INVESTIGATING INDIVIDUAL AND SITUATIONAL FACTORS INFLUENCING ACADEMIC INTEGRITY: AN EMPIRICAL STUDY AMONG MEDICAL STUDENTS

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Abstract

The study investigated the impact of individual, cultural & contextual factors on academic integrity, conceptualized in terms of passive and active cheating, among medical students in Jordan. Using data collected from 353 students, it was determined through odds ratio analysis that cultural collectivism and academic integrity culture had no impact on either active or passive cheating. However, traits of both high conscientiousness and high agreeableness substantially reduced one’s risk of active cheating. Neither the cultural and personality variables, nor gender were found to increase one’s risk of passive cheating. These findings contradict current beliefs that collectivism impacts cheating among Middle East students. Various managerial and theoretical implications are discussed.

Key words: academic integrity, cheating, collectivism, personality traits, medical students

INTRODUCTION

Academic dishonesty is a universal dilemma. Today, many faculty who have been in higher education have their own personal story about some type of student academic misconduct. While Bandura (1986, p.527 in his modeling and social learning theories postulated “much of human behavior is learned through the influence of example”, and medical schools have long used this precept in their ‘see one, do one, teach one’ mantra, the concern regarding cheating and ethics still persists (Kilminister et al 2017; Teixeira 2013; GMC 2015). So what if one could determine the risk for cheating in medical students the same way one determines the risk of cancer or diabetes based on certain genetic or behavioral factors?

Previous research has focused on a number of individual, situational and cultural factors having an impact on academic integrity. However, exploring causes of academic misconduct in higher education “has largely overlooked the values of integrating individual and situational perspectives to structure empirical examinations” (Ogilvie & Stewart 2010 p130). Currently the literature on academic integrity (AI) mostly focuses on either the individual variables (e.g. personality variables, as chosen in this study) or contextual variables (e.g. cultural variables, as chosen in this study). Traditionally, studies exploring the causes of poor AI focus more on individual student characteristics and lesser on the cultural context of the educational environment. Both the broad categories i.e. individual and contextual are important. For example, on the individual level, academic dishonesty can compromise learning while on the school level, academic dishonesty threatens the “equity and efficacy of educational assessment and harms the reputation of educational institutions” (Ogilvie and Stewart 2010, p. 131).

This lack of learning may manifest itself through poor job performance and cause harm in various ways. It may also lead to enhanced corruption and harm to society. Research has established a correlation between AI and unethical work practices (Ma 2013) as well as with the country’s corruption index (Teixeira 2013). Further, there is a need to understand the personal and contextual factors affecting cheating behavior to “help transform a culture of cheating into a culture of learning” (Cronan Mullins & Douglas 2018, p. 198).
Therefore, the aim of this research was to develop a better understanding of individual, cultural and contextual differences and their impact on academic ethical behavior, among medical students using the lens of modeling and social learning theories (Bandura 1986). It is important to address this gap and attempt at developing a model incorporating both individual, and cultural and contextual factors because although they are linked, they are not mutually exclusive. To this end, they study adopts the methodology of determining risk values for a certain behavior, much as the measures of effect give physicians the ability to “summarize the strength of the link between exposures and outcomes” (Tripepi et al 2007, p789).

Academic Dishonesty vs. Academic Integrity

Despite a continued concern for ethical behavior and integrity, cheating remains a problem in the collegiate setting on a global level (Khalid 2015). Academic dishonesty generally includes cheating on examinations, collaborating on individual assignments, plagiarizing work or ideas, copying other students, fabricating work and even buying papers and reports, that one could divide into subgroups of active when doing the cheating themselves or passive when being aware of others who are doing it, but not taking any action to stop it (Eisenberg 2004).

The evidence “suggests that such behavior is on the rise resulting in universities experiencing an integrity recession” (van Zyl & Thomas 2015, p.3), with little regard for the component core values of honesty, trust, fairness, respect, responsibility, and courage (Rhoolter 2013). Honor codes and councils are essential, as is the support by faculty thereby creating an academic integrity culture, for ‘higher education worldwide… is only sustainable in the longer term if there are good standards of conduct among academic practitioners’ (Macfarlane et al 2014, p.223).

