

Adaptation of the Brief Aggression Questionnaire (BAQ) in Greek population

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Research Article

Introduction: Brief aggression questionnaire (BAQ) is a self-administered questionnaire that measures aggression in all its dimensions. It is freely available, in its English version, in several research studies. A great advantage of the questionnaire is the small number of items included (12) and the short time to be completed. Each item is scored on a five-point scale (1 to 5), while one item is reversed.

Aim of our study is the adaptation of the brief aggression questionnaire (BAQ) in Greek population. **Method – Material:** The questionnaire was translated from English to Greek by three bilingual translators and then administered to a randomly selected group of 130 hospital staff members, 25 of whom completed it for a second time two months later.

Results: The internal consistency for the total BAQ was satisfactory (Cronbach's alpha 0.797) and moderate to high for the subscales (ranging from 0.57 for verbal aggression to 0.79 for physical aggression). A high degree of test-retest reliability between the first administration and the follow up in two months' time was identified ($F(1,24) = .171, p = .683$, Interclass Correlation Coefficient – ICC = .956).

Principal component Exploratory Factor Analysis revealed four factors: hostility, physical aggression, verbal aggression and anger, with each factor including three items. The first factor explained 18.531% of the total variance, the second 18.080%, the third 16% and the fourth was responsible for 11.598%. Confirmatory Factor Analysis with AMOS software gave acceptable global fit indices. Males scored higher on physical aggression subscale compared with females (8.28 ± 3.38 versus 5.40 ± 2.78), while no differences emerged when analyzing gender effect on the total BAQ or on the other three aggression subscales. Regarding age and education level, even though negative correlations were found between age and verbal aggression and between education level and hostility, substantial age or education level effects on the total BAQ were not apparent.

Conclusions: The Greek version of the BAQ has satisfactory properties and can be considered a valuable instrument in the primary assessment of aggressive behavior when used as a whole. Its subscales should be used with caution, due to the correlations with age and level of education. Its clinical utility should be tested in specific populations to confirm its validity.

Keywords: aggression questionnaire, psychometrics, BAQ-12

Introduction

Aggression, defined as a hostile, injurious or destructive behavior, often with the intent to cause harmful and unpleasant consequences, can be individual or collective. It can be classified by the target, such as aggression towards oneself or others, by means, such as physical or verbal, direct or indirect aggression, or by the cause, when due to neurological or psychiatric conditions. The most commonly used classification is premeditated and impulsive aggression. Impulsive aggression is also referred to as reactive or emotional aggression and is considered pathological when the aggressive response is excessive in relation to the emotional provocation, while premeditated aggression is associated with a behavior

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that is not usually in response to an immediate threat.

The causes of human aggression are multifactorial, including socio-economic, cultural, medical and psychological factors, while some forms of pathological aggression, such as impulsive aggression, have an underlying neurobiology implicating neurotransmitter systems and their regulation and structural and functional neuroanatomical findings related to the predisposition to the manifestation of aggressive behavior (1,2). Serotonin (3,4) and catecholamines are considered to play a pivotal role in the regulation of aggressive behavior, while, at the same time, the role of the GABAergic system (5) is under investigation. Numerous reports have suggested correlations between plasma testosterone concentration and aggression and its association with the male population is obvious (6), however, it seems that women who take steroids are also more aggressive (7). Low glucocorticoid levels have also been related to aggressive behavior (8), as have high glucocorticoid levels as a result of therapeutically administered medications such as dexamethasone.

Aggression can manifest in different ways, depending on the general psychopathological context in which it occurs. In the case of antisocial personality disorder, lack of empathy and frequent offending behaviors prevail. When the susceptibility is associated with coexisting cognitive impairment or disorganization with impairment of reality testing, aggression may be manifest in psychotic or highly deviant behaviors, as in murder, rape, and serial killings. Similarly, episodic aggression often accompanies patients with dementia, or epilepsy, especially of temporal or frontal origin. When aggression is coupled with emotional instability, impulsive aggression is often associated with the diagnosis of borderline personality disorder. The most important medical condition that can give rise to aggression is pain, regardless of its cause (9). The most common comorbidity, however, is substance use disorder, which contributes to both the cognitive distortions and disinhibition (10).

