependent datum (***ie***; AB) was normally distributed. T-Tests were used to evaluate the associations between the AB and the categorical data (***ie***; sex, residency, assertiveness training, community work, medical field choice, smoking, alcohol use, self-esteem, QoL, and PWB). Pearson product-moment correlation-coefficient (r) and determination-coefficient (r^2) evaluated the associations between AB and quantitative data (***ie***; age, RSE, self-confidence, self-deprecation, ICSI, sending clear messages, listening, giving and getting feedback, handling emotional interaction, QoL, physical functioning, role physical, bodily pain, general health, vitality, social functioning, role emotional, mental health, physical component summary, mental component summary, PWB, anxiety/depression, social dysfunction, and loss of confidence). For AB, multiple linear regressions were developed: only independent data significantly associated with AB, in the previous steps, were included in these regressions. All mathematical computations and statistical procedures were performed using statistical software (StatSoft, Inc. (2011) Statistica, version 10). Significance was set at the 0.05 level.

3. Results

Among the 309 MSs, only 125 (78 females) responded to the survey (participation rate: 40.45%) (Figure 1).

Table 1 illustrates the characteristics of the total sample. It appears that 36.8% of MSs have an AB. The total sample was dominated by females, 73.6% of MSs hada medium self-esteem level, and 17.6% of MSs had an altered QoL or PWB.

3.1. Comparison assertive vs. unassertive MSs

Table 1 illustrates the characteristics of the assertive and unassertive MSs. Compared with assertive MSs, the unassertive peers had lower scores of RSE global score, self-confidence, self-deprecation, ICSI global, sending clear messages, giving and getting feedback, handling emotional interaction, general health, and

Table 1. Characteristics and responses of the undergraduate medical students.