Medical students are not immune to cheating, as various studies (Baldwin et al 1996; Taradi et al, 2010; General Medical Council 2015; Henning et al 2015, Ahmed & Sheikh, 2016) over the past three decades have shown. The first major attempt to document and understand student dishonesty was by Bowers (1964), but by the 1990s there were several large studies conducted (McCabe & Trevino, 1993 & Payne & Nantz 1994) being closely followed in 1996 by a study focusing solely on medical students that surveyed 31 out of the then 40 US medical schools (Baldwin et al1996). The results from the latter study showed that more than a third of medical students had personally witnessed cheating and more than two-thirds had heard of cheating by others providing a clear indication of reported passive cheating in US medical schools. More recently, a study of medical students in Croatia found that 99% come prepared to actively cheat (Taradi et al 2010), while in Pakistan 55% report having cheated at least one time (Ahmed & Sheikh 2016). Similarly, Henning et al (2015) found that 39% surveyed reported engaging in manipulation of data, such as fabricated histories in New Zealand. As a result, students who cheat do not develop the knowledge or skills they need (Gallant et al 2015). This has life-threatening implications for patients seeking medical care, besides the obvious concern for ethical decision making among future doctors.

As medical education has globalized, questions have arisen, predominately in Asian/ Arab countries, as to whether what appears as a lack of academic integrity could be based on factors of a cultural context and personality, and if these differences impact on active or passive cheating or both.

Active and Passive cheating

While students are generally well aware of the unethical aspects of active cheating, they tend to hold more nuanced attitudes in identifying situations of passive academic dishonesty, as the motives are more self-less and part of a collective culture. Hetherington and Feldman (1964) were the first to differentiate the concepts of active and passive cheating. Passive cheating occurs when the individual plays a passive role in the cheating situation by helping or ignoring an active cheater. Eisenberg (2004) thus defined it as the willing cooperation of students permitting other students to copy materials from their exams. Students try to justify this behavior as help extended to a friend and do not perceive their acts as cheating.

Hetherington and Feldman (1964, p.213) as “social cheating which involves two or more people but in which the individual plays a passive role”. Passive cheating remained a largely unexplored construct until Eisenberg (2004, p. 6) discussed the construct of passive cheating as form of cheating “in which a
student is not obtaining the information him/herself but passively cooperates with another student by letting him/her copy materials from his/her exam”. Similarly, Anitsal et al. (2009, p. 19) who added to this by saying “Passive academic dishonesty behaviors include activities such as noticing someone else cheating and not reporting it”. After that, again this concept remained relatively unexplored. Thus there have been a few attempts to differentiate between types of cheating, passive cheating but it is still a relatively uncharted concept in the academic integrity literature, and this was the first such study addressing these differences between active and passive cheating in the Middle East.

Cultural values

It has been suggested that cultural values such as collectivism play a role on student values that in turn impact academic integrity (Imran & Nordin 2013). People in collectivist cultures tend to define themselves as parts of groups, giving priority to in-group goals. They define most relationships with in-group members as communal with an emphasis on social expectations (Mayo, et al, 2015). In collective societies it is culturally expected that you will help someone if you are asked (Gallant et al, 2015), a situation which could directly be relevant if transferred to the academic assessment situation.

Hofstede studies on cultural dimensions are continually cited, and despite reservations on his methodology, he is often referred to as a pioneer in the field of cross-cultural studies (Buda & Elsayed-Elkhouly 1998; Gupta et al 2002; Whiteoak et al 2006; Obeidat et al 2012). Individualism-Collectivism is one of the five cultural components that are part of the cultural dimension matrix (Yoo, Donthu, & Lenartowicz 2011), and appears to be the most significant cultural difference (Triandis 1996). This was supported by Greenfield (2000) who emphasized it as the ‘deep structure’ of cultural differences. In Arab society, people from birth are integrated into strong, cohesive tribes, which result in a lifetime of protection in exchange for unquestionable loyalty (McCabe, Feghali & Abdullah 2008). Jordan was identified as ‘Arab’ having one cultural characteristic by Hofstede (1994), and scored relatively low on the individualistic-collective-component, with a score of 30 (Hofstede, 2018). The collective average Arab country score from Hofstede’s classification, was 38 out of a possible score of 100 (Obeidat et al, 2012), supporting the communal concepts and the importance of the group, with loyalty being the driving force.