In any of these contexts of psychopathology, impulsive aggression can be seen as exceeding a lower threshold for activating aggressive responses to an external stimulus, without adequate reflection or regard for the aversive consequences of this behavior, which can be serious and involve - not restrictively - spousal abuse and injury, job loss, criminal assault, rape or murder. Twin and family studies suggest that aggression, especially impulsive aggression, has substantial heritability (44–72%) (11,12). Gene-environment interactions play an important role in aggression and antisocial behavior (13,14). Environmental factors comprise familial factors, including exposure to aggression in childhood and adolescence, as well as cultural and socio-economic factors. People with a biological predisposition to aggression can be particularly vulnerable in times of psychosocial adversity. For example, research has indicated that genes for the serotonin transporter and type A monoamine oxidase (MAO-A) interact with childhood maltreatment, predisposing to aggression (15).

Aggressive behaviors in the general population

peak in late adolescence and early adulthood, typically between the ages of 15 and 25, while aggressive behavior in psychiatric patients appears to peak at slightly older ages. In the general population, gender is a steady factor, with men more likely to exhibit aggressive behavior, while in people with mental disorders, gender does not seem to significantly differentiate the probability of its occurrence. Violence seems to be three times more likely in lower socioeconomic status individuals than in the higher ones. Also, the lower the level of a person's mental capacity, the greater the risk of violence. In addition, violence seems to be more likely to occur in the unemployed and the less educated. The homeless mentally disordered people commit 35 times more crimes than the general population (16,17).

As mentioned before, biological, psychological and socioeconomic factors must be taken into account when discussing the etiology of aggression. Socio-economic effects include interpersonal, social, group, economic and cultural conditions that can induce potential or real violence situations. These factors often act in conjunction. Thus, economic conditions can affect the level of aggression. Poverty, monetary inequalities and high unemployment are linked to aggression. Individual acts of violence occur in the wider social and political context. Alienated, mistreated, discriminated and marginalized individuals may be prone to expressing aggression. Some cultures and certain climates can contribute to violence. There are cultures that focus on competitiveness and such societies promote and foster violence. Still, climatic conditions can affect behavior. Warmer weather and climate have been associated with aggression (18).

United States statistics for 2012 reported 1,214,462 violent crimes nationwide. Typically, a woman was beaten every 9 seconds. On average, per minute, 20 people were physically abused by an acquaintance. Also, one in five women and one in 71 men in the United States have been raped in their lifetime. Finally, 1 in 15 children live in conditions of marital violence, while 90% of these children become witnesses to this violence. In Europe, according to Eurostat, the number of homicides in 2012 is reduced in all countries except Greece, Austria and Malta. The robberies in the period 2007-2012 more than doubled for Greece, Cyprus and Denmark. During the same years, burglaries increased in Europe by 14%, in Greece by 76%, in Spain by 74% and Italy by 42% (19,20).

Initially, research on aggression focused on situations that could act as triggers, ignoring the role of trait aggression. But despite the significant effects that these external influences can have on an individual's aggressive behavior, studies suggest that aggression remains constant over time in the same individuals. Research points to the inherent components of an aggressive disposition, since aggressive tendencies are in fact stable enough to be considered a personality trait that predicts future outcomes and behaviors. This now-accepted conceptualization of trait aggression has redefined the way researchers approach the concepts of hostility, anger, aggression and violence. The intra-familial stability of trait

aggression likely indicates the existence of genetic causal components. Confirming this assumption, a polymorphism of the gene encoding the enzyme tryptophan hydroxylase (TRH) was associated with higher levels of trait aggression (21). Because TPH partially modulates serotonin levels in the brain, individuals with this particular polymorphism have lower levels of serotonin, the neurotransmitter that predicts aggressive behavior (22). Also, according to other studies, an allele for low type A monoamine oxidase (MAOA-L) activity has been associated with an increased risk of developing trait aggression. MAOA genotype modulates the relationship between trait aggression and ventromedial prefrontal cortex (VMPFC) connectivity with supramarginal gyrus (SMG) and areas of the default mode network (DMN). In MAOA-L genotype carriers, a positive correlation between VMPFC connectivity and aggression in right angular gyrus (AG) and a negative correlation in right SMG was revealed. This result highlights the role of VMPFC in aggression in individuals with the MAOA-L genotype. It also appears that in MAOA-L carriers, aggression can be prevented in a way that depends on a synchronization of emotion regulation systems (VMPFC) with core areas of empathy (SMG) (23).