Data	Unit/Category	Total sample (n = 125)	Assertive (n = 46, 36.8%)	Unassertive (n = 79, 63.2%)	*p-value*
Characteristics					
Age	(year)	19.06 ± 0.70 (18.94 to 19.19)	19.17 ± 0.74	19.00 ± 0.68	0.1841
Sex	(male)	47 (37.6)	21 (45.7)	26 (32.9)	0.1586
Living with family	(yes)	58 (46.4)	20 (43.5)	38 (48.1)	0.8623
Assertiveness training	(yes)	14 (11.2)	7 (15.2)	7 (8.9)	0.2808
Community work	(yes)	45 (56.9)	15 (32.6)	30 (38.0)	0.5504
Personal medical field choice	(yes)	116 (92.8)	45 (97.8)	71 (89.9)	0.0987
Smoking	(yes)	6 (4.8)	3 (6.5)	3 (3.8)	0.4959
Alcohol use	(yes)	8 (6.4)	3 (6.5)	5 (6.3)	0.9665
Rathus assertiveness schedule					
Assertive behavior	(score)	4.06 ± 23.14 (−0.04 to 8.15)	29.04 ± 11.89	−10.49 ± 13.68	0.0001*
Rosenberg self-esteem scale					
Rosenberg self-esteem	(global score)	20.51 ± 4.85 (19.65 to 21.37)	22.20 ± 4.12	19.53 ± 5.00	0.0027*
Rosenberg self-esteem' level	(low)	16 (12.8)	3 (6.5)	13(16.4)	0.1096
	(medium)	92 (73.6)	35 (76.1)	75 (94.9)	0.0018*
	(high)	17 (13.6)	8 (17.3)	9(11.4)	0.3530
Self-confidence	(score)	10.66 ± 2.91 (10.15 to 11.18)	11.72 ± 2.59	10.05 ± 2.92	0.0017*
Self-deprecation	(score)	9.85 ± 2.45 (9.41 to 10.28)	10.48 ± 1.92	9.48 ± 2.65	0.0274*
Interpersonal communication skills inventory					
Interpersonal communication skills inventory	(global score)	65.61 ± 12.51 (63.39 to 67.82)	71.72 ± 12.91	62.05 ± 10.85	0.0000*
Sending clear messages	(score)	18.46 ± 4.92 (17.59 to 19.33)	20.48 ± 4.49	17.28 ± 4.79	0.0003*
Listening	(score)	15.56 ± 4.01 (14.85 to 16.27)	16.37 ± 3.96	15.09 ± 3.98	0.0848
Giving and getting feedback	(score)	15.76 ± 4.46 (14.97 to 16.55)	17.46 ± 4.24	14.77 ± 4.31	0.0010*
Handling emotional interaction	(score)	15.83 ± 4.56 (15.03 to 16.64)	17.41 ± 4.89	14.91 ± 4.11	0.0027*
Quality of life: short-form questionnaire					
Quality of life	(global score)	62.27 ± 13.54	64.24 ± 13.51	61.13 ± 13.52	0.2172
Quality of life' level	(altered)	22 (17.6)	25 (54.3)	47 (59.5)	0.5705
	(unaltered)	103 (82.4)	21 (45.7)	32 (40.50)	
Physical functioning	(score)	79.68 ± 21.19 (75.93 to 83.43)	80.87 ± 23.67	78.99 ± 19.73	0.6339
Role physical	(score)	56.60 ± 35.94 (50.24 to 62.96)	58.15 ± 36.91	55.70 ± 35.57	0.7141
Bodily pain	(score)	72.54 ± 23.42 (68.39 to 76.69)	71.79 ± 19.53	72.97 ± 25.53	0.7869
General health	(score)	61.80 ± 14.69 (59.20 to 64.40)	66.30 ± 15.15	59.18 ± 13.85	0.0084*
Vitality	(score)	52.00 ± 14.80 (49.38 to 54.62)	54.13 ± 14.54	50.76 ± 14.89	0.2207
Social functioning	(score)	57.30 ± 21.19 (53.55 to 61.05)	58.42 ± 20.76	56.65 ± 21.54	0.6528
Role emotional	(score)	38.67 ± 36.76 (32.16 to 45.17)	38.40 ± 35.11	38.82 ± 37.91	0.9519
Mental health	(score)	53.86 ± 18.33 (50.61 to 57.10)	57.65 ± 19.04	51.65 ± 17.66	0.0772
Physical component summary	(score)	67.66 ± 17.54 (64.55 to 70.76)	69.28 ± 16.36	66.71 ± 18.22	0.4315
Mental component summary	(score)	50.46 ± 17.29 (47.39 to 53.52)	52.15 ± 17.17	49.47 ± 17.40	0.4046
General health questionnaire					
Psychological wellbeing	(global score)	15.22 ± 4.58 (14.41 to 16.03)	14.65 ± 4.55	15.56 ± 4.59	0.2885
Psychological wellbeing' level	(altered)	22 (17.6)	9 (19.6)	13 (16.5)	0.6610
	(unaltered)	93 (74.4)	37 (80.4)	66 (83.5)	
Anxiety/Depression	(score)	8.94 ± 2.63 (8.48 to 9.41)	8.59 ± 2.80	9.15 ± 2.51	0.2475
Social dysfunction	(score)	4.70 ± 2.22 (4.30 to 5.09)	4.74 ± 2.23	4.67 ± 2.23	0.8693
Loss of confidence	(score)	1.58 ± 1.59 (1.30 to 1.86)	1.33 ± 1.46	1.73 ± 1.65	0.1666

*p-value (Student test or two sided chi-2 test) < 0.05: comparison between the assertive and unassertive groups.
Quantitative data were mean ± standard deviation (95% confidence interval) for the total sample and mean ± standard deviation for the assertive and unassertive groups, respectively. Categorical data were number (%)

Table 2. Univariate analysis between assertive behavior and categorical data (n = 125 undergraduate medical students).

