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## **The Modulating Role of Gender and Aggression in Emotional Reactions of Nursing Students: A Cross sectional Study**

Running Head: The Role of Gender and Aggression in Emotional Reactions of Nursing Students

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**Author Contribution:**

<b>Criteria</b>	<b>Author Initials</b>
Made substantial contributions to conception and design, or acquisition of data, or analysis and interpretation of data;	MM, SDC, GP, EF
Involved in drafting the manuscript or revising it critically for important intellectual content;	MM, EF
Given final approval of the version to be published. Each author should have participated sufficiently in the work to take public responsibility for appropriate portions of the content;	MM, SDC, GP, EF
Agreed to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.	MM, SDC, GP, EF

**Aims:** To examine whether and to what extent emotion reactions of nursing students are affected by emotional features inherent in nursing care situations, focusing on gender and aggression.

**Background:** How individual characteristics of nurse students interact with emotional demands inherent in nursing practice and modulate the way they are perceived and acted on may have an impact on quality of patient care.

**Design:** Cross sectional study, conducted from May – September 2013.

**Method:** Nursing students (N=157) of the Nursing Degree Course of School of Medicine, Bologna University, completed self-report questionnaires assessing individual differences (i.e., aggression, personality traits, empathy) and evaluated emotion inducing pictures of pleasant, unpleasant and neutral content.

**Results:** Gender and verbal aggression level modulate emotional responses of nursing students: females rated negative picture categories as significantly less pleasant than male students; those with high compared with low verbal aggression levels rated negative stimuli as less arousing and more pleasant. Verbal aggression level is positively related to physical aggression and anger and negatively related to emotional stability and empathy in both males and females.

**Conclusion:** High verbal aggression scores seem to be associated with attenuated arousal in response to emotional stimuli and decreased aversive reaction towards negative content pictures, indicating a potential facilitation of approach and management of adverse events strictly connected to nursing practice. Nonetheless, aggression can represent a risk factor in nursing practice. Negative implications of verbal aggression are highlighted together with the need for tailoring education programs aimed at enhancing emotion regulation and aggression management skills in nursing context.

**KEY WORDS:** nursing students, emotional reactions, aggression, personality traits, gender differences, empathy

## **SUMMARY STATEMENT**

### **Why is this research or review needed?**

- How levels of aggression interact with gender, individual traits and characteristics of emotional stimuli in the nursing context remains unaddressed by current research.
- We examined whether and to what extent gender and aggression level of nursing students modulate the way they evaluate (negative) emotional information, with potential implications for behavioral outcomes and quality of nursing care.

### **What are the key findings?**

- Gender and verbal aggression level modulate emotional responses of nursing students.
- High verbal aggression level seems to be associated with decreased aversive reaction towards negative content stimuli, suggesting a potential facilitation of approach and management of adverse events.

- Nonetheless, verbal aggression level is negatively related with emotional stability and empathy, potentially increasing the risk of both nurses' distress and patient neglect.

### **How should the findings be used to influence policy/practice/research/education?**

- Sensitizing future nurse professionals on the emotional impact of work-related exposure to negative stimuli should be the focus of formal education programs.
- Specific skill building trainings should also be put in place assisting future nurses on how to regulate their emotions, manage stress and constructively cope with adverse situations.

### **Impact Statement**

- While verbal aggression might, quite surprisingly, help to cope with adverse situations, negative impact of aggression on both nurses' emotional distress and patient care should not be underestimated.
- Providing instruments and tools to nurses for on-going self-monitoring and self-evaluation is crucial to prevent and lower the incidence of burnout, aggression and patient neglect among the nurse workforce.
- Training programs should be aimed to increase emotional awareness and capability of overt recognition of anger and aggression, enhancing assertiveness and empathy.
- Considering that nursing is a predominantly female workforce, this subgroup of nurse professionals should be sensitized to the impact that covert forms of expression of anger and aggression could have on interpersonal relations in the workplace and on developing burnout, with implications for both their health and patient care.

## **1. INTRODUCTION**

Nursing is considered an emotionally demanding profession (Filstad, 2010). Nurses are continuously exposed to emotionally charged situations and are required to deliver compassionate care often in adverse conditions (Bolton, 2001). Not only are they expected to regulate their own emotions to practice, they are also required to assuage the fear and distress of patients and family relatives alike (Diefendorff, Erickson, Grandey & Dahling, 2011). The pressure to regulate one's emotion reactions and offer quality care becomes even more challenging in the context of high interpersonal aggression rates encountered in healthcare settings (see Hopkins, Fetherston & Morrison, 2018 for a recent review). Indeed nurses have the highest exposure to aggression by patients, family members, visitors, fellow colleagues and other healthcare professionals (Budin, Brewer, Chao & Kovner, 2013; McLaughlin, Gorley & Moseley, 2009; Thomas & Burke, 2009; Curtis, Bowen and Reid, 2007). Therefore, managing one's emotions effectively and responding adequately to those of others is not only imperative, but also challenging in this line of work (Leonard, 2017; Por, Barriball, Fitzpatrick & Roberts, 2011; Williams, 2012). While negative effects of interpersonal aggression in healthcare settings have been widely documented (Hopkins *et al*, 2018; Roche, Diers, Duffield & Catling-Paull, 2010; Schablon *et al*, 2012), little is known about how aggression may influence emotion reactions in nursing professionals.