Individual differences in trait aggression can also result from changes in brain functioning, and even from structural variations. It is confirmed that trait aggression positively correlates with activation in a neural region called the dorsal anterior cingulate cortex (dACC) when individuals are confronted with an angering provocation (24). This area acts as the brain's "alarm system", detecting conflicts in the external environment (25), and also predicts higher levels of aggressive response (26). Therefore, individuals who are dispositionally-predisposed to aggress have a brain that exacerbates angering experiences, a known risk factor for aggression (27). According to the Cognitive Neoassociation Theory (CNT, 1993) (28), a single stimulus can lead to a diverse array of aggressive affect, cognition, and behavior. These aggressive responses arise by the virtue of being semantically related in a cognitive, associative framework in long-term memory. This associative framework serves as a self-reinforcing, positive feedback loop where the repeated association between aggressive concepts strengthens these semantic bonds in memory, which then makes them more readily associable. High trait aggression leads to a biased perceptual strategy in which identifying and associating aggressive concepts is a prepotent response (29).

Regardless of the etiological attributions, the fact is that human aggression can have tragic consequences. Although authorized in some cases, aggression is undoubtedly the source of many unprovoked and unjustified casualties and disasters. Therefore, understanding and predicting human aggression is very important. Trait aggression has been proposed as an important predictor of aggressive behavior in provoked and neutral situations (30). Both personality and cognitive schemas contribute significantly to aggression. Cognitive schemas were the strongest predictors of hostility which is the cognitive di-

mension of trait aggression, while anger, is the affective component, strongly predicted by personality characteristics. Aggressive behavior is separated from aggressive emotions, which include feelings of anger, hostility, and irritability. Aggressive behavior is also differentiated from aggressive cognitions, which comprise beliefs, aggressive cognitive schemas, aggressive expectations and attributions, as well as aggressive behavioral scripts (31).

In this context, the increasing need for efficient measures of aggression is understood. One of the first and most widely used measures of aggression is the Buss – Durkee Hostility Inventory scale (BDHI; Buss & Durkee, 1957) (32). The BDHI included 7 subscales and consisted of 66 dichotomously scored true/false items that assess hostility across seven subscales (Assault, Indirect, Irritability, Negativism, Resentment, Suspicion, and Verbal; it also includes a nine item Guilt subscale unrelated to the hostility items). The approach of the seven subscales seemed excessive and complicated. Thus Buss and Perry (1992) simplified BDHI by constructing its successor, the Buss-Perry Aggression Questionnaire (BPAQ) (33), with 29 questions and 4 factors: Physical aggression and verbal aggression, which can cause harm to others and which are the motor parts of aggressive behavior, anger, which causes arousal and fuels aggression, constituting the emotional part of the behavior and at the same time acts as a bridge between the motor and the cognitive part of aggressive behavior, and, finally, hostility, which is characterized by reduced levels of judgment and is the cognitive part of aggressive behavior. The BDHI and BPAQ questionnaires assess the direct rather than the displaced form of trait aggression. The Buss & Perry questionnaire was modified by Bryant and Smith (2001) (34), while in 2014 a short form with 12 questions was developed, the BAQ (Brief Aggression Questionnaire) (35).

Purpose of the present study is the adaptation of the brief aggression questionnaire (BAQ) in the Greek population.

Methods – Material

Participants and Procedure

Brief Aggression Questionnaire (BAQ) was administered to a randomly selected group of 130 hospital staff individuals (46 men and 59 women, with a mean age of 40.24 ± 11.72 years and a mean level of education 15.97 ± 3.1 years). 25 of them completed it for a second time two months later.

Additionally BAQ was administered to:

- 100 patients diagnosed with schizophrenia F20, per ICD-10 (37 hospitalized – 17 men and 20 women, with a mean age of 39.97 ± 13.11 years and 63 outpatients-28 men and 35 women, with a mean age of

42.73±8.988 years).

- 88 volunteers (51 men and 37 women, with a mean age of 46.81±8.8), members of the Greek methadone and buprenorphine maintenance programs of the Organisation Against Drugs (OKANA) in Athens.
- 247 healthcare personnel (53 men and 194 women with a mean age of 41.69± 9.437 years) and
- 115 individuals from the general population (12 men and 103 women with a mean age of 41.76± 9.2 years).