Data	*Category*	Mean ± standard deviation	*p-value*
Sex	Male (n = 47)	9.64 ± 24.05	**0.0358***
	Female (n = 78)	0.69 ± 22.06	
Residency	Alone (n = 38)	6.39 ± 27.97	0.6207
	With family (n = 58)	1.91 ± 21.76	
	Dormitory (n = 29)	5.28 ± 18.86	
Assertiveness training	Yes (n = 14)	0.36 ± 27.30	0.5278
	No (n = 111)	4.52 ± 22.66	
Community work	Yes (n = 45)	3.16 ± 20.69	0.7457
	No (n = 80)	4.56 ± 24.53	
Medical field choice	Personal (n = 116)	5.19 ± 23.34	**0.0488***
	Suggested (n = 9)	−10.56 ± 14.52	
Smoking	Yes (n = 6)	15.83 ± 24.65	0.2026
	No (n = 119)	3.46 ± 23.01	
Alcohol use	Yes (n = 8)	2.13 ± 25.61	0.8084
	No (n = 117)	4.19 ± 23.08	
Self-esteem	Low (n = 16)	−11.87 ± 20.16	**0.0108†**
	Medium (n = 92)	6.00 ± 22.85	
	High (n = 17)	8.53 ± 22.43	
Quality of life	Altered (n = 72)	1.57 ± 21.87	0.1623
	Unaltered (n = 53)	7.43 ± 24.50	
Psychological wellbeing	Altered (n = 22)	9.64 ± 21.61	0.2141
	Unaltered (n = 103)	2.86 ± 23.38	

*p-value (student test) <0.05: comparison between 2 groups. †p-value (Analysis of variance) <0.05: comparison between 3 groups.

included a higher percentage of MSs having a medium RSE level (76.1% vs. 94.9%, respectively).

3.2. Univariate analysis

Table 2 exposes the univariate analysis between AB and categorical data of MSs. Sex, medical field choice and self-esteem were the categorical factors that influence AB. Compared with males, females had lower score of AB. Compared with MSs who willingly chose medical field, MSs whose decision was suggested by another person reported lower scores of AB. The self-esteem levels (low, medium, high) influenced the AB.

Table 3 illustrates the univariate analysis between AB and quantitative data of MSs. The following data were significantly correlated with AB: RSE global score, self-confidence, self-deprecation, ICSI global score, sending clear messages, giving and getting feedback, handling emotional interactions, QoL global score, general health, vitality, social functioning, mental health, mental component summary, PWB global score, depression/anxiety, and loss of confidence.

3.3. Multivariate analysis: influencing factors of AB

Table 4 illustrates the independent data included in the AB multiple regression models. Only RSE global score, sending clear messages, anxiety/depression, and sex appeared to influence AB. Altogether, these four data explain 31.00% of AB scores variance.

4. Discussion

The main results of the current study were:

i) 36.8% of first-year MSs were assertive;

ii) Compared with assertive MSs, the unassertive peers had lower values of RSE global score, self-confidence score, self-deprecation score, ICSI global score, sending clear messages score, giving and getting feedback score, handling emotional interaction score, general health score. However, the unassertive group yielded a higher percentage of MSs having a medium self-esteem level, when compared with assertive peers; and

iii) RSE global score, sending clear messages, anxiety/depression, and sex influence AB. Altogether, these four data explain 31.00% of AB scores variance.

To the best of the authors' knowledge, this is the first study that addresses the profile of MSs concerning ABs. Table 5 illustrates the designs/results of some studies evaluating the AB and its determinants in nurse students [18,19,49], nurses [16,20,21], undergraduate students [22,50], and adolescent students [17].

4.1. Discussion of results

4.1.1. AB data and frequency

The AB mean score was 4.06 ± 23.14 and 36.8% of first-year Tunisian MSs were assertive. First, our reported AB mean values were intermediate between those reported in literature (Table 5) where mean values ranged between −10.76 ± 8.69 [20,21] and 112.64 ± 15.6 [19], and it was closer to the mean reported by Ekinci et al. [51] (***ie***; 6.52 ± 16.84). Second, our AB mean value was positive. This was in line with positive values reported in some studies [4,17–19,50–55], and opposite to negative values highlighted in some other studies [20,21,50,56,57]. Third, the frequency of AB reported in Tunisian MSs was lower than these reported in literature: 50.6% [18], 60.4% [49], 68.4% [55], 70.4%

Table 3. Univariate analysis between assertive behavior and quantitative data of undergraduate medical students (n = 125).

