

## **Determinants of academic achievements in university students: a cross-sectional study in the Gaza Strip**

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### **Abstract**

This study explored the factors that influence academic performance of medical and science students from two universities in the Gaza Strip, Palestine using a validated pilot-tested electronic questionnaire. The amount of studying hours, English proficiency and class attendance had a significant positive impact on academic performance. However, time spent on watching television, social networking and extra-curricular activities had no negative impact. Therefore, balancing study time with extracurricular activities, including social media use, is possible for high achieving students. Another factor with significant negative impact on academic performance, was responsibility for household work, mainly reported by female participants. This might remain one important factor, preventing women from excelling in the academic field and outperforming their male counterparts already early in their careers, especially in societies where women value early marriage and large families. Further research should look into the influence of the type of social media usage on academic performance.

**Keywords:** Academic performance of university students; class attendance; Gaza Strip; gender roles; health and natural science studies; Palestine; social media use

### **Introduction**

Student performance and academic achievement play an important role in creating graduates with the potential to become leaders and changers, contributing to society as well as economic and social development (Ali et al. 2009). However, student performance is affected by social, psychological, economic, environmental and personal factors, which vary from person to person as well as country to country (Mushtaq and Khan 2012). Understanding the status and determinants of academic performance of students is essential for successful and effective intervention to bring quality to education. The performance of students in universities should be a concern not only to the administrators and educators, but also to corporations in the labour market as university graduates are a main factor for success of corporations and they contribute substantially to a country's economic and social development in the future (Damayanthi and Dharmaratne 2016).

Globally, studies have shown that demographic characteristics, such as age, gender, family background, as well as social, cultural, financial and community factors strongly impact on student performance. However,

these factors differ from individual to individual as well as country to country (Kaighobadi and Allen 2008; Guney 2009; Alhajraf and Alasfour 2014; Sarsour et al. 2016; Dube and Mlotshwa 2018). So far, only a few studies exist from the regional Middle Eastern context, focusing on evaluating the impact of some factors including social networking, diet and nutritional behavior on academic performance (Abudayya et al. 2011; Ahn 2011; Halboub et al. 2016; Sarsour et al. 2016).

One study reported that the majority of university students in the Gaza Strip experience physical and psychological insecurity due to the effects of an ongoing economic siege (Elessi et al. 2019). Moreover, the 12-year blockade of the Gaza Strip (United Nations Office for the Coordination of Humanitarian Affairs, November 2018), including travel restrictions, has been stifling not only economic but also academic development, hindering academics and students to partake in recent advances and benefit from stimulation (The World Bank 2018). Often social media use and online resources are the only way to overcome this barrier and participate in international developments for students at universities in the Gaza Strip. Only students equipped with motivation and skills in creative thinking are able to develop novel or unorthodox solutions for the problems facing Gaza. Therefore, this study aims to identify factors that support or hinder academic performance in students as well as identify ways to harness supporting and mitigate hindering factors.

## **Materials and methods**

### ***Study sample***

This cross-sectional study among students from two universities in the Gaza Strip, Palestine, used an open survey method. A questionnaire was published on closed student Facebook groups from 10<sup>th</sup> September to 10<sup>th</sup> October 2018 for open accessibility to students at targeted faculties from both universities. In total, 545 students from the faculties of medicine, nursing, dentistry, pharmacy, medical science, biotechnology and science disciplines participated in the study. Participants were categorized in three groups based on academic achievement, with excellent academic performance defined as  $\geq 90\%$ , good performance as 89-75 % and poor performance as  $< 75\%$  cumulative scores.