Assessment Tools

Brief Aggression Questionnaire (BAQ)

The Brief Aggression Questionnaire (BAQ) is a 12 item self-report measure of trait aggression. The questionnaire asks participants to rate on a scale from 1 (strongly agree) to 5 (strongly disagree), the degree to which statements describing behaviors and emotions, are characteristic of themselves. The AQ measures aggression in the domains of physical aggression, verbal aggression, anger, and hostility. The questionnaire was translated and back translated, from English to Greek and vice versa, by three bilingual translators. BAQ has been proposed as a valid and reliable instrument (Webster et al., 2014), with adequate temporal stability and convergent validity with other behavioural measures of aggression (36).

Past Feelings and Acts of Violence Scale (PFAV)

The PFAV was developed in order to assess risk of violence (physical aggression). Participants rate each of 12 items on a scale from 1 (never) to 4 (very often). The first three items assess frequency of anger; the next six items assess frequency of violent behaviors and accessibility of weapons. Items 10 and 11 ask about history of aggressive and non aggressive criminal behavior and the final question asks if the person keeps weapon at home and know how to use them. The authors found that a score of 5 on the PFAV provided 71% specificity and sensitivity in identifying psychiatric patients as violent versus nonviolent (37).

Dimensions of Anger Reactions (DAR-5)

The DAR-5 is a 5-item scale that measures anger experience over the past 4 weeks. Respondents rate their anger experience on a 5-point scale ranging from 1 ('None or almost none of the time') to 5 ('All or almost all of the time'). The five scores are summed, with a total DAR-5 score ranging from 5 to 25. Higher scores indicate more severe anger experiences. The original English scale showed excellent internal validity (Cronbach's α .86 – .91) and was found to capture a single fac-

tor of anger experience constituted by five anger reactions (i.e. frequency, intensity, duration, interpersonal aggressiveness, and interference with interpersonal relationships). A screening cut-off point of 12 on the DAR-5 successfully differentiated high and low scorers (38).

Statistical analysis

All analyses were performed using the Statistical Package for the Social Sciences (SPSS) version 24: descriptive statistics, correlation analysis, internal consistency and exploratory factor analysis (EFA). Normality was tested by the Kolmogorov-Smirnov test. Confirmatory factor analysis was conducted with the use of AMOS software, in order to explore the factor structure of the instrument as suggested by the EFA analysis. A "receiver operating characteristics" (ROC) curve was obtained to evaluate the diagnostic properties of the questionnaire.

Results

Internal consistency

The internal consistency for the total BAQ was satisfactory (Cronbach's alpha 0.797) and moderate to high for the subscales (0.57 for verbal aggression and 0.79 for physical aggression, table 1). The internal consistency for the total BAQ was confirmed after administering the questionnaire to other samples (table 2).

Test-retest reliability

25 out of 130 participants completed the questionnaire for a second time, after two months. No statistically significant differences between the two scores were identified. A high degree of test-retest reliability between the first administration and the follow up in two months' time was identified ($F(1,24) = .171, p = .683$, Interclass Correlation Coefficient – ICC = .956).

Concurrent validity – Known groups' validity

The Aggression Questionnaire BAQ was administered to 88 volunteers (51 men and 37 women, with a mean age of 46.81±8.8), members of the Greek methadone and buprenorphine maintenance programs of the Organization Against Drugs (OKANA). Mean value in BAQ in the sample of OKANA participants was significantly higher than the mean value of the 130 hospital staff sample (33.88±9.49 versus 29.15±8.8, independent samples test, $p=0.000$, table 6). BAQ was also administered to 100 patients diagnosed with schizophrenia F20, per ICD-10 (37 hospitalized – 17 men and 20 women, with a mean age of 39,97±13,11 years and 63 outpatients-28 men and 35 women, with a mean age of 42,73±8,988 years). Mean value in BAQ in the sample of hospitalized

patients (33.65 ± 8.297) was significantly higher than the mean value of the 130 hospital staff sample (independent samples test, $p=0.006$) and significantly higher than the mean value of the outpatients' sample (29.33 ± 7.849 , independent samples test, $p=0.011$).

Convergent validity

BAQ and PFAV were simultaneously administered to 88 volunteers (51 men and 37 women), members of the Greek methadone and buprenorphine maintenance programs of the Organization Against Drugs (OKANA). Significant positive correlations were evidenced between scores on BAQ and PFAV (Pearson correlation $r = .594$, $p = .000$, tests of Normality Kolmogorov-Smirnov $p > 0.05$).