Data	Unit	Correlation coefficient	*p-value*
Characteristics			
Age	(years)	0.1206	*0.1805*
Rosenberg self-esteem scale			
Rosenberg self-esteem	(global score)	**0.3872**	**0.0001***
Self-confidence	(score)	0.3665	**0.0001***
Self-deprecation	(score)	0.3326	**0.0002***
Interpersonal communication skills inventory			
Interpersonal communication skills inventory	(global score)	0.3776	**0.0001***
Sending clear messages	(score)	0.3769	**0.0001***
Listening	(score)	0.1010	0.2625
Giving and getting feedback	(score)	0.2627	**0.0031***
Handling emotional interaction	(score)	0.2838	**0.0013***
Quality of life: short-form questionnaire			
Quality of life	(global score)	0.1783	**0.0466***
Physical functioning	(score)	0.0430	0.6337
Role physical	(score)	0.0379	0.6752
Bodily pain	(score)	−0.0233	0.7962
General health	(score)	0.2656	**0.0028***
Vitality	(score)	0.2765	**0.0018***
Social functioning	(score)	0.1953	**0.0291***
Role emotional	(score)	0.0306	0.7348
Mental health	(score)	0.2606	**0.0033***
Physical component summary	(score)	0.0802	0.3738
Mental component summary	(score)	0.2043	**0.0223***
General health questionnaire			
Psychological wellbeing	(global score)	−0.2275	**0.0107***
Anxiety/Depression	(score)	−0.2385	**0.0074***
Social dysfunction	(score)	−0.0577	0.5228
Loss of confidence	(score)	−0.1809	**0.0437***

*p-value < 0.05.

[51], and 70.7% [52]. The relatively low percentage of AB in our sample testifies that MSs do not consistently communicate in an assertive way. This may be due to the presence of a number of barriers that might inhibit ABs. One possible explanation may be inherent to the nature of Arab societies, which prevent freely disclosing one's feelings, ideas and attitudes [58]. Some faulty assumptions related to Arab culture prohibit assertiveness, and rather induce passivity to young people [58]. On the other hand, medical education is a difficult process, and MSs are held to high standards compared to other professional fields [59]. This may induce stress and anxiety and lead to avoidance behaviors [59]. In addition, the transition from high school to university brings challenges such as personal adjustment to a new life, separation from families and building new social friendship [60]. Altogether, these factors may lead to restriction to openly communicate one's needs, emotions and thoughts [60]. From a theoretical perspective, the lack of AB was originally conceptualized as reflecting a deficit in behavior, where individuals did not know how or when to be appropriately assertive [61]. The relatively low percentage of assertive MSs in this study sample may suggest the necessity for developing assertiveness training to enhance ABs among MSs.

4.1.1.1. Comparison assertive vs. unassertive MSs. Compared with assertive MSs, the unassertive peers had lower values of RSE global score, self-confidence score, self-deprecation score, ICSI global score, sending clear messages score, giving and getting feedback, handling emotional interaction score, general health score, and included a higher percentage of MSs having a medium RSE medium level (Table 1). To the best of the authors' knowledge, no previous study has compared the profile of assertive and unassertive students (Table 5). Assertiveness is deemed as a behavior toward the outside world, and it is an expression of perceptions toward oneself (***ie***; self-esteem) [17]. Individuals who have ABs demonstrate respect for oneself and others; promote self-disclosure and self-control and have positive

Table 4. Independent data included in the assertive behavior multiple regression model.

Independent data	Unit/category	(B)	95% confidence interval around each B	p-value	Cumulative r^2
Constant		−22.203	-	0.0524	-
Rosenberg self-esteem	(global score)	1.161	−44.410 to 0.004	0.0039	0.1499
Sending clear messages	(score)	1.425	0.388 to 1.934	0.0004	0.2143
Anxiety/depression	(score)	−1.974	0.665 to 2.184	0.0043	0.25814
Sex	(0. Male; 1. Female)	−9.928	−3.304 to −0.645	0.0077	**0.3100**

B: non-standardized regression coefficient. $\mathbf{r^2}$: coefficient of determination.