### ***Instrument***

The study instrument was a previously validated questionnaire (Al Shawwa et al. 2015), which was modified slightly by changing the question about 'medical conferences' into 'professional conferences' in order to widen its application to other students, as the original questionnaire was designed for use in medical students. Then the instrument was translated into Arabic by two independent researchers and faculty members, one from each university, with competence in English and Arabic and experience in research in this field and survey design, followed by a back translation by a third bilingual researcher. The accuracy and quality of the translation was checked by six experts, faculty members of the local universities with experience in undergraduate education. Furthermore, a pilot study was conducted on ten students, matching the inclusion criteria for the study, to test the understanding of the questionnaire. These were not included in the study sample. All participants in the pilot study indicated that the instrument was clear, easy to comprehend and they were able to finish the questionnaire within fifteen minutes. The questionnaire consisted of five domains, collecting information on sociodemographic factors, students' lifestyles, social habits, study habits and English proficiency. Internal reliability of the questionnaire was tested with the Cronbach's  $\alpha$ , yielding good reliability of 0.847. The questionnaire was set up in such a way that questions could not be skipped, but in order to proceed with the questionnaire, an answer had to be chosen and thus avoiding missing values. Therefore, no missing values exist in this data set.

### ***Statistical analysis***

The data were analyzed using SPSS Software Version 20 to test the association between academic performance with sociodemographic characteristics, lifestyle features, social habits, study habits and English proficiency. All data are presented as frequencies and percentages and significance of associations were tested with the Chi-Squared test.

## Results

### Characteristics of participants

A total of 545 students in different disciplines, from second year to sixth year, participated in the study with 389 (71.4%) female participants. Of all students, 76 (13.9%) were 'excellent achievers', 409 (75%) 'good achievers' and 60 (11.1%) 'poor achievers'. The vast majority of surveyed students were single (95.4%) (table 1).