Also, BAQ and DAR-5 were simultaneously administered to 247 healthcare personnel (53 men and 194 women) and significant positive correlations were evidenced between scores on the two scales (Pearson correlation $r = .409$, $p = .000$, tests of Normality Kolmogorov-Smirnov $p > 0.05$). Similarly, both scales were simultaneously administered to 115 individuals from the general population (12 men and 103 women) and significant positive correlations were also evidenced between these scores (Pearson $r = .375$, $p = .000$, tests of Normality Kolmogorov-Smirnov $p > 0.05$).

Screening properties and choice of optimal cut-off point

A "receiver operating characteristics" (ROC) curve was obtained in order to illustrate the discriminative properties of the aggression questionnaire BAQ, in a sample of 88 volunteers, members of the Greek methadone and buprenorphine maintenance programs of the Organization Against Drugs (OKANA), who were divided in two groups based on their scores on PFAV scale (cutoff PFAV ≥ 5). In graph 1, y axis displays the sensitivity of the questionnaire (the likelihood of a person being diagnosed with aggression when really being aggressive) and axis x (1 minus) represents the specificity of the questionnaire (the probability of a non aggressive individual being wrongly diagnosed with aggression). The area under the curve is an index of the diagnostic properties of the questionnaire, which in our study, is satisfactory, AUC = 0.76 (Graph 1). The diagonal in the graph shows the curve that we would have if the questionnaire had no diagnostic value (the diagnosis of aggression was random). Also, grouping based on the score in the questionnaire is better than the random classification of individuals in these with aggression and those without aggression ($p = .000$, standard error = .060). Optimal discrimination was obtained at a cut-off score of 29.5 (sensitivity 0.746, specificity 0.667). Therefore, a person with a score equal to or greater than 29.5 has a 74% chance of being aggressive (and correctly diagnosed as such), while there is a 33% chance of not being aggressive (and being misdiagnosed with aggression).

Construct validity

Exploratory factor analysis

After testing for normality of distribution of continuous variables by the Kolmogorov-Smirnov test ($p > 0.05$), exploratory factor analysis (EFA), for the factor structure of the questionnaire was implemented. The assessment of the sampling adequacy diagnostics led to satisfactory MSA values (0.687 to 0.851). Furthermore, Bartlett's test of sphericity (chi-square = 416.549, $df=66$, $p=0.000$) indicated that the intercorrelations were satisfactory, while the KMO measure was high (0.76) and determinant was 0.030, indicating partial intercorrelations among items. The above findings support the existence of possible latent factors. Principal component factor analyses (PCA) with varimax rotation was performed and the retained items were those with eigenvalues > 1 , according to Kaiser's criterion in combination with the scree plot test (figure 2). Four factors existed explaining the 64,215% of the total variance: The first factor was responsible for the 18.531% of the total variance, the second for the 18.080%, the third factor for the 16% and the fourth for the 11.598% (table 5). The first factor identified as hostility consisted of the items 2,8,9 the second identified as physical aggression consisted of the items 1,5,10 the third identified as verbal aggression consisted of the items 3,6,11 and the fourth identified as anger consisted of the items 4,7,12 (table 4).

Confirmatory Factor analysis

Confirmatory factor analysis (CFA) was conducted with the use of AMOS software in order to explore the factor structure of the questionnaire as suggested by the EFA analysis and evaluate the fit of the model compared to the null (or independence) model. Results suggest that the measures of fit of the model were satisfactory, indicating adequate fit (CMIN/ $df = 1.425$, Comparative Fit Index CFI = .945, Normed Fit Index NFI = .842, Parsimonious Normed Fit Index PNFI = .612, Incremental Fit Index IFI = .95, Tucker-Lewis Index TLI = .94 and the Root Mean Square Error of Approximation RMSEA = .05) (graph 3). CFA was also applied in the sample of 115 individuals from the general population and the resulting global fit indices were acceptable: CMIN/ $df = 1.059$, $p = .363$, Comparative Fit Index CFI = .982, Incremental Fit Index IFI = .984, Tucker-Lewis Index TLI = .975 the Root Mean Square Error of Approximation RMSEA = .023.