Table 5. Designs and results of some studies evaluating the assertive behavior (AB) and its determinants.

1st author(s)		Kobya Bulut	Hamouda	Kılıç and Sevinç	Maheshwari	Sarkova	AbdElAzim Ibrahim	Pourjali	Kimble	Present study
Reference (year of publication)		***(18)*** (2019)	***(16)*** (2018)	**(19)** (2017)	**(20, 21)** (2015)	**(17)** (2013)	**(49)** (2011)	**(22)** (2010)	**(50)** (1985)	-
Country (town)		Turkey (Trabzon)	Egypt (Benha)	Turkey (Kilis and Elazig cities)	India (Punjab)	Slovakia (Kosice)	Egypt (Port Said)	Iran (Shiraz)	USA (Texas)	Tunisia (Sousse)
Main aim: to determine the		Assertiveness and self-esteem levels and their influencing factors	Relationship between assertiveness and job satisfaction	Relationship between cultural sensitivities and assertiveness	Relationship of assertiveness and self-esteem Relationship of AB and ICSI	Associations between adolescents' AB, psychological wellbeing, and self-esteem	Factors affecting AB among student nurses	Relationships between assertiveness, the power of saying no with mental health	Differences in assertiveness related with sex, age, cultural or ethnic group, and birth order	AB levels and its predictors
Study design		Descriptive correlational	Descriptive correlational	Descriptive, cross-sectional	Exploratory correlational, cross sectional	Correlational	Descriptive analytical	Cross sectional correlational	Cross sectional analytic	Cross sectional
Fields		Nursing students	Nurses	Nursing students	Nurses	Adolescent students	Nursing students	Undergraduate students	Undergraduate psychology students	Undergraduate medical students
Sample size (M/F)		426 (80/346)	225 (0/225)	444 (126/318)	220 (11/209)	1023 (487/536)	207 (NR/NR)	120 (58/62)	782 (279/355)	125 (47/78)
Age (year)		NR	28±10[a]	21±2[a]	32±8[a]	15±1[a]	NR	NR	17-58[b]	19±1[a]
Applied questionnaires		Personal information form RAS Coopersmith self-esteem inventory	AB questionnaire Job satisfaction questionnaire	Personal form Intercultural sensitivity scale RAS	Socio demographic sheet RAS RSE scale ICSI (Com-Sat)	Scale for interpersonal behavior GHQ RSE scale	RAS 12-item to measure empowerment	RAS GHQ Power of 'saying No' questionnaire	RAS Personal information form	Sociodemographic data RAS RSE scale SF-36 ICSI GHQ
AB	**Frequency**	506%	NR	NR	NR	NR	60.4%	NR	NR	36.8%
	Value	11.51±1.59[a]	NR	112.64±15.6[a] 52 to 164[b]	-10.76±8.69[a] -36to14[b]	23.34±3.69[a]	NR	NR	**M**: 12.90±22.87[a] **F**:-4.49±23.31[a]	4.06±23.14[a] **M**: 9.64±24.05[a] **F**: 0.69±22.06[a]
	Determinants	NR	NR	Age Family income Providing care to patients whospokeforeignlanguages Willing to workabroad	Age Being graduated from public school/college Working on regular basis Working in government hospitals	Anxiety/depression Social dysfunction Positive self-esteem (only for distress dimension of assertiveness) Negative self-esteem	Residence Family income	NR	Sex Age Ethnicity	RSE global score Sending clear messages Anxiety/depression Sex