### **1.1 Background**

Research on emotion processing has shown that emotional information differs with respect to how it is perceived and evaluated, demonstrating the primacy of dimensions of pleasure and arousal (see Bradley & Lang, 2007; Lang & Bradley, 2010). How emotional stimuli are perceived and evaluated has an impact on consequent behavior in terms of approach for

pleasant and avoidance for unpleasant stimuli: the higher the arousal of positive or negative stimuli, the more effective the neurophysiological (cerebral, autonomic and motor) response, aimed to sustain appetitive (approach) or defensive (avoidance) behaviors respectively (Lang, Bradley and Cuthbert, 1997; Lang & Bradley, 2013). Applied to the healthcare setting, important implications can be drawn for nursing professionals as they are called by duty to ‘subvert’ the natural approach/avoidance tendencies inherent in human motivation. That is, nurses are required to proactively approach (instead of avoiding) stimuli or situations that may otherwise be considered as highly aversive. For instance, stimulus categories like mutilations and incidents, which are evaluated as the most unpleasant stimuli by normal population worldwide and commonly activate avoidance tendencies in normal people (Bradley & Lang, 1994) represent professionally salient stimulus categories most frequently encountered in nursing practice. Yet, whether nurses’ emotional reactions to such stimulus categories are different compared with normal populations has not received enough attention in current research.

Evidence shows that new graduates and first year nurses are particularly vulnerable to the emotional demands of nursing practice, as they are to negative effects of workplace aggression (Budin *et al*, 2013; Erickson & Grove, 2008; Cooper & Curzio, 2012; McKenna, Smith, Poole & Coverdale, 2003). Most studies on aggression in nurses have highlighted situational factors inherent in high stress environments like the operating room, emergency unit (Findorf, McGovern, Wall, Gerberich & Alexander, 2004), or individual level factors, showing that verbal aggression is most typically encountered in healthcare settings (Laschinger, Grau, Finegan & Wilk, 2010). Contemporary models on aggression instead (i.e., The General Aggression Model, GAM Anderson & Bushman, 2002; see Robertson, Daffern & Bucks, 2012 for a recent review) consider the dynamic relationship between elements inherent in the interaction between a person and a given situation (referred to as inputs, routes

and outcomes). Inputs are factors that may influence one's predisposition to aggression, which may be related to the person (such as personality traits, sex, beliefs, attitudes, values and long-term goals) or the situation (such as aggressive cues or presence of threats). Both types of factors may influence an individual's internal state via cognitive, affective and physiological (arousal) routes, which interrelate and include a series of appraisals and decision processes that determine the final outcome in terms of predisposition to, or actual action (Robertson *et al.*, 2012). This model is particularly relevant for nurses since individual differences (i.e., personality traits) may interact with characteristics inherent in emotionally charged situations that nurses face daily and influence the way they are perceived and evaluated, with potential consequences for behavioral outcomes (Filstad, 2010).

Since nursing is a profession where females predominate, a gender perspective (Jack, 1999) proposes that women generally cope with anger and frustration in less aggressive ways compared with men and that aggression among women arises mainly from failures in relationships with other people. Jack (1999) portrayed the many forms that aggression can take, from overt aggression to passive or indirect expressions and concluded that women might mask their aggression through manipulation, silence and exaggerated sweetness. These gender differences are confirmed by recent reviews on aggression in different settings and cultures (Björkqvist, 2018). The fact that women tend to respond with more covert reactions to negative stimuli, however, does not necessarily mean that their subjective perception of aversive stimuli is less negative. Rather, it may indicate a learned response on part of females in front of aversive situations. Indeed, findings regarding the emotional responses in general population (Bradley *et al.*, 2001) show that women tend to have a broad disposition to respond with greater defensive reactivity (i.e., avoidance response) to aversive pictures, regardless of their content, rating as more unpleasant than men scene of aggressions, weapons and mutilations. These data seem to suggest that female nurses particularly might experience



a large amount of subjective stress, in response to their daily professional context. Individual characteristics like personality traits or empathy levels might play a modulating role, especially in terms of contrasting aggression tendencies (Song *et al.*, 2018). Specifically, in healthcare profession, empathy and emotional intelligence in general may represent a protective trait to efficiently cope with stressful situations. Indeed, a recent study (Štiglic *et al.*, 2018) found that emotional intelligence was higher in nursing than engineering students and slightly higher in women than men. How levels of aggression interact with gender, individual traits and characteristics of emotional stimuli in the nursing context remains unaddressed by current research.