Differences as to gender – correlations with age and level of education

Males scored higher on physical aggression subscale compared with females (8.28 ± 3.38 versus 5.40 ± 2.78 , T test $p < 0.01$, table 7), while no differences emerged when analyzing gender effect on the total BAQ

or on the other three aggression subscales.

Regarding age and education level, even though negative correlations were found between age and verbal aggression and between education level and hostility ($r = -.21$, $p = .02$ και $r = -.19$, $p = .03$, correspondingly, table 8), substantial age or education level effects on the total BAQ were not apparent.

Discussion

The results of the present study revealed that the Greek version of the Brief Aggression Questionnaire (BAQ) had satisfactory psychometric properties, with adequate internal consistency and quite satisfactory concurrent and convergent validity and these findings support the applicability of the Greek version of BAQ within the Greek population. Regarding reliability, Cronbach's alpha coefficients were satisfactory for the total BAQ, in both times (baseline and reassessment), across all samples studied. Indices of convergent validity resulting from correlations with scales assessing physical aggression and anger were in the expected direction.

Mean scores and standard deviations for all factors of the questionnaire in the sample of 130 hospital staff members were in line with findings from other research studies attempting to standardize the questionnaire (35, 36). Scores were substantially higher in the sample of the members of the Greek methadone or buprenorphine maintenance programs of the Organisation Against Drugs and in the sample of hospitalized schizophrenic patients. The association between substance abuse and aggressiveness is undoubtedly complex, although literature suggests that aggressive personality traits may predate addictive behavior (39, 40). As to the higher scores in the sample of hospitalized schizophrenic patients, we are aware that psychotic patients in the acute phase or in acute relapses of the disorder may present with severe aggression and violence (41).

From exploratory factor analysis four factors explaining 64.215% of the total variance emerged. All items loaded at .50 or greater on their expected factors with one exception, the item: 'Sometimes I fly off the handle for no good reason', which loaded more strongly on Verbal Aggression (.514) than its predicted factor, Anger (.314). The same was observed in the adaptation of the questionnaire by its designer (35), where the exception was the item: 'My friends say that I'm somewhat argumentative' which loaded more strongly on Anger (.54) than its predicted factor, Verbal Aggression (.44). It seems that in other attempts to standardize the questionnaire the same difficulties were evidenced with its loadings. An example is the item "Sometimes I fly off the handle for no good reason', which in yet another research study, loaded more strongly on Hostility than on its predicted factor, Anger (42). Due to these observed cross-loadings it is recommended that the questionnaire be used as a whole and not by distinct factors. This is also supported by the displayed negative correlations between age and verbal

aggression and between education level and hostility.

As to the screening properties of the questionnaire, maximal discrimination between individuals with and without trait aggression was obtained at a cut-off score of 29.5. However, it should be noted that while the sensitivity of this cut-off score is fair (there is a 74.6% probability that someone with trait aggression will be diagnosed correctly), its specificity is not satisfactory (as there is a 33% chance that someone without trait aggression will be misdiagnosed with trait aggression). Nevertheless, this score was chosen because high sensitivity is required for the screening purposes of the questionnaire, aiming to detect individuals with increased probability to display aggressive behavior, as an initial diagnostic tool. After all, the exact diagnosis will be likely obtained through further clinical investigation.

Conclusions

In conclusion, the Greek version of the Brief Aggression Questionnaire (BAQ) when used as a whole, presents a coherent structure with adequate internal consistency and quite satisfactory concurrent and convergent validity. These findings support the applicability of the Greek version of BAQ within the Greek population, and future studies could further explore the relevance of the questionnaire with other scales and outcomes, as well as its predictive validity.

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Appendix

Tables 1 & 2: Internal consistency

	Number of Items	Cronbach Alpha N=125
BAQ	12	0.797
Physical aggression	3	0.791
Hostility	3	0.664
Verbal aggression	3	0.573
Anger	3	0.634

	Cronbach Alpha
N=100*	0.731
N=88**	0.740
N=247***	0.761
N=115****	0.690

* 100 patients diagnosed with schizophrenia F20, per ICD-10 (37 hospitalized – 17 men and 20 women, with a mean age of 39.97±13.11 years and 63 outpatients-28 men and 35 women, with a mean age of 42.73±8.988 years).

** 88 volunteers (51 men and 37 women, with a mean age of 46.81±8.8), members of the Greek methadone and buprenorphine maintenance programs of the Organisation Against Drugs (OKANA) in Athens.