F: females. **GHQ**: general health questionnaire. **ICSI**: interpersonal communication skills inventory. **M**: males. **NR**: not-reported. **RAS**: Rathus assertiveness scale. **RSE**: Rosenberg self-esteem. **SF-36**: short-form-36. Data were: [a]Mean±standard deviation, [b]Range;

appreciation of self-worth [21]. Assertive individuals are able to claim their own rights, make requests of others, can say no to things they do not want, accept praise and can easily verbalize their feelings. All of these features increase self-esteem and ensure that individuals are satisfied with their lives (***ie***; QoL) [4]. Yet, unassertive behavior leads to a decrease in self-esteem level [4]. Benton [62] equates being assertive with being a good communicator. In fact, if a person finds it very easy to talk, if they are a very good communicator in a group, and if they find it extremely easy to maintain a conversation with a member of the opposite sex, then they are appreciated as a good communicator [63]. Undergraduate MSs, tomorrow's practitioners, will serve individuals, families and society in health care field and education. It is essential for them to acquire ABs and to be individuals with high self-esteem, in order to establish communication more comfortably and to use their professional knowledge more effectively [64].

4.1.2. AB influencing factors

Our findings pointed out that RSE global score, sending clear messages, anxiety/depression, and sex were accountable for 31% of AB scores variance (Table 4). Some previous studies had established the AB influencing factors (Table 5). According to literature, the following factors influence the ABs of students and/or nurses: age [19–21,50], anxiety/depression [17], being graduated from public school/college [20,21], ethnicity [50], family income [19,49], negative self-esteem [17], positive self-esteem (only for distress dimension of assertiveness) [17], providing care to patients who spoke foreign languages [19], residence [49], sex [50], social dysfunction [17], willing to work abroad [19], working in government hospitals [20,21], working on regular basis [20,21], mother's and father's schooling-level [19], number of family members [23], and family type [18]. The following sentences will discuss the influencing factors of ABs reported in the current study.

4.1.2.1. Self-esteem. Linear regression analysis revealed that RSE global score was accountable for 14.99% of variance in AB scores (Table 4). Findings from the present study were consistent with these of some other studies [17,21,58]. For instance, one study, including nurses, reported a positive correlation between assertiveness and self-esteem ($r = 0.272$; $p = 0.01$) [21]. Ünal [55] demonstrated that self-esteem can be enhanced by ABs, and that both had a positive correlation ($r = 0.528$, $p = 0.000$). The positive correlation between AB and self-esteem may be explained by the fact that assertive people are likely to experience a higher level of PWB and a lower level of emotional deficit compared with less assertive individuals [21].

4.1.2.2. Sending clear messages. In this study, sending clear messages was a determinant of AB (Table 4). Scientific findings reported that communication skills influence the development of ABs [49]. In fact, interpersonal communication competence develops empathy behavior; which enables individual to understand and respond to other person's feelings [49]. These characteristics are key features of ABs [49].

4.1.2.3. Anxiety/depression. Anxiety/depression subscale appeared to exert an influence on AB variance (Table 4). Rezayat and Nayeri [23] revealed an inverse correlation between assertiveness and depression in nursing students, ***ie***; the more assertive the students were, the less depressed they would be, and vice versa ($r = -0.314$; $p < 0.001$). Consequently, when there is higher assertiveness, then there would be better mental health and conversely [22]. Indeed, literature confirmed that assertiveness is a fundamental social skill, which enhances personal wellbeing and is inversely correlated with specific mental problems, such as depression/anxiety [61,65].

4.1.2.4. Sex. In the current study, sex influences AB variance, with females having lower ABs compared with males (Table 4). According to the Islamic cultural values in Tunisia, it is expected that males would be more assertive than females [58]. Indeed, the present study findings supported this expectation; then traditional male sex stereotypes seemed to be prevailing among this study sample. In the literature, the influence of sex on AB is controversial [4,18,66]. Roles and expectations imposed on persons by culture and parent attitudes are the reasons of conflicting findings for the relation between assertiveness and sex [6]. On one hand, some authors stated that assertiveness is more congruent with the male sex role stereotypes than with the female sex ones [66]. On the other hand, some authors stated that sex had no significant effect on AB of university students [18] or that females were more assertive than males [4]. In addition, one research stated that males tend to differ significantly from females in terms of 'situationally' specific ABs [67]. For instance, males reported to assert themselves more than females both in public situations and to question publicly a person of high status; while in private interpersonal settings, females tended to be more assertive. Finally, in dating situations, males reported to be less assertive when compared with females [67].