Table 1: Socio-demographic data of participants

| Socio-demographic factors                              | Total      | Excellent          | Good               | Poor              | P - value |
|--|------------|--------------------|--------------------|-------------------|-----------|
|  | n = 545    | N = 76<br>(13.9 %) | N = 409<br>(75.0%) | N = 60<br>(11.1%) |           |
| <b>Gender</b>  |            |                    |                    |                   |           |
| Male   | 158 (28.6) | 20 (26.3)          | 119 (29.1)         | 17 (28.3)         | 0.885     |
| Female   | 389 (71.4) | 56 (73.7)          | 290 (70.9)         | 43 (71.7)         |           |
| <b>Year of study</b>                                   |            |                    |                    |                   |           |
| 2 <sup>nd</sup> year                                   | 155 (28.4) | 33 (43.4)          | 97 (23.7)          | 25 (41.7)         | 0.002     |
| 3 <sup>rd</sup> year                                   | 156 (28.6) | 18 (23.7)          | 123 (30.1)         | 15 (25)           |           |
| 4 <sup>th</sup> year                                   | 147 (27.0) | 15 (19.7)          | 114 (27.9)         | 18 (30)           |           |
| 5 <sup>th</sup> year                                   | 49 (9.0)   | 7 (9.2)            | 42 (10.3)          | 0 (0)             |           |
| 6 <sup>th</sup> year                                   | 38 (7.0)   | 3 (3.9)            | 33 (8.1)           | 2 (3.3)           |           |
| <b>Social status</b>                                   |            |                    |                    |                   |           |
| Single   | 520 (95.4) | 76 (100)           | 391 (95.6)         | 53 (88.3)         | 0.005     |
| Married  | 25 (4.6)   | 0 (0.0)            | 18 (4.4)           | 7 (11.7)          |           |
| <b>Total family number</b>                             |            |                    |                    |                   |           |
| Less than 5  | 61 (11.2)  | 9 (11.9)           | 41 (10.0)          | 11 (18.3)         | 0.159     |
| More than 5  | 484 (88.8) | 67 (88.2)          | 368 (90.0)         | 49 (81.7)         |           |
| <b>Do you live with your family</b>                    |            |                    |                    |                   |           |
| Yes  | 530 (97.2) | 76 (100)           | 398 (97.3)         | 56 (93.3)         | 0.035     |
| No   | 15 (2.8)   | 0 (0.0)            | 11 (2.7)           | 4 (6.7)           |           |
| <b>Have any problems occurred in the family</b>        |            |                    |                    |                   |           |
| Divorced parents                                       | 7 (1.3)    | 1 (1.3)            | 4 (1.0)            | 2 (3.3)           | 0.335     |
| Death of a first relative during your medical studying | 18 (3.3)   | 3 (3.9)            | 13 (3.2)           | 2 (3.3)           |           |
| A family member with chronic illnesses                 | 97 (17.8)  | 7 (9.2)            | 78 (19.1)          | 12 (20.0)         |           |
| I do not have any problem or death in my family        | 423 (77.6) | 65 (85.5)          | 314 (76.8)         | 44 (73.3)         |           |
| <b>Monthly family income</b>                           |            |                    |                    |                   |           |
| Less than 1000 ILS (\$300)                             | 108 (19.8) | 13 (17.1)          | 78 (19.1)          | 17 (28.3)         | 0.608     |
| 1000 – 2000 ILS (\$300-600)                            | 175 (32.1) | 23 (30.3)          | 137 (33.5)         | 15 (25.0)         |           |
| 2000 – 3000 ILS (\$600-\$900)                          | 129 (23.7) | 20 (26.3)          | 94 (23.0)          | 15 (25.0)         |           |
| More than 3000 ILS (\$900)                             | 133 (24.4) | 20 (26.3)          | 100 (24.4)         | 13 (21.7)         |           |
| <b>Financially responsibility</b>                      |            |                    |                    |                   |           |
| No   | 530 (97.2) | 76 (100)           | 397 (97.1)         | 57 (95.0)         | 0.189     |
| Yes  | 15 (2.8)   | 0 (0.0)            | 12 (2.9)           | 3 (5.0)           |           |
| <b>Transportation to college</b>                       |            |                    |                    |                   |           |
| Private driver   | 4 (0.7)    | 0 (0.0)            | 4 (1)              | 0 (0.0)           | 0.517     |
| With a family member                                   | 14 (2.6)   | 3 (3.9)            | 11 (2.7)           | 0 (0.0)           |           |
| I drive my own car                                     | 8 (1.5)    | 2 (2.6)            | 6 (1.5)            | 0 (0.0)           |           |
| Public transportation (taxi)                           | 519 (95.2) | 71 (93.4)          | 388 (94.9)         | 60 (100)          |           |
| <b>Share your transportation method with others</b>    |            |                    |                    |                   |           |
| No   | 193 (35.4) | 35 (46.1)          | 139 (34)           | 19 (31.7)         | 0.106     |
| Yes  | 352 (64.6) | 41 (53.9)          | 270 (66)           | 41 (68.3)         |           |
| <b>Responsible for doing household chores</b>          |            |                    |                    |                   |           |
| No   | 138 (25.3) | 26 (34.2)          | 101 (24.7)         | 11 (18.3)         | 0.030     |
| Yes  | 407(74.7)  | 50 (65.8)          | 308 (75.3)         | 49 (81.7)         |           |

### *Socio-demographic and lifestyle factors*

Social status, year of study and living with family were found to have a significant relation with student performance ( $p \leq 0.05$ ) with the progress in years of study, living away from family and being married exerting a negative impact on students' academic performance. However, gender, family size and the presence of family problems were not found to be significant factors ( $p > 0.05$ ) and neither were monthly family income, or whether the student was financially responsible for someone else than him/herself (table 1).

Interestingly, responsibility for household work, described in the questionnaires as 'spending time performing household chores' was found to have a significant correlation with performance in this sample with 308 students (75.3%) in the moderate achievers group and 45 (81.7%) in the poor achievers group reporting responsibility for household chores, compared to only 50 (65.5%) in the high achievers group ( $p \leq 0.05$ ; table 1). Therefore, responsibility for such chores negatively affected academic achievements. Furthermore, this factor affected female students significantly more than males, with 310 (79.7%) female students reporting responsibility for household chores, compared to 97 (62.2%) males ( $p = 0.000$ ; table 2).