*** 247 healthcare personnel (53 men and 194 women with a mean age of 41.69± 9.437 years) and

**** 115 individuals from the general population (12 men and 103 women with a mean age of 41.76± 9.2 years).

Table 3: Test - re-test reliability

Test- retest reliability Paired Samples Statistics (N=25)		MEAN VALUES	STANDARD DEVIATIONS	STANDARD ERRORS	p value
1 ST EVALUATION	BAQ	29.96	11.341	2.268	.683
2 ND EVALUATION		30.3600	12.30474	2.46095	
1 ST EVALUATION	Physical aggression	7.20	3.686	.737	1.000
2 ND EVALUATION		7.20	3.69685	.73937	
1 ST EVALUATION	Hostility	7.04	3.611	.722	.714
2 ND EVALUATION		7.12	3.68917	.73783	
1 ST EVALUATION	Verbal aggression	9.20	3.452	.690	.753
2 ND EVALUATION		9.12	3.46795	.69359	
1 ST EVALUATION	Anger	6.52	3.043	.609	.161
2 ND EVALUATION		6.92	3.31562	.66312	

Table 4: Exploratory Factor Analysis - Loadings

ITEMS	Hostility	Physical aggression	Verbal aggression	Anger
baq8	.792	-.007	.152	-.062
baq9	.704	.340	.045	-.067
baq2	.678	.140	-.156	.264
baq5	.144	.885	.105	.079
baq10	.213	.834	.261	-.045
baq1	.037	.664	.101	.412
baq6	-.111	.151	.751	-.007
baq11	.341	.058	.660	.067
baq3	-.022	.175	.647	.103
baq12	.477	-.001	.514	.314
baq4	-.008	.085	.073	.865
baq7	.466	.225	.305	.522

Extraction Method: Principal Component Analysis.
 Rotation Method: Varimax with Kaiser Normalization.

Table 5: Eigenvalues and total variances explained

FACTORS	INITIAL EIGENVALUES			ROTATION SUMS OF SQUARED LOADINGS		
	EIGENVALUES	% OF VARIANCE	CUMULATIVE %	EIGENVALUES	% OF VARIANCE	CUMULATIVE %
1	3.834	31.954	31.954	2.224	18.531	18.531
2	1.469	12.238	44.192	2.170	18.080	36.611
3	1.327	11.061	55.253	1.921	16.006	52.617
4	1.075	8.962	64.215	1.392	11.598	64.215
5	.802	6.686	70.901			
6	.730	6.080	76.981			
7	.712	5.937	82.918			
8	.549	4.572	87.490			
9	.484	4.035	91.525			
10	.436	3.635	95.160			
11	.369	3.078	98.238			
12	.211	1.762	100.000			

Extraction Method: Principal Component Analysis.

Table 6: Descriptive statistics of continuous variables (BAQ and factors)

	N	MIN	MAX	MEAN	STANDARD DEVIATION
BAQ	125	12.00	56.00	29.1520	8.81719
PHYSICAL AGGRESSION	125	3.00	15.00	6.4640	3.31308
HOSTILITY	125	3.00	15.00	6.9440	3.05145
VERBAL AGGRESSION	125	3.00	15.00	9.0960	3.07284
ANGER	125	3.00	13.00	6.6480	2.86879

Table 7: Descriptive statistics of continuous variables (BAQ and factors) as to gender