## **2. THE STUDY**

### **2.1 Aim**

The aim of this study was to examine whether and to what extent individual differences (i.e., gender and aggression level) of nursing students modulate the way they perceive and evaluate emotional information, with potential implications for behavioral outcomes and quality of nursing care. We expected that level of Aggression (assessed by the Aggression Questionnaire, Buss & Perry, 1992) and Gender (males vs. females) would determine different ratings of valence and arousal of emotional stimuli (representative of natural scenes), in particular for unpleasant content such as mutilation and incidents. Specific hypothesis were that a) more aggressive students would rate as more pleasant negative stimuli compared with less aggressive subjects and b) that females would evaluate these stimuli as more unpleasant compare to males. In addition, we investigated whether Aggression level of male and female students is correlated with other personality traits (assessed by Big Five Questionnaire, BFQ, Caprara, Barbaranelli, Borgogni & Perugini,

1993) and individual empathy (assessed by Interpersonal Reactivity Index, IRI, Davis, 1980; Albiero, Ingoglia & Lo Coco, 2006).

## **2.2 Design**

A cross-sectional design was adopted, with two between-subjects and one within-subjects factors. The study was conducted at Bologna University, on first year students pursuing a bachelor's degree in nursing at the School of Medicine and Surgery.

## **2.3 Sampling and recruitment**

A hundred and fifty-seven nursing students attending lectures through May - September 2013, at the Nursing Degree Course of School of Medicine and Surgery, University of Bologna, Italy, participated voluntarily in the study. Participation was open to all freshmen students (N= 250) and recruitment was carried out before one of scheduled lectures in general psychology, by explaining the study procedure and eliciting participation voluntarily. Only those who satisfied the following inclusion criteria were selected: age range between 19-35, living in Italy and able to read and understand Italian language and not presenting any neurological or psychiatric conditions. Inclusion and exclusion criteria were checked by one of the experimenters in a one-to-one interview session with each student expressing interest to participate. Finally, at the end of selection process, our sample included 157 freshmen students (123 females, 34 males) at the initial stage of the training process, with no prior exposure to nursing practice. The minimum total sample size a priori computed by G Power software for expected significant interactions (with  $p=0.05$  and actual power = 0.95) was 28 participants.

## **2.4 Data collection and Ethical consideration**

The study involved presentation of 24 emotional stimuli of different picture content (see Materials). Participants were asked to view each of the pictures carefully and evaluate them on a paper and pencil response sheet for perceived pleasantness and arousal on a 9-point scale, ranging from 1 (not at all pleasant/arousing) - 9 (extremely pleasant/arousing). Each picture was presented for six seconds, projected centrally on a screen in front of the subject and the size of the slide image was approximately 1.2 m x 1.8 m. The picture presentation order was pseudo-randomized for picture content; that is, no more than two pictures with the same content were presented consecutively. The task started with three practice trials for the participants to familiarize with the procedure. The procedure was first verbally explained and then each participant provided written informed consent.

The study was approved by the Council of the Nursing Degree Course and the Ethics Committee of University of Bologna. Students were free to decline participation without any consequence, at any stage of the data collection. Following data collection, time was allowed for questions and discussion with the researcher to resolve any strong feelings that had been elicited.

## **2.5 Measures**

### ***2.5.1 Emotion reactions***

To measure emotion reactions, we used a series of emotion-inducing stimuli selected from the International Affective Picture System (IAPS; Lang, Bradley & Cuthbert, 2008). Stimuli were 24 color photographs including six content categories (two pleasant, two unpleasant and two neutral), with different normative ratings for valence and arousal. Eight pleasant pictures included four scenes of arousing sports [e.g. ice climbing, parachuting, cliff diving, skiing

(mean valence 7.03, mean arousal 6.55)] and four images of foods [e.g. hamburger, shrimp cocktail, cupcakes, cakes (mean valence 5.98, mean arousal 5.05)]; eight unpleasant pictures included four scenes of mutilations (i.e. surgical wounds and scenes from autopsies such as open chest, hand wound, body injury, face wound (mean valence 1.45, mean arousal 7.26)] and four pictures of incidents (i.e. car crashing, tornado, fire scene, fire accident (mean valence 2.78, mean arousal 5.22)]; eight neutral pictures included four scenes of persons [i.e., factory worker, cashier, secretary, doing grocery (mean valence 5.80, mean arousal 3.24)] and four urban scenes. [i.e., auto grill, trucks, street view, trains (mean valence 4.81, mean arousal 3.71)].

### **2.5.2 Aggression and individual differences**

To assess individual differences in aggression level we used the Aggression Questionnaire (AQ, Buss & Perry, 1992; Italian validation: Fossati, Maffei, Acquarini & Di Ceglie, 2003). The AQ questionnaire consists of 29 items evaluating four dimensions related to four subscales: Physical Aggression (9 items), Verbal Aggression (5 items), Anger (7 items) and Hostility (8 items).

