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Gender bias favors female nursing students in the written examination evaluation: Crossover study

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ABSTRACT

Background: Gender discrimination against male nursing students has been reported and attributed to the female-dominated tradition of nursing profession.
Objectives: To investigate gender bias in the written examination evaluation of undergraduate nursing students.
Design: One-group crossover study with two phases.
Setting and Participants: Four male and four female examiners provided 400 previously graded examination scripts (50 each) of nursing students.
Methods: Participating examiners were asked to re-grade scripts after any information about student identity was covered to allow blind marking. Script degrees after non-blind and blind marking were compared within male and within female students, as well as between male and female students.
Results: Significantly more female students' degrees shifted downwards and less of them shifted upwards compared with male students' degrees after blind marking, while mean degree of female students was significantly lower. Among male examiners, significantly more female students' degrees shifted downwards and less of them shifted upwards compared with male students' degrees after blind marking, while mean degree of male students was significantly higher. Among female examiners, mean degree of both male and female students was significantly lower after blind marking. No central tendency bias was detected.
Conclusions: Gender bias in favor of females was detected in the written examination evaluation of nursing students. This unequal treatment may prevent retention of males in nursing studies and profession.

1. Introduction

Gender discrimination or bias has been defined as "any distinction, exclusion or restriction made on the basis of socially constructed gender roles and norms, which prevents a person from enjoying full human rights" (World Health Organization, 2001). Gender bias is neither intentional nor conscious; instead, human behavior is generally shaped by unintended biases, which stem from repeated exposure to pervasive cultural stereotypes (Moss-Racusin et al., 2012). It is exactly this non-conscious nature of bias that renders its identification difficult.

According to Nieva and Gutek (1980), the pattern and degree of gender bias depends on three factors. First, sex role incongruency refers to tasks deemed to be more appropriate for a particular gender. Thus, traditionally masculine and feminine tasks are commonly associated with bias favoring males and females respectively. Second, level of inference refers to the degree of ambiguity of the evaluation criteria; the higher this degree, the more likely the introduction of bias. Third, level of performance refers to qualification or performance involved. When both genders are highly qualified or perform successfully, males tend to be evaluated more favorably than females, and the opposite in case of low qualifications or poor performance.

2. Background

Unequal student treatment according to their gender has been identified among the most common discrimination types in education, which means that either male or female students are expected to be unfairly disadvantaged (Berekashvili, 2012; Bradley, 1984). Observed gender differences in students' performance have primarily been attributed to gender bias of teaching personnel, rather than to inherent differences between males and females (Halpern et al., 2007). With regard to teaching personnel's gender, this may favor gender bias, although both males and females are exposed to the same expectations and stereotypes about gender-related appropriate behavior (Bradley, 1984).

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Gender bias in favor of males has been reported in most education degrees (Eagly and Mladinic, 1994; Moss-Racusin et al., 2012; Riegle-Crumb and Humphries, 2012). In tertiary education, teaching personnel continue to express bias against female undergraduate students, despite decreases in sexism among highly educated people during the last decades (Moss-Racusin et al., 2012). However, as has been reported, bias against females may either be limited to institutions where the vast majority of teaching personnel are male (Dennis and Newstead, 1994), or might have even evolved in favor of females in particular science fields (Breda and Ly, 2014).

Nursing has traditionally been a female-dominated profession related with feminine ways of caring (McLaughlin et al., 2010), with about 90% of US and UK nurses being women (Health Resources and Services Administration, 2010; Kouta and Kaite, 2011). In nursing, gender bias in favor of females can be found in the language used and in nurses' image perpetuated within clinical practice areas (Dyck et al., 2009; Keogh and O'Lynn, 2007). Due to patriarchal beliefs that nursing role is appropriate only for females, male nurses are often questioned about their masculinity by peers and patients and therefore feel the need to justify their career choice (Kelly et al., 1996; Meadus and Twomey, 2011). Moreover, male nurses are commonly preferred for moving or lifting patients and for controlling violent situations (Kelly et al., 1996), while their caring actions can be easily misinterpreted by female patients (Harding et al., 2008). It is, however, worth-noticing that males can be disproportionately promoted and over-represented within leadership positions of the nursing profession. There is recent evidence that male nurses are twice as likely to hold management positions in the UK top hospitals as their female counterparts (Santry et al., 2010).