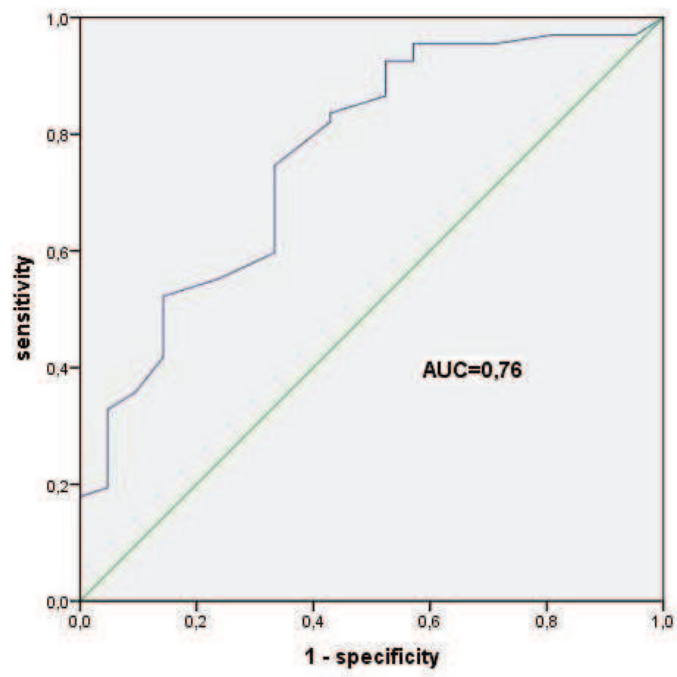
		N	MEAN VALUE	STANDARD DEVIATION	STANDARD ERROR
BAQ	1	46	30.9783	9.00491	1.32770
	2	79	28.0886	8.58471	.96585
PHYSICAL AGGRESSION	1	46	8.2826	3.38403	.49895
	2	79	5.4051	2.78512	.31335
HOSTILITY	1	46	6.5870	2.74531	.40477
	2	79	7.1519	3.21490	.36170
VERBAL AGGRESSION	1	46	9.3478	2.81439	.41496
	2	79	8.9494	3.22211	.36252
ANGER	1	46	6.7609	2.86112	.42185
	2	79	6.5823	2.88945	.32509

1: MEN / 2: WOMEN

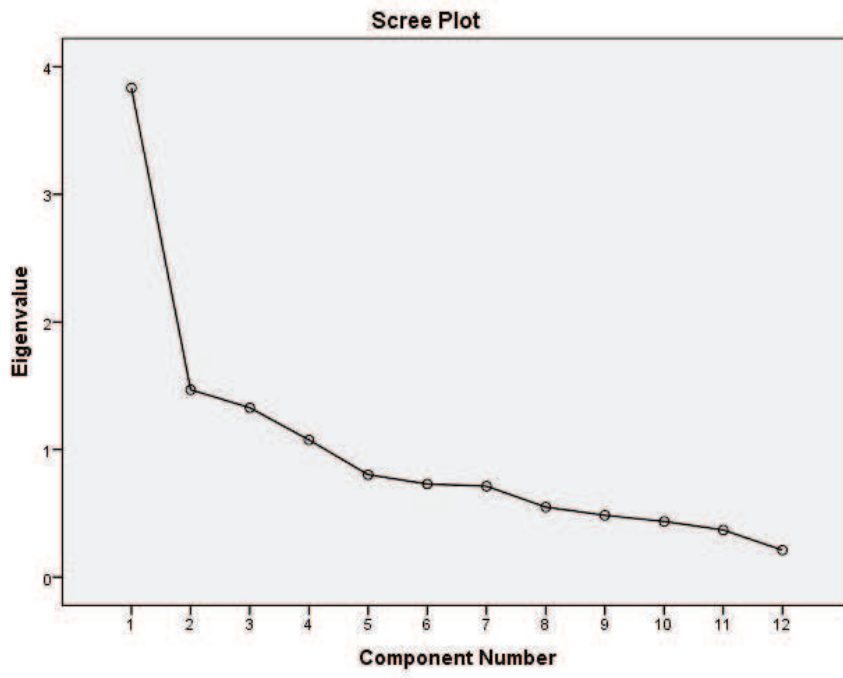
Table 8: Correlations of BAQ and factors scores with age and level of education

		EDUCATION IN YEARS	AGE	BAQ	PHYSICAL AGGRESSION	HOSTILITY	VERBAL AGGRESSION
AGE	r	0.012					
	p	0.89					
BAQ	r	-0.09	-0.09				
	p	0.33	0.29				
PHYSICAL AGGRESSION	r	0.02	-0.11	0.74**			
	p	0.86	0.20	0.00			
HOSTILITY	r	-0.19	0.05	0.68**	0.33**		
	p	0.03*	0.57	0.00	0.00		
VERBAL AGGRESSION	r	-0.04	-0.21*	0.69**	0.35**	0.20**	
	p	0.70	0.02	0.00	0.00	0.00	
ANGER	r	-0.48	0.01	0.76**	0.40**	0.42**	0.41**
	p	0.60	0.91	0.00	0.00	0.00	0.00

Graph 1: Receiver operating characteristics" (ROC) curve for the discriminative properties of the aggression questionnaire BAQ



Graph 2



Graph 3: Confirmatory factor analysis of the Greek BAQ