We further used the short form of Big Five Questionnaire (BFQ, Italian validation: Caprara *et al.*, 1993) to assess individual differences in personality traits. The BFQ is the most widely used measures of the Big Five personality dimensions in the Italian context and is aligned with other Big Five measures (Barbaranelli, Caprara & Maslach, 1997). The short form of the BFQ consists of 60 items, with 12 items for each dimension: (1) Energy/Extraversion; (2) Agreeableness; (3) Conscientiousness; (4) Emotional Stability; (5) Openness.

Lastly, we used the Interpersonal Reactivity Index (IRI, Davis, 1980; Italian validation: Albiero *et al.*, 2006). It is used to measure empathy based on a multidimensional approach. It includes 28 items that yielding 4 subscale scores: a. Perspective taking (PT); b. Fantasy scale (FS); c. Emotion Concern (EC); d. Personal Distress (PD).

## **2.6 Statistical Analysis**

The data collected in the study were analyzed with SPSS Statistics 21. Descriptive statistics were carried out on demographic and psychometric scales. For each AQ subscales (i.e., Physical Aggression, Verbal Aggression, Anger and Hostility), two groups of participants were created, according to their individual score: subjects with a score above mean value were assigned to the high aggression level group, whereas subjects with a score below mean value were assigned to the low aggression level group. Then, for each of the four pairs of groups based on each AQ subscale, the following analyses were performed: Pleasantness and Arousal ratings obtained in the evaluation task were analyzed by means of separate three-way ANOVAs, taking Group (low aggression level vs. high aggression level) and Gender (females vs. males) as between factors and Picture Category (arousing sports, foods, neutral persons, urban scenes, mutilation and incidents) as within-subjects factor. Significance level was fixed at  $p < 0.05$ . Pairwise comparisons, with  $p$  value adjusted by Bonferroni correction were used to further analyze significant interactions between factors. Finally, to examine whether Aggression was related to specific individual traits of nursing students, correlation coefficients (Pearson's  $r$ ,  $p < 0.05$ ) were computed between individual scores of AQ, BFQ and IRI subscales, both on whole sample and separately for male and female nurse students.

## **2.7 Validity, reliability and rigour**

All measures used in the study were previously validated for Italian population, showing good psychometric properties of external validity and internal consistency reliability (Albiero *et al.*, 2006; Barbanelli *et al.*, 1997; Fossati *et al.*, 2003). In addition, the Cronbach alpha coefficient (Cronbach, 1951) was computed for each questionnaire subscales to confirm their internal consistency reliability.

## **3. FINDINGS**

### **3.1 Demographic data**

The sociodemographic data of our sample are presented in Table 1. Age range was from 19 to 35 for female and from 19 to 29 for male students. There was no significant difference in Age between male and female participants ( $F_{(1,155)} = 0.195$ ;  $p = 0.660$ ,  $\eta p^2 = .001$ ).

### **3.2. Emotion Evaluation**

On both pleasantness and arousal ratings, only Verbal Aggression subscale showed a significant modulating effect, as principal factor or in interaction with the other factors (Gender or Picture Category). Thus, 73 students (56 females & 17 males) were assigned to the low Verbal Aggression group and 84 (67 females & 17 males) were assigned to the high Verbal Aggression group.

### 3.2.1. Picture Valence

The ANOVA carried out on pleasantness ratings of stimuli showed that male students provided significantly higher pleasantness rates compared with female students [4.20 (1.37) vs. 3.78 (1.17) respectively];  $F_{(1,153)} = 8.849$ ;  $p = 0.004$ ,  $\eta p^2 = .052$ . In addition, a main effect of Picture Category was found,  $F_{(5,765)} = 363.550$ ;  $p < 0.001$ ,  $\eta p^2 = .704$ . Subsequent pairwise comparisons ( $p < 0.05$ , Bonferroni correction) showed that pleasant stimuli (food and arousing sports) obtained the highest ratings of pleasantness [6.30 (1.38) and 6.65 (1.45) respectively], whereas mutilations showed the lowest [1.98 (1.01)]. Neutral pictures like urban scenes and neutral persons were rated as more pleasant [2.88 (1.20) and 2.74 (1.21), respectively] than mutilations, but did not differ significantly from incidents [2.73 (1.18)]. In addition, the Gender x Picture Category interaction was significant,  $F_{(5,765)} = 2.924$ ;  $p = 0.013$ ,  $\eta p^2 = .019$ . Pairwise comparisons ( $p < 0.05$ , Bonferroni correction) showed that male compared with female students rated as significantly more pleasant urban scenes, mutilations and incidents, as reported in Table 2.a, right columns. The Group x Picture Category interaction was also significant,  $F_{(5,765)} = 2.781$ ;  $p = 0.017$ ,  $\eta p^2 = .018$ . Subsequent pairwise comparisons ( $p < 0.05$ , Bonferroni correction, see Table 2.a, left columns) showed that subjects with high level of Verbal Aggression, compared with those with low level of Verbal Aggression showed significantly higher pleasantness ratings of mutilations. A similar trend was found for pleasantness ratings of incidents between high and low Verbal Aggression individuals, although the difference was near to significant ( $p=0.063$ ). All comparisons relative to the two-way interactions Gender x Picture Category and Group x Picture Category are reported in Table 2.a. No other effects or interactions reached statistical significance.