Table 2: Relationship between responsibility for household chores and gender

|                | No         | Yes         | Total      |
|----------------|------------|-------------|------------|
| <b>Male</b>    | 59 (37.8%) | 97 (62.2%)  | 156 (100%) |
| <b>Female</b>  | 79 (20.3%) | 310 (79.7%) | 389 (100%) |
| <b>Total</b>   | 138        | 407         | 545 (100%) |
| <b>p-value</b> | 0.000      |             |            |

Stressful life events, such as death or chronic illness of a close relative, did not have significant impact on performance, with 423 participants (77.6%) reporting no such events in their lives. Furthermore, time spent on watching television, social networking, social life, extracurricular activities and attending medical conferences had no significant impact on student performance, and neither did drinking caffeinated beverages and smoking show any significant difference among groups (table 3). Furthermore, no significant difference was observed in regard to napping habits and sleeping hours ( $p > 0.05$ ; table 3).

### *Study habits*

Not surprisingly, significant impact was made by the numbers of study hours during the day and at weekends, with 82.9% of the 'excellent achievers' studying more than three hours a day and only nine (11.8%) reporting not studying at weekends, compared to 65.8% and 23.5% in the moderate and 43.3% and 25.0% respectively, in the poor achievers groups ( $p \leq 0.05$ ; Table 4). However, no significant impact on academic performance was noted between students studying alone, with one colleague or in groups.

Lack of proficiency in English was reported by only two students (2.6%) of the excellent achievers group, but 14 (23.3%) students in the poor achievers group, who also reported language difficulties while studying. Poor English language skills had a significant negative impact on academic performance in this sample ( $p \leq 0.05$ ; table 4). Further significant differences were observed among groups in regard to attendance of lectures, problem-based learning (PBL) sessions, and clinical teachings, where none of the excellent students reported their absence ( $p \leq 0.05$ ; table 4). However, attending practical sessions showed no significant difference among groups ( $p > 0.05$ ). Exam preparation time had significant positive impact on academic performance ( $p \leq 0.05$ ) with students in the high achievers group reporting significantly longer preparation time before exams than those in the moderate or poor achievers groups (table 4).