According to reports, gender bias and sexism against males is common in nursing education (Cudé and Winfrey, 2007; Kermode, 2006). Unique learning needs and differing communication styles of male students are generally not taken into consideration, while teaching personnel express higher expectations from male students and manifest non-supportive behavior toward them (Anthony, 2004). In addition, feelings of inferiority, oppression, loneliness and isolation from the academic or clinical setting are more commonly reported by males, along with the absence of motivation and interest for their studies (Crigger et al., 2007; Stott, 2007; Wang et al., 2011). As a consequence, male nursing students view nursing as more appropriate for females and are less likely to complete their studies or to pursue nursing profession after their graduation (Li et al., 2009; McLaughlin et al., 2010).

The occurrence of gender bias in students' written examination evaluation has been scarcely studied (Bradley, 1984). To prevent bias associated with written examination, the use of blind, or anonymous, marking has been suggested (Newstead and Dennis, 1990). In blind marking, students' identity is kept unknown to the examiner at the time of marking since examination scripts are numbered and not named. Student evaluation is therefore supposed to be much more objective, considering that the examiner cannot be affected by factors such as student gender or ethnicity. Unfortunately, evidence on gender bias occurring in the examination evaluation of nursing students, or on the use of blind marking for preventing this bias, is completely missing from literature.

Besides the possibility that either males or females are favored, gender bias has been reported to occur as two-way bias (Bradley, 1984; Deaux and Traynor, 1973). Central tendency bias refers to the phenomenon that males are rated more favorably than females at high levels of competence but, at low levels, it is females who are rated more favorably. In the case of written examination, central tendency bias entails that the variance of marks will be higher for males, considering that these will be marked more extremely than females (Newstead and Dennis, 1990). The use of blind marking would thus be expected to equalize mark variance between genders, by shifting the marks of females toward extremes and those of males toward centre of the mark distribution (Bradley, 1993).

The aim of this study was to investigate the occurrence of gender bias in the written examination evaluation of undergraduate nursing students. Both one-way bias (whether males or females were favored) and two-way bias (whether males or females were favored at specific performance levels) were explored, along with the effect of the examiner's gender.

3. Methods

3.1. Design, Participants and Study Conduction

This study was conducted in the Nursing Department of the Technological Educational Institute of Southwestern Greece. One-group crossover design with two phases was used. Eight members of the academic teaching personnel (examiners), four males and four females, were invited to participate, and all of them accepted the invitation. Examiners' selection was based on the equal representation of both genders among nursing and non-nursing teaching personnel employed in our Department; thus, four examiners were nurses (two males and two females), three were physicians (two males and one female) and one was mathematician (female). Each of the examiners had been assigned to teach one or more theoretical courses during the previous academic year (2014–2015) and grade the examination scripts of students who participated in the examination of these courses (in our Institute, only one examiner grades all students' scripts of a particular course). All examiners had PhD degree and teaching experience longer than 5 years in tertiary education.

Crossover design constitutes a repeated measurements design, in which a group receives different treatment during different time periods; in this study, selected student scripts were sequentially evaluated by the use of non-blind and blind marking to serve as their own controls. At the first phase, each examiner was asked to select the scripts of 50 undergraduate students who had participated in the September 2015 examination period (1st to 18th of September). All scripts provided by each examiner came from the same course. To achieve equal representation of both genders, 25 scripts of male students and 25 of female ones were asked to be selected by each examiner or, otherwise, the whole number of male students' scripts in case these were <25 in the particular course. Besides gender, script selection was random and selected scripts were received by the investigators. Each script had been graded on a 10-point scale (with one decimal point), from 0 to 10.0 (excellent), with degrees <5.0 indicating that the student had failed.

At the second phase, all selected scripts (400 in total) were edited by the investigators to allow blind marking, and each examiner was then asked to re-evaluate and re-grade his/her 50 selected scripts. Every information about student identity (surname, name, record number), as well as any grade marks made by the examiner on the script, were appropriately covered and numbers were added to allow identification of student identity only by the investigators (initial degrees per student were saved on a separate list). Edited scripts were then returned to the respective examiner and, after they were re-graded, they were again received by the investigators. After all scripts were collected, the degrees of non-blind (regular) marking were matched per student with those of blind marking.

Examiners' exposure to the first (non-blind) script evaluation could be followed by bias in grading during blind script re-evaluation (carryover effect), in case the examiners remembered letter or writing style and thus suspected students' identity (Burns and Grove, 2006). To minimize risk for carryover effect, the second phase was not conducted immediately after the first one (18th to 24th of September), but after a washout period of two months (24th to 30th of November). Likewise, to minimize risk for Hawthorne effect (modification of participants' behavior due to their awareness of study aims), the examiners were not informed about the true study aim until blind marking was completed and scripts were returned to the investigators.