Recent studies on academic integrity have begun to identify cultural values as part of the issue (van Zyl & Thomas 2015). In the UAE, 71% of Middle Eastern respondents admitted to academic misconduct because they did not perceive these behaviors as serious (Williams et al 2014). While O’Sullivan (2014) reported that family pressure to make good grades was a driving factor in academic dishonesty among Gulf students. Similarly, Henning et al. (2015) showed significant differences between Asian and European students with respect to disclosure in the areas of copying and collusion.

Consequently, collectivism was used as the variable for this research to understand the differences in behavior based on culture. However, it should not be assumed that everybody in individualist cultures has all the characteristics of these cultures, and that everyone in collectivist cultures has the characteristics of those cultures (Triandis, 1996). For that reason, collectivism was measured at an individual level.

DEVELOPMENT OF HYPOTHESES: FACTORS IMPACTING PROPENSITY FOR ACTIVE AND PASSIVE CHEATING

Gender and cheating behavior

Gender differences in education are well established with male and female students displaying different behaviors, attitudes and work habits in the academic setting (Parahoo, Harvey & Tamim 2013). Honig and Bedi (2012) used sex-role socialization theory to argue that women were socialized to obey rules, hence being less likely to engage in dishonest behaviors (Chapman & Lupton 2004; McCabe & Trevino 1997; Simon et al. 2004; Whitley, Nelson, & Jones 1999). Conversely, since risk taking is viewed as a masculine trait enhancing the male self-esteem through peer appreciation, male students were more likely to cheat (Wilson & Daly, 1985). However, studies on the effect of gender on cheating behavior have reported inconsistent findings, while the gender effect on cheating is abating, particularly among
millennial students whose learning experience expectations were found to be similar (Harvey, Parahoo & Santally 2017). This leads to the first two hypotheses:

H1: Gender is a risk factor for (a) active or (b) passive cheating among medical students.

**Academic Integrity culture and cheating behavior**

Students’ interpretation of what constitutes academic dishonesty influences their intentions to cheat and if students fail to recognize actions leading to academic dishonesty, the likelihood of actual cheating behavior increases (Anitsal et al. 2009). Furthermore, the probability of engaging in cheating was significantly higher in conditions where the possibility of detection was low when compared to situations where the possibility of detection was high (Nagin & Pogarsky 2003). This was supported by O’Sullivan (2014) who in a small sample from the UAE found more than 90% admitted to some form of academic dishonesty, if they thought there were few consequences, even if they were caught, but ‘academic dishonesty was lower when respondents perceived that their peers disapproved of such misconduct’ (McCabe & Trevino 1997, p.391). In essence, these findings suggest that academic integrity culture instilled in an institution will impact the attitudes and behaviors towards cheating behavior. This leads to the second set of hypotheses:

H2: The Academic Integrity Culture in the institutions decreases one’s risk of (a) active or (b) passive cheating among medical students.

**Personality factors and cheating behavior**

Personality and other individual differences also impact academic dishonesty behavior. One well-established personality construct that is used widely in research is the Big Five model (Goldberg 1981). The dimensions of the big five look at extroversion, openness to experience, emotional stability, conscientiousness and agreeableness. Byle and Holtgraves (2008) tested the link between the big five personality constructs and integrity test scores. Their results demonstrated that conscientiousness, agreeableness, and emotional stability were significantly correlated with honest scores on the test, and there was a significant negative correlation between conscientiousness and magnitude of faking. Giluk and Postlethwaite’s meta-analysis (2015) found that conscientiousness and agreeableness were the strongest predictors, as did Karim, Zamzuri and Nor (2009) who demonstrated that agreeableness, conscientiousness and emotional stability were significantly correlated, negatively, with unethical internet behavior by university students. Therefore, three of the big five dimensions: conscientiousness, agreeableness and emotional stability were identified as pertinent variables for the purpose of this study, and the following set of hypotheses are proposed.

H3: Personality traits of (a) emotional stability, (b) agreeableness & (c) conscientiousness are risk factors for active cheating among medical students.

H4: Personality traits of (a) emotional stability, (b) agreeableness & (c) conscientiousness are risk factors for passive cheating among medical students.

**Collectivism and Academic integrity**

Finally, it is proposed to quantitatively verify the dynamics of academically dishonesty actions by examining Hofstede’s cultural variable for collectivism as potential risk factor related to passive cheating among medical students. As discussed in the preceding section, the national cultural trait of collectivism influences student values that in turn impact academic integrity (Imran & Nordin 2013), with people in collectivist cultures giving emphasis to social expectations (Mayo et al. 2015), and helping someone if they are asked (Gallant et al. 2015). Thus, the following hypothesis is proposed.