### 3.2.2. Picture Arousal

The ANOVA carried out on picture arousal evaluation showed that male students provided significantly higher arousal rates compared with female students [5.03 (1.44) vs. 4.69 (1.35),  $F_{(1,153)} = 4.065$ ;  $p = 0.046$ ,  $\eta p^2 = .026$ ]. Results also showed that subjects with low level of Verbal Aggression provided significantly higher arousal rates compared with those with high level of Verbal Aggression [4.86 (1.42) vs. 4.68 (1.35),  $F_{(1,153)} = 4.121$ ;  $p < 0.044$ ,  $\eta p^2 = .026$ ]. In addition, a main effect of Picture Category was found ( $F_{(5,765)} = 303.532$ ;  $p < 0.001$ ,  $\eta p^2 = .665$ ). Subsequent pairwise comparisons ( $p < 0.05$ , Bonferroni correction) revealed that mutilations [6.77 (1.51)] and arousing sports [6.80 (1.63)] obtained arousal ratings significantly higher than food [5.21 (1.79)] and incidents [5.45 (1.31)], whereas urban scenes [2.37 (1.11)] and neutral persons [2.00 (0.98)] were rated as less arousing than all other categories.

Gender x Picture Category interaction was also significant,  $F_{(5,765)} = 3.187$ ;  $p = 0.007$ ,  $\eta p^2 = .020$ . Pairwise comparison ( $p < 0.05$ , Bonferroni correction; Tables 2.b, right columns) showed that male compared with female students rated as significantly more arousing urban scenes and neutral persons. Table 2.b reports arousal ratings provided by males and females and by participants with low and high aggression level for each picture category. Comparisons not supported by a significant interaction were not computed.

Finally, the Group x Gender interaction was almost significant,  $F_{(1,153)} = 3.531$ ;  $p = 0.062$ ,  $\eta p^2 = .023$ , showing that only in the low Verbal Aggression group males rated pictures as more arousing compared with females. [5.36 (1.41) vs. 4.71 (1.35)], whereas comparable arousal ratings were provided by males and females [4.70 (1.38) vs. 4.68 (1.35)] in the high Verbal Aggression group. No other effects or interactions reached statistical significance.



### 3.3. Verbal Aggression and other individual traits

Means and standard deviations of students' scores on each questionnaire are reported in Table 3, for Group (high vs. low Verbal Aggression) and Gender (females vs. males). All subscales' alpha values indicated moderate to high internal consistency (from .70 for BFQ\_Energy and AQ\_Verbal Aggression to .87 for BFQ\_Emotional Stability), with the exception of IRI\_Emotional Concern, with .54. These alpha values are in line with the ones reported in previous validation studies conducted on Italian populations (Albiero *et al.*, 2006; Barbanelli *et al.*, 1997; Fossati *et al.*, 2003). Notably, Verbal Aggression is a 5-item subscale and since the number of items influences alpha values, a coefficient of .70 is remarkably elevated for such a low number of items, suggesting a high internal consistency reliability (alpha values are reported in the last-right column of Table 3).

For the whole sample, Verbal Aggression was positively correlated with AQ Anger ( $r = .561$ ;  $p < 0.001$ ), AQ Physical Aggression ( $r = .363$ ;  $p < 0.001$ ), AQ Hostility ( $r = .194$ ;  $p = 0.015$ ) and BFQ Energy scale ( $r = .293$ ;  $p < 0.001$ ), whereas it negatively correlated with BFQ Emotional Stability ( $r = -.374$ ;  $p < 0.001$ ), BFQ Agreeableness ( $r = -.241$ ;  $p = 0.002$ ) and IRI PT ( $r = -.223$ ;  $p = 0.005$ ).

In male participants, Verbal Aggression was positively correlated with AQ Anger ( $r = .695$ ;  $p < 0.001$ ), AQ Physical Aggression ( $r = .679$ ;  $p < 0.001$ ) and AQ Hostility ( $r = .373$ ;  $p = 0.030$ ), whereas it negatively correlated with BFQ Emotional Stability ( $r = -.447$ ;  $p = 0.008$ ), BFQ Conscientiousness ( $r = -.349$ ;  $p = 0.043$ ) and IRI PT ( $r = -.405$ ;  $p = 0.018$ ).