It is worth mentioning that some studies reviewed in the literature provided several AB influencing factors, which were not included in this paper (Table 5). The inclusion of these factors in further investigations might be helpful in addressing an exhaustive profile and in explaining the variation in AB scores.

4.2. Discussion of methodology

In the current study, data were collected online via Google Forms. This technique has several benefits over the offline surveys; particularly regarding speed and cost efficiency [68]. However, the low-response rate is one of online surveys main' limits [19,69]. Indeed, in this study, response rate was 40.45%. Several factors may influence response rates. These included the mode of survey (paper-based or online), engagement of students and confidentiality [68,69]. Topic salience and survey length may also influence response rates [68,69]. Salience has more influence on response rate than survey length [68,69]. In fact, if a person has little interest in the content/topic of a survey, they are unlikely to respond, no matter if the survey form is short or long [68,69]. The relatively low-response rate in the present study may be due to the online survey mode and to length of the questionnaires. In this context, study length was seen to have a negative influence on online survey response rates in that the longer the survey, the more likely the response rate will be lower. In order to resolve related issue, reminder notifications were sent to all potential MSs, since that a reminder message in e-mail survey would potentially increase response by 25% [68,69].

4.3. Study strengths and limitations

The study instruments [***ie***; RAS [34]; RSE scale [35], ICSI [36], SF-36 [37]; and GHQ-12 [38]] were widely used, reliable and valid. The sample size was estimated according to a predictive formula [48]. Determination of the optimum sample size assurances a demonstrative sample to distinguish statistical significance [40,70]. However, the sample size 'seems' small, and can therefore explain the obtained result of AB. It is possible that MSs that are more assertive were less likely to fill the survey. On the one hand, if MSs are or believe to be more assertive, then the topic seems less important to them. On the other hand, less assertive MSs may be partially aware of their limitations and therefore, viewed the study as meeting their needs/limitations. This interesting topic needs more exploration taking into account the cultural differences from one region to another. The voluntary nature of sampling might have induced a selection bias. It was preferable to conduct studies with a wider population and using probabilistic sampling methods to ensure external validity [71]. In addition, the cross-sectional design permitted neither drawing conclusions about the causal effects, nor tracking the trajectory over time. Opting for longitudinal study designs is then recommended. Finally, since the main investigator (***ie***; first author of this study) has no contact with the MSs, the hypothesis that some of them felt pressure to participate in the study is unlikely.

4.4. Perspectives

The use of assertiveness training techniques is highly advisable. Its purpose is to help MSs learn the skills to initiating and maintaining socially supportive interpersonal relationships, and consequently enjoying better emotional wellbeing [17]. It is worth mentioning that assertive relational behaviors are healthy, and are strong protective factors against mental health problems.

4.5. Conclusion

Results from this study supported that 36.8% of first-year MSs were assertive. Predictors of AB were RSE global scores, sending clear messages, anxiety/depression, and sex. These factors were accountable for 31% of AB scores variance. Targeting self-esteem and interpersonal communication skill (sending clear messages), and identifying subgroups of MSs with anxiety/depression state would influence ABs. Female MSs should particularly be targeted to improve AB among them. Overall, this preventive approach could improve health care delivery system; because today's healthy MSs are likely to become tomorrow's healthy physicians who can promote healthy lifestyles with their patients and within society.

Abbreviations' list

AB: assertive behavior
GHQ: general health questionnaire
ICSI: interpersonal communication skills inventory
MSs: medical students
PWB: psychological wellbeing
QoL: quality of life
r: correlation-coefficient
r^2: determination-coefficient
RAS: Rathus assertiveness scale
RSE: Rosenberg self-esteem
SF-36: short-form-36

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Authors' contributions

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