H5: Collectivism is a risk factor for passive cheating among medical students.
MATERIAL & METHODS
To develop insights into the issue of academic dishonesty, in-depth interviews with four faculty members, a university registrar, and two members of a students’ disciplinary committee were conducted. This process helped in conceptualizing and identifying measures for the seven study constructs. As seen in Table 1, existing validated measures from literature were used as source of questionnaire items, which were then fine-tuned to suit the context of the present study. It was recognized that measuring active cheating through self-reporting could represent a sensitive issue for many respondents. To overcome this problem and collect reliable responses while reducing the threat associated with an honest response, the items were crafted in terms of intentions to cheat, as there is a strong correlation between intentions and actual behavior (Ajzen 1985). A pilot study was conducted with a sample of 9 students resulting in minor item refinement, leading to the final study questionnaire (details in Table 1).

<table>
<thead>
<tr>
<th>Construct &amp; Sources</th>
<th>Number of Items</th>
<th>Item Description</th>
</tr>
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</table>
| Academic Integrity Culture Kisamore et al. 2007 | 5 | • My university has clearly written policies for academic integrity  
• The academic integrity policies are emphasized upon to the students at my university  
• Students caught cheating are penalized fairly and non-discriminately at my university  
• Faculty at my school show genuine concern for academic integrity  
• My university has a good climate for academic integrity |
| Collectivism Yoo et al. 2011 | 6 | • Individuals should sacrifice self-interest for the group  
• Individuals should stick with the group even through difficulties  
• Group welfare is more important than individual rewards  
• Group success is more important than individual success  
• Individuals should only pursue their goals after considering the welfare of the group  
• Group loyalty should be encouraged even if individual goals suffer |
| Emotional Stability DeYoung, et al. 2007 | 4 | • I am a person whose moods are stable.  
• I keep my emotions under control.  
• I do not worry about things.  
• I do not become overwhelmed by events |
| Agreeableness DeYoung et al. 2007 | 4 | • I feel other people’s emotions.  
• I like to do things for others.  
• I avoid imposing my will on others.  
• I seek to avoid conflict. |
| Conscientiousness DeYoung et al. 2007 | 4 | • I get things done quickly  
• I always know what I am doing.  
• I do not like disorder.  
• I see to it that rules are observed. |
Active Cheating
McCabe & Trevino 1993; Anistal et al. 2009

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<td>5</td>
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<tr>
<td></td>
<td></td>
<td>• I would use smart phone or other electronic devices to cheat in an exam, if I intended to cheat.</td>
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<td></td>
<td></td>
<td>• I would copy material and turn it in as my work, if I intended to cheat.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• I would outsource someone to write my assignment and submit it as my work, if I intended to cheat.</td>
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<tr>
<td></td>
<td></td>
<td>• I would bring cheat sheets to the exam to copy, if I intended to cheat.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• I would copy from another student during an exam, if I intended to cheat.</td>
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Passive Cheating

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<td></td>
<td>4</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>• I would let my friend copy from me during tests and exams</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• I would let my friend copy my assignment and present it as his/her own work</td>
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<tr>
<td></td>
<td></td>
<td>• I would help my friend in completing his/her take home individual assessment</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• When I notice cheating by others, I would not inform the university</td>
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</table>

Survey Administration

After receiving IRB approval, the survey was then administered to students enrolled at one of the major universities in Jordan. To reach students both on and off campus as well as in clinical rotations, the university website was used as the platform to inform students about the survey. Students when logging on to the university website were provided with an announcement informing them about the survey being conducted, how confidentiality would be maintained (including none of their direct data or identities being available to the university administration) and provided a web link on Survey Monkey if they were interested in participating. It was important for students to understand that their individual survey results would not be monitored through the university website or student logins. Students who then chose to participate remotely accessed the survey via the Survey Monkey website, and were provided an informed consent form before beginning the survey.

The online survey was part of a larger study that investigated academic integrity at the university, conducted over a six-week period. Medical students comprised 353 of the surveys giving a 32% response rate among the medical students then enrolled. While online response rates are typically lower (Saleh & Bista 2017), the response rate was in line with average response rates achieved for online surveys (Nulty 2008) and fell in line with reported online response rates of physicians (Cunningham et al. 2015). All the medical students at the university were of Arab origin, with the majority being Jordanian (85%), while approximately 15% came from other Arab countries. Forty-six percent were males and 54% were females, being broadly similar to the gender distribution among the medical school population. Confirmatory factor analyses were conducted on the constructs for both active and then passive cheating, along with reliability and validity for each of the variables.