In female students, Verbal Aggression was positively correlated with AQ Anger ( $r = .523$ ;  $p < 0.001$ ), AQ Physical Aggression ( $r = .322$ ;  $p < 0.001$ ) and BFQ Energy scale ( $r = .307$ ;  $p < 0.001$ ), whereas it negatively correlated with BFQ Emotional Stability ( $r = -.355$ ;  $p < 0.001$ ), BFQ Agreeableness ( $r = -.237$ ;  $p = 0.008$ ) and IRI PT ( $r = -.184$ ;  $p = 0.042$ ). All

correlations between Verbal Aggression and other measures, for the whole sample and for male and female participants, are showed in Table 4.

#### **4. DISCUSSION**

In the present study, we explored the relationship between individual differences (i.e., aggression level, gender, personality traits) and inherent features of emotion stimuli in their effects on emotion reactions of nursing students. Our results confirmed that features of emotion pictures affect emotion reactions of nursing students much in the same way as in normal populations. Specifically, reactions to unpleasant stimuli reflect that they are perceived as highly aversive compared with neutral and positive stimuli. These results are in line with research indicating that emotional and non-emotional information differ with respect to how quickly they are detected and processed (Bradley & Lang, 2007; Lang & Bradley, 2013), the amount of attention allocated (Bradley, 2009) and the physiological reactions induced to the aim of sustaining appetitive (approach to pleasant stimuli) and aversive (avoidance of unpleasant stimuli) action-tendencies (Lang & Bradley, 2010).

Regarding the gender effects, our results confirm a general modulation of picture evaluation: male subjects showed higher pleasantness ratings in comparison with female students; nonetheless, the significant interaction between gender and picture category showed that female compared with male students rated as significantly less pleasant specific picture categories, like mutilations, incidents and urban scenes. This data is partially coherent with previous research (Bradley, Codispoti, Sabatinelli & Lang, 2001) finding that women tend to have a broad disposition to respond with greater defensive reactivity (i.e., avoidance response) to aversive pictures, regardless of their content. The different, between genders rating of urban scenes could reflect a higher attention/interest level of males compared with

females, as further demonstrated by the arousal ratings, which covary with the automatic allocation of attentional resources (Bradley, 2009; Lang & Bradley, 2013).

Our results further suggest that emotion reactions are affected not only by gender, but also by the level of verbal aggression of the perceiver, consistent with the General Aggression Model (GAM Anderson & Bushman, 2002) and in line with studies reporting significant differences related to personality dispositions and individual characteristics related to approach and avoidance (Elliot & Thrash 2002; Larsen & Augustine, 2008; MacLaren, Best & Bigney, 2010). In particular, subjects with high, compared with low level of verbal aggression, showed higher pleasantness ratings for mutilations and incidents, that is the two categories eliciting the strongest aversive reactions in normal population. For arousal ratings, verbal aggression modulates evaluations with generally lower scores obtained by the high-level aggression group. These findings are in line with research (MacLaren *et al.*, 2010) showing that low aggression levels and female gender predict a defensive tendency to orient away from threats, whereas male gender and high aggression levels are more related with a confrontational style of reaction to threatening situations.

Such findings seem to counter intuitively indicate that in the nursing context verbal aggression may play out as a 'protective' factor since it is associated with reduced levels of general arousal in response to emotional stimuli and, with decreased aversive reaction towards negative content pictures, like mutilation and incidents. Notably, these picture categories represent highly aversive situations customarily encountered in healthcare service and are intrinsically salient for the nursing profession. Notably, verbal aggression is the most typical type of aggression encountered in healthcare settings (Budin *et al.*, 2013; McLaughlin, Gorley & Moseley, 2009) which may account for the lack of significant effects on the other AQ subscales (i.e., Physical Aggression, Anger, Hostility) in the present study.

However, shy of profiling a truly 'protective' role in the nursing context Our findings, open the possibility that the dimension of Verbal AQ might have, at least partially, tapped on the tendency of being generally more assertive on part of subjects with high scores in Verbal Aggression, particularly in females. Subjects with high scores in Verbal AQ also reported higher scores in the Energy subscale of BFQ, a personality trait that highlights a distinct capacity to effectively face and manage a wide range of situations. Assertiveness is defined as an interpersonal behavior that allowing people in relationship to express their needs clearly and directly whilst maintaining boundaries (Warland, McKellar & Diaz, 2014). While widely recognized as an essential skill for healthcare professionals (Begley & Glacken, 2004; Lin, Shiah, Chang, Lai, Wang & Chou 2004) research shows that assertiveness and verbal aggression are positively correlated (Galassi & Galassi, 1975, but see also Khademi & Mehrabi, 2015 for different results). and that the line between assertive behavior and verbal aggression is often blurred (Buback, 2004). Such reading of the data is in line with research highlighting that assertiveness serves as a protective factor for nurses (Lin *et al*, 2004; Lawton & Stewart, 2005) and that it correlates positively with the ability to deal with stress and aggression in the workplace (Lounsbury *et al.*, 2003). Indeed, to function as effective, safe practitioners professional and student nurses need to be assertive without being aggressive. However, the correlational analyses carried out on individual differences showed that high level in Verbal Aggression is associated with high level in Physical Aggression, Anger and Hostility and with low level in Perspective Taking, Emotional Stability, Agreeableness and, in males, Conscientiousness highlighting its negative effects in terms of implications for patient care.