Data Analysis

The data was analysed in a multi-stage process. The measurement models of the study variables (emotional stability, agreeableness, conscientiousness, academic integrity culture, collectivism, active cheating and passive cheating,) were collectively tested through Confirmatory Factor Analysis (CFA) in LISREL to assess uni-dimensionality of the different scales. Since the objective was to assess the effect of different individual, contextual and cultural variables on (1) active cheating and (2) passive cheating, CFA was first conducted among the six personality and cultural variables for active cheating, and then the same process was repeated with passive cheating. The statistics derived from the CFA allowed assessment of composite reliability (CR) to determine the internal consistency of the various scales, as well as different forms of validity using Average Variance Extracted (AVE) (Hair et al. 2010).
A logistic regression analysis was adopted to determine if a construct had an effect on the presence or absence of either active or passive cheating. As such an odds ratio was calculated (Bartlett 2015) for each of the individual, contextual & cultural variables related to passive and then to active cheating, as well as for gender differences. The use of an odds ratio is commonly used in medicine/epidemiology (VanderWeele 2017), as it allows one a quick and easy way to understand the impact of binary outcomes (i.e. disease/not disease, positive/negative, presence/absence). “One reason for the popularity of the OR is that it is directly estimated by the logistic regression” (Martinez, et al. 2017, p193), allowing one to measure the association. In this regard, each study variable was converted into dichotomous groups by partitioning the data as being below or above the mean score of the variable being divided into high and low since these could be determined as positive or negative (Ferguson & Lievens 2017). Then cross tabulation was used to construct a 2x2 matrix with each one of the independent variables and either active or passive cheating as the dependent variable.

The odds ratio was defined as per Szumilas (2010) and CDC (2012) guidelines using:

\[
OR=\frac{ad}{bc}
\]

95% confidence intervals (95% CI) were then calculated as follows (Szumilas 2010):

Upper 95% CI = \( e^{\beta} \left[ \ln(OR) + 1.96 \sqrt{\frac{1}{a+b+c+d}} \right] \)

Lower 95% CI = \( e^{\beta} \left[ \ln(OR) - 1.96 \sqrt{\frac{1}{a+b+c+d}} \right] \)

Using a likelihood ratio tests provided p-values. For determining the significant level for the value of \( \beta \) or the OR, testing the hypothesis, with the significant level for the test determined as \( P(N(0,1) \geq Z) \), where the null hypothesis could be stated as Ho: OR=1.

**CFA for model of Active Cheating**

The fit indices showed a good fit to the model (Hair et al, 2010) with normed chi-squared=581.65/215 degrees of freedom (df)=2.70; RMSEA=0.07; CFI=0.97; IFI=0.97; SRMR=0.06), thereby confirming that the scales were uni-dimensional.

### Table 2. Statistics pertaining to reliability and validity for active cheating behavior

<table>
<thead>
<tr>
<th>SN</th>
<th>Construct</th>
<th>CR</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
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<tbody>
<tr>
<td>1</td>
<td>Academic Integrity Culture</td>
<td>0.86</td>
<td><strong>0.61</strong></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>2</td>
<td>Collectivism</td>
<td>0.88</td>
<td>0.28</td>
<td><strong>0.61</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Emotional Stability</td>
<td>0.79</td>
<td>0.6</td>
<td>0.24</td>
<td><strong>0.57</strong></td>
<td></td>
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</tr>
<tr>
<td>4</td>
<td>Agreeableness</td>
<td>0.80</td>
<td>0.20</td>
<td>0.50</td>
<td>0.35</td>
<td><strong>0.57</strong></td>
<td></td>
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<tr>
<td>5</td>
<td>Conscientiousness</td>
<td>0.77</td>
<td>0.40</td>
<td>0.34</td>
<td>0.59</td>
<td>0.67</td>
<td><strong>0.52</strong></td>
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<tr>
<td>6</td>
<td>Active Cheating</td>
<td>0.93</td>
<td>0.05</td>
<td>0.00</td>
<td>0.02</td>
<td>0.01</td>
<td>0.01</td>
<td><strong>0.73</strong></td>
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</table>