#### **4.1 Limitations**

It should be noted that, in the present study, the sample reflects the unequal distribution of genders in the nurse student population which in turn mirrors the predominantly female workforce in the nursing profession (Yi & Keogh, 2016). Future studies should examine individual differences in verbal aggression in bigger samples of nursing students with an equal distribution of female and male subjects.

Another limitation of our study could be related to the fact that we did not check for students' levels of personal distress, nor for any major life events which could have potentially influenced their emotional reactions. However, we believe our data are representative of the actual student population, which may need to manage not only healthcare practice related, but also personal distress. Nonetheless, future studies should take this into consideration when assessing emotion reactions of nurse students and nurses. They should also examine reactions to picture categories other than mutilations and incidents, to determine whether the reported effects are specific to stimulus categories that are salient to the nursing practice, or whether they reflect a more general disposition of high level aggression individuals to react in a more confrontational style to aversive stimuli (MacLaren *et al.*, 2010; Larsen & Augustine, 2008; Elliot & Thrash 2002). Finally, future studies should examine whether nurses' reactions to emotional stimuli are influenced by professional practice and seniority and whether training programs can modulate nurses' emotion reactions by improving their skills and raising awareness with positive implications for professional performance and healthcare provision. Comparison with other sample (like students of Medicine or Psychology) should also be addressed.

## 4.2 Implications of findings

A series of implications can be drawn from our findings. Considering the occupational hazards related to the nurse profession such as high exposure to stressful and adverse situations and work place aggression, it is imperative that formal education programs include specific skill building training in emotion regulation, stress management techniques and coping with adverse situations (Lin *et al.*, 2004; Warland *et al.*, 2014; Williams, 2012). Furthermore, providing a wide range of instruments and tools to nurses for on-going self-monitoring and self-evaluation is crucial to prevent and lower the incidence of burnout, aggression and patient neglect among the nurse workforce (Beech & Leather, 2006; McNamara, 2010). Staff welfare programs should be put in place aimed at enhancing healthcare and wellbeing in this professional category and should consider individual differences in personality traits, such as impulsivity and aggression, empathy and emotion regulation as potential risk and protective factors (Por *et al.*, 2011; Song *et al.*, 2018; Štiglic *et al.*, 2018). Gender should also be considered as an important factor, considering that nursing is a predominantly female workforce. This subgroup of nurse professionals should be sensitized to the impact that covert forms of expression of anger and aggression could have not only on interpersonal relations in the workplace but also on developing burnout, with implications for both their health and patient care. Educating future and current nurse professionals on how to regulate and constructively express their emotions on the workplace should be the focus of specific training programs, as should skill enhancement learning how to be assertive without being verbally aggressive.

## 5. CONCLUSION

While a great amount of research has documented the high emotional demands and aggression levels in nursing as a worldwide problem, exploring the link between emotion processing and aggression may be key to understanding how they play out in the nursing context. Negative implications of Verbal Aggression, as pointed out by its positive correlation with Physical Aggression and Anger and the negative correlation with Emotional Stability and Empathy, should be kept in mind especially as they apply to future healthcare professionals. Nonetheless, positive effects of Verbal Aggression in the nursing context could be represented by a higher capacity to cope with and a general facilitation in the approach and management of adverse situations, particularly those most arousing and strictly connected to nursing profession. Embedding emotion regulation and management education programs into undergraduate nursing curricula as well as offering specific on job training on how to manage anger, enhance assertiveness and empathy for nurse professionals should be considered as a viable strategy to countering negative effects of aggression in nursing context.

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Table 1. Sociodemographic data of participants (n=157)

	Male	Female
Gender (N)	34	123
Age [Mean (SD)]	20.79 (2.37)	20.56 (2.81)
Nationality (N)		
Italian	32	112
Non Italian	2	11
Education (N)		
General high school	28	119
Professional high school	6	4
Civil status (N)		
Single	31	117
Married	3	6

Table 2. Mean (SD) scores on picture evaluations reported for Verbal Aggression group and Gender.

Picture Category	Verbal Aggression			Gender		
	Low Level (n=73)	High Level (n=84)	<i>p</i> *	Male (n=34)	Female (n=123)	<i>p</i> *
2.a Valence Ratings	Significant Interaction			Significant Interaction		
<i>Positive</i>						
Sport	6.68 (1.53)	6.62 (1.39)	p=0.432	6.97 (1.55)	6.56 (1.42)	p=0.141
Food	6.17 (1.48)	6.36 (1.30)	p=0.228	6.20 (1.36)	6.29 (1.40)	p=0.749
<i>Neutral</i>						
Person Scenes	2.88 (1.21)	2.61 (1.20)	p=0.277	2.91 (1.12)	2.69 (1.23)	p=0.370
Urban Scene	2.92 (1.13)	2.84 (1.26)	p=0.710	3.65 (1.35)	2.67 (1.07)	p<0.001
<i>Negative</i>						
Mutilations	1.77 (0.74)	2.16 (1.18)	p=0.006	2.32 (1.36)	1.89 (0.88)	p=0.021
Incidents	2.58 (1.04)	2.85 (1.28)	p=0.063	3.16 (1.48)	2.60 (1.06)	p=0.013
2.b Arousal Ratings	Not Significant Interaction			Significant Interaction		
<i>Positive</i>						
Sport	6.88 (1.69)	6.72 (1.58)	NC	7.21 (1.53)	6.68 (1.64)	p=0.094
Food	5.13 (1.74)	5.28 (1.84)	NC	5.17 (1.82)	5.22 (1.79)	p=0.907
<i>Neutral</i>						
Person Scenes	2.11 (0.98)	1.91 (0.98)	NC	2.30 (1.14)	1.92 (0.92)	p=0.044
Urban Scenes	2.56 (1.30)	2.20 (0.89)	NC	3.17 (1.36)	2.15 (0.92)	p<0.001
<i>Negative</i>						
Mutilations	6.86 (1.46)	6.70 (1.56)	NC	6.67 (1.57)	6.80 (1.50)	p=0.907
Incidents	5.61 (1.36)	5.31 (1.27)	NC	5.68 (1.25)	5.39 (1.33)	p=0.262

Abbreviations: NC = Not Computed, as comparisons were not supported by significant interaction.

Table 3. Mean (SD) scores obtained in each questionnaire for Verbal Aggression group and Gender.

	Verbal Aggression		Gender		Cronbach Alpha
	Low Level (n=73)	High Level (n=84)	Male (n = 34)	Female (n = 123)	
<b>BFQ</b>					
Energy	2.99 (0.45)	3.22 (0.49)	3.13 (0.56)	3.11 (0.46)	.70
Agreeableness	3.65 (0.48)	3.51 (0.53)	3.52 (0.51)	3.59 (0.51)	.76
Conscientiousness	3.56 (0.52)	3.55 (0.58)	3.56 (0.61)	3.56 (0.53)	.75
Emotional Stability	2.88 (0.72)	2.50 (0.66)	3.09 (0.76)	2.57 (0.66)	.87
Openness	3.56 (0.52)	3.67 (0.49)	3.65 (0.52)	3.60 (0.50)	.74
<b>AQ</b>					
Physical Aggression	13.82 (4.97)	17.17 (7.85)	20.18 (8.61)	14.35 (5.71)	.87
Verbal Aggression	10.96 (2.07)	16.76 (2.49)	13.65 (3.50)	14.18 (3.76)	.70
Anger	14.45 (4.02)	18.48 (5.59)	15.65 (5.83)	16.87 (5.15)	.78
Hostility	21.12 (5.91)	22.40 (6.42)	19.91 (6.46)	22.33 (6.05)	.78
<b>IRI</b>					
Perspective Taking	19.25 (4.67)	18.07 (4.29)	18.20 (4.33)	18.73 (4.55)	.75
Fantasy Scale	17.94 (4.91)	17.51 (4.79)	14.91 (4.99)	18.49 (4.55)	.74
Emotional Concern	19.15 (3.72)	18.33 (3.58)	16.97 (4.27)	19.19 (3.33)	.53
Personal Distress	10.89 (4.77)	11.57 (4.56)	9.44 (4.79)	11.76 (4.51)	.74

Abbreviations: BFQ= Big Five Questionnaire; AQ = Aggression Questionnaire; IRI = Interpersonal Reactivity Index.

Table 4. Pearson's correlation coefficients among Verbal Aggression (VA) and other scales.

	Verbal Aggression		
	Total sample (n=157)	Male (n=34)	Female (n=123)
<b>BFQ</b>			
Energy	.293**	.264	.307**
Conscientiousness	-.090	-.349**	-.017
Emotional Stability	-.374**	-.447**	-.355**
Agreeableness	-.241**	-.278	-.237**
Openness	.084	-.031	.118
<b>AQ</b>			
Physical Aggression	.363**	.679**	.322**
Anger	.561**	.695**	.523**
Hostility	.194*	.373**	.138
<b>IRI</b>			
Perspective Taking	-.223**	-.405**	-.184*
Fantasy Scale	-.060	.186	-.157
Emotional Concern	-.087	-.031	-.130
Personal Distress	.060	.058	.047

Abbreviations: BFQ= Big Five Questionnaire; AQ = Aggression Questionnaire; IRI = Interpersonal Reactivity Index; VA = Verbal Aggression.

\*\* Correlation is significant at the 0.01 level (2-tailed).

\* Correlation is significant at the 0.05 level (2-tailed).