(CR=Composite Reliability; AVE values on diagonal, squared correlations between constructs below diagonal)

**Reliability and Validity for Active Cheating model**

We adopted the concept of composite reliability (CR) also referred to as construct reliability by Fornell and Larcker (q 10, p45). As illustrated in Table 2, the CR of each of the six scales was good (>0.70 as recommended by Hair et al. 2010). Face validity was established by using validated measures sourced from literature (see Table 1). Convergent validity was established using the criteria of Hair et al (2010) by examining the path loadings, which were all high. Further, the average variance extracted (AVE, proposed by Fornell & Larcker, 1981) exceeded 0.5 for all constructs thereby confirming convergent validities. Discriminant validities between a pair of latent variables was established by comparing the two respective AVE values to the correlation estimates between the same two variables. As shown in Table 2, except for the variable conscientiousness-agreeableness, and conscientiousness-emotional
stability the AVE values all exceeded the correlation estimates thereby establishing discriminant validities. A complementary assessment for discriminant validity was undertaken as per Anderson and Gerbing (1988), for emotional stability, agreeableness and conscientiousness. A confidence interval (±two standard errors) was constructed around the correlation estimate between the two variables, to confirm that it did not include unity, with confidence intervals of 0.76-0.88 and 0.69-0.85 for the correlations of constructs respectively, thereby supporting discriminant validity. Further, since the literature conceptualized these three variables as distinct constructs, it made theoretical sense to retain them as separate variables.

CFA for model of Passive Cheating model

With passive cheating the fit indices also showed a good fit to the model as well (Hair et al, 2010) with normed chi-squared=504.1/174 df=2.90; RMSEA=0.07; CFI=0.96; IFI=0.96; SRMR=0.08), confirming that the scales were uni-dimensional.

<table>
<thead>
<tr>
<th>SN</th>
<th>Construct</th>
<th>CR</th>
<th>1</th>
<th>2</th>
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<tbody>
<tr>
<td>1</td>
<td>Academic Integrity Culture</td>
<td>0.86</td>
<td>0.61</td>
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<tr>
<td>2</td>
<td>Collectivism</td>
<td>0.91</td>
<td>0.30</td>
<td>0.61</td>
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<tr>
<td>3</td>
<td>Emotional Stability</td>
<td>0.80</td>
<td>0.27</td>
<td>0.26</td>
<td>0.58</td>
<td></td>
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</tr>
<tr>
<td>4</td>
<td>Agreeableness</td>
<td>0.79</td>
<td>0.20</td>
<td>0.49</td>
<td>0.34</td>
<td>0.55</td>
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<tr>
<td>5</td>
<td>Conscientiousness</td>
<td>0.76</td>
<td>0.40</td>
<td>0.34</td>
<td>0.58</td>
<td>0.69</td>
<td>0.51</td>
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<tr>
<td>6</td>
<td>Passive Cheating</td>
<td>0.72</td>
<td>0.04</td>
<td>0.08</td>
<td>0.09</td>
<td>0.05</td>
<td>0.04</td>
<td>0.48</td>
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</table>

(CR=Composite Reliability; AVE values on diagonal, squared correlations between constructs below diagonal)

Reliability and Validity for Passive Cheating model

As illustrated in Table 3, the composite reliability (CR) of each of the six scales was good (>0.70 as recommended by Hair et al. 2010). Face validity and convergent validity were established using the same criteria (Hair et al. 2010). Again as with the active cheating results, the AVE exceeded 0.5 for all constructs, a relative exception being passive cheating with a marginal value of 0.48, which was sufficiently close to the cut-off and was thus retained (see Table 3). This confirmed convergent validities. For discriminant validities (See Table 3) the AVE values all exceeded the correlation estimates, except for the two correlations: conscientiousness-agreeableness and conscientiousness-emotional stability. For these two correlations, a similar complementary assessment was undertaken as conducted for active cheating. The findings showed a confidence interval of 0.77-0.89 and 0.68-0.84 for conscientiousness-agreeableness and conscientiousness-emotional stability respectively, thereby supporting discriminant validity between these constructs. Having established reliability and validity of each study scale, it was possible to proceed to test the study hypotheses via the odds ratio.

As previously described, mean values were determined for active and passive cheating, \( \bar{x} = 1.86 \) and \( \bar{x} = 2.92 \), respectively. Based on these means dichotomous groups (above and below mean values), were established for passive and active cheating and the odds ratios were then determined for each of the potential risk factors (see Table 4 and Table 5) to measure the strength (if any) they had on cheating.
RESULTS

Passive Cheating

The results showed that those who were more likely to passively cheat had a higher emotional stability score (OR = 1.78, 95% CI of 1.16-2.72, see Table 4), indicating that medical students who were emotionally stable were more likely to be party to passive cheating. However, collectivism, academic integrity culture, gender, agreeableness, and conscientiousness did not have any measurable impact on passive cheating.

Table 4. Odds Ratio for Passive Cheating

<table>
<thead>
<tr>
<th></th>
<th>OR</th>
<th>95% CI</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>1.1524</td>
<td>0.7555-1.7578</td>
<td>0.5103</td>
</tr>
<tr>
<td>Academic Integrity</td>
<td>1.2122</td>
<td>0.8401-1.7490</td>
<td>0.3086</td>
</tr>
<tr>
<td>Collectivism</td>
<td>1.0868</td>
<td>0.7129-1.6568</td>
<td>0.6988</td>
</tr>
<tr>
<td>Agreeableness</td>
<td>1.1951</td>
<td>0.7716-1.8509</td>
<td>0.4246</td>
</tr>
<tr>
<td>Emotional Stability</td>
<td>1.7825</td>
<td>1.1656-2.7259</td>
<td>0.0076*</td>
</tr>
<tr>
<td>Conscientiousness</td>
<td>1.3265</td>
<td>0.8729-2.0158</td>
<td>0.1857</td>
</tr>
</tbody>
</table>

* Statistically significant (p<0.01)

Active Cheating

The findings differed substantially in the case of active cheating (See Table 5). The analysis showed that gender, being male, increased the likelihood of active cheating (OR = 1.92, 95% CI of 1.24-1.96). Interestingly enough though, agreeableness and conscientiousness were both found to be protective factors and decreased one’s chances of having actively cheated by 55% and 43%, respectively. Again, as for passive cheating, cultural factors such as being from a highly collective society or whether the university had a strong academic integrity culture, and emotional stability had no measurable impact on active cheating, among the medical students.

Table 5. Odds Ratio for Active Cheating

<table>
<thead>
<tr>
<th></th>
<th>OR</th>
<th>95% CI</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>1.9235</td>
<td>1.2459-2.9696</td>
<td>0.0032*</td>
</tr>
<tr>
<td>Academic Integrity</td>
<td>1.2063</td>
<td>0.7862-1.8511</td>
<td>0.3905</td>
</tr>
<tr>
<td>Collectivism</td>
<td>0.8245</td>
<td>0.5376-1.2644</td>
<td>0.3763</td>
</tr>
<tr>
<td>Agreeableness</td>
<td>0.4566</td>
<td>0.2919-0.7142</td>
<td>0.0006*</td>
</tr>
<tr>
<td>Emotional Stability</td>
<td>1.1031</td>
<td>0.7169-1.6974</td>
<td>0.6553</td>
</tr>
<tr>
<td>Conscientiousness</td>
<td>0.5777</td>
<td>0.3753-0.8892</td>
<td>0.0126*</td>
</tr>
</tbody>
</table>

* Statistically significant

The conclusion about study hypotheses may be summarized as follows:

1. Hypothesis H1(a) cannot be rejected. In fact, being male substantially increased the likelihood of active cheating.
2. Hypotheses H3(b) and H3(c) cannot be rejected. Agreeableness and conscientiousness both acted as protective factors decreasing one’s chances of having actively cheated.

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3. Hypothesis H4(a) cannot be rejected. Being emotionally stable increased the likelihood of students indulging in passive cheating.

The other hypotheses, H1(b); H2(a), H2(b); H3(a); H4(b), H4(c), and H5 were all rejected.

DISCUSSION

The analysis in identifying potential risk factors and their impact related to passive and active cheating among medical students brought up some pertinent findings. Interestingly, collectivism, was not identified as a risk factor for either passive or active cheating. Much has been written in the past few years trying to understand the impact of culture and if these differences identified in collective Middle Eastern society are pertinent to cheating (McCabe et al. 2008; Williams et al. 2014; Henning 2015). Unlike Kececi et al. (2011) who found that students from extended families in Turkey were more inclined towards academic dishonesty in almost every dimension, the odds ratios in the present study indicated that collectivism had no increased risk with cheating.

The rationale for cheating may be due to other reasons, such as those identified by Lambert et al. (2003), including time pressure and their desire for good grades. As a result of these findings, clearly the drivers that may increase the likelihood of both passive and active cheating need to be further explored beyond the link of cultural collectivism, for the actual drivers or risk factors may be more transferable between cultures than previously thought.

Furthermore, academic integrity culture did not have an impact on passive or active cheating. These findings ran in direct contrast to van Zyl & Thomas (2015) who suggested that the broader institutional culture should be addressed within the university to promote academic integrity, and Henning et al. (2014) who found correlations in relation to whether or not students have read their code of conduct. This indicates that either the actions being implemented by the university are not effective or have an impact on the medical students’ ethical decision making skills. Alternatively, could it be that medical students have a more intrinsic moral code? Medicine had a long standing code of ethics which originated from Hippocrates oath drafted 2500 years ago. The profession started as an apprenticeship with humanitarian values at heart, and the code of ethics could thus be considered to have organically grown within the discipline, rather than being external to it. This view would support Baldwin et al. (1996), who found that only 42% of US medical students believed that having a university honor code was an effective way reducing cheating.

In that vein, two personality characteristics were actually found to be protective factors, decreasing the likelihood of active cheating: conscientiousness and agreeableness, being congruent with Giluk and Postlethwaiter’s recent meta-analysis (2015). Therefore, it might be even more important to build on these strengths by promoting them among students. In addition, medical school administrators could try and identify more individual, and cultural differences that reduce the likelihood of cheating, much like primary prevention focuses on reducing future health risks, as a way to not only reduce cheating but to build academic integrity.

Finally, the role of gender and cheating was dependent on type of cheating behavior. The findings clearly showed that active cheaters were more likely to be male, which was in accord with other findings such as Chapman and Lupton (2004) and Kececi et al. (2011) both of which showed that males of both Western and Asian cultures were more likely to engage in cheating behavior than females. However, this difference was not present in passive cheating.

The likelihood of passive cheating was no different for males versus females, and while most universities and medical schools spend time addressing academic integrity -the scope and focus is predominately on active cheating behaviors, thereby sending a signal that may minimize passive cheating behaviors. Moreover, there is a need to address both genders, since over the past decade the ratio of males to females has moved towards a female majority, in medical education (Kilminster et al. 2007; Brooks 2017). Medical schools need to do more to address passive cheating. This very much falls in line with concerns raised by the General Medical Council Report (2015) from the UK showing there was more acceptance of dishonest behavior when the students perceived it to be of a low level,
such as with passive cheating. This also relates to our finding that having a high emotional stability score, was moderately associated with passive cheating. For those who are more confident and comfortable with their own abilities might be less likely to be concerned about others cheating.

Limitations of the study

There are some limitations to this study; the first being that it was a self-selecting sample. Although emphasis was placed on the confidentiality of responses and the security of respondents as regards traceability, because of the nature of the study, there is a probability that students choosing to participate might be different from those students who did not. Furthermore, these results focused on medical students, therefore the generalizability of these findings and if findings were impacted by choice of major is unclear. In addition, the construct of passive cheating should be further explored in additional studies as defined here since it includes students who do not benefit or do not engage in reporting or stopping others from cheating. Further studies should be conducted to determine, if the differences found are indicative of major for a broader discussion.

CONCLUSION

While concerns about academic integrity continue in medical schools, the goal of this was study was to try and identify potential individual, cultural and contextual differences and their impact on academic integrity, among medical students, in the Middle East. Using risk measures it was found that gender was related to active cheating, but not passive cheating, and that medical students with high emotional stability scores were more likely to allow passive cheating to occur. However, cultural factors such as collectivism and having an academic integrity culture did not have an impact on either passive or active cheating. Therefore, factors influencing academic dishonesty may be more universal within the medical schools globally. Furthermore, personality factors such as agreeableness and conscientiousness significantly reduced the likelihood of active cheating by 40-50%. Thus while many of the cultural and contextual values did not have an impact on academic dishonesty, we need to further identify other factors that reduce the potential for active and passive cheating, much like physicians do with patients in trying to reduce one’s risk by promoting healthy lifestyle behaviors as part of primary prevention.

DECLARATION OF INTERESTS

This research was approved by the Institutional Review Board of the institutions where the research was conducted. The authors declare that they have no conflict of interest.

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