Table 3: Lifestyle habits

| Lifestyle factor  | Total      | Excellent         | Good               | Poor              | P - value |
|---|------------|-------------------|--------------------|-------------------|-----------|
|   | N = 545    | n = 76<br>(13.9%) | N = 409<br>(75.0%) | N = 60<br>(11.1%) |           |
| <b>Watching movies, series, and music/day</b>                   |            |                   |                    |                   |           |
| ≤2 hours/day  | 205 (37.6) | 35 (46.1)         | 149 (36.4)         | 21 (35.0)         | 0.489     |
| 3-4hours/days   | 110 (20.2) | 9 (11.8)          | 87 (21.3)          | 14 (23.3)         |           |
| >4hours/day   | 30 (5.5)   | 3 (3.9)           | 23 (5.6)           | 4 (6.7)           |           |
| I don't watch   | 200(36.7)  | 29 (38.2)         | 150 (36.7)         | 21 (35.0)         |           |
| <b>Social networking/chatting</b>                               |            |                   |                    |                   |           |
| ≤2 hours/day  | 231 (42.4) | 37 (48.7)         | 168 (41.1)         | 26 (43.3)         | 0.146     |
| 3-4hours/days   | 185 (33.9) | 25 (32.9)         | 145 (35.5)         | 15 (25.0)         |           |
| >4hours/day   | 116 (21.3) | 11 (14.5)         | 86 (21)            | 19 (31.7)         |           |
| I don't use it  | 13 (2.4)   | 3 (3.9)           | 10 (2.4)           | 0 (0.0)           |           |
| <b>Spending time on hobbies</b>                                 |            |                   |                    |                   |           |
| I spend some of my time on my hobbies every day                 | 146 (26.8) | 24 (31.6)         | 108 (26.4)         | 14 (23.3)         | 0.289     |
| I spend some of my time on my hobbies once every week           | 157 (28.8) | 27 (35.5)         | 116(28.4)          | 14 (23.3)         |           |
| I spend some of my time on my hobbies at least once every month | 87 (16.0)  | 9 (11.8)          | 69 (16.9)          | 9 (15.0)          |           |
| I do not have a hobby   | 155 (28.4) | 16 (21.1)         | 116 (28.4)         | 23 (38.3)         |           |
| <b>Smoking</b>  |            |                   |                    |                   |           |
| I am a smoker   | 6 (1.1)    | 0 (0.0)           | 6 (1.5)            | 0 (0.0)           | 0.421     |
| I smoke at least once every week                                | 14 (2.6)   | 1 (1.3)           | 9 (2.2)            | 4 (6.7)           |           |
| I am a social smoker  | 4 (0.7)    | 0 (0.0)           | 4 (1.0)            | 0 (0.0)           |           |
| I do not smoke  | 514 (94.3) | 74 (97.4)         | 385 (94.1)         | 55 (91.7)         |           |
| I used to smoke but I quit                                      | 7 (1.3)    | 1 (1.3)           | 5 (1.2)            | 1 (1.7)           |           |
| <b>Intake of caffeine containing beverages</b>                  |            |                   |                    |                   |           |
| Regularly consume such beverages once every day                 | 193 (35.4) | 24 (31.6)         | 143 (35)           | 26 (43.3)         | 0.078     |
| Regularly consume such beverages several times every day        | 185 (33.9) | 22 (28.9)         | 139 (34)           | 24 (40.0)         |           |
| I do not consume caffeinated drinks                             | 167 (30.6) | 30 (39.5)         | 127 (31.1)         | 10 (16.7)         |           |
| <b>Social life</b>  |            |                   |                    |                   |           |
| Spend time with my friend every day                             | 78 (14.3)  | 11 (14.5)         | 57 (13.9)          | 10 (16.7)         | 0.928     |
| spend ≤3 times/week with my friends                             | 213 (39.1) | 30 (39.5)         | 164 (40.1)         | 19 (31.7)         |           |
| Spend >3times/week with my friends                              | 50 (9.2)   | 7 (9.2)           | 38 (9.3)           | 5 (8.3)           |           |
| Do not spend time with my friends                               | 204 (37.4) | 28 (36.8)         | 150 (36.7)         | 26 (43.3)         |           |
| <b>Extracurricular activities</b>                               |            |                   |                    |                   |           |
| Spend at least 5 hours/week on such activities                  | 61 (11.2)  | 11 (14.5)         | 43 (10.5)          | 7 (11.7)          | 0.900     |
| Spend less than 5 hours/week                                    | 47 (8.6)   | 6 (7.9)           | 36 (8.8)           | 5 (8.3)           |           |
| Participate in 1-2 events every year                            | 217 (39.8) | 32 (42.1)         | 164 (40.1)         | 21 (35)           |           |
| Do not spend time on extracurricular activities                 | 220 (40.4) | 27 (35.5)         | 166 (40.6)         | 27 (45)           |           |
| <b>Attendance at professional conferences and seminars</b>      |            |                   |                    |                   |           |
| Attend less than four events/year                               | 255 (46.8) | 33 (43.4)         | 196 (47.9)         | 26 (43.3)         | 0.214     |
| attend more than four /year                                     | 82 (15)    | 18 (23.7)         | 56 (13.7)          | 8 (13.3)          |           |
| I do not attend such events                                     | 208 (38.2) | 25 (32.9)         | 157 (38.4)         | 26 (43.3)         |           |
| <b>After university hours</b>                                   |            |                   |                    |                   |           |
| Take a nap before studying                                      | 363 (66.6) | 45 (59.2)         | 275 (67.2)         | 43 (71.7)         | 0.268     |
| Do not take naps  | 182 (33.4) | 31 (40.8)         | 134 (32.8)         | 17 (28.3)         |           |
| <b>Sleeping hours per day</b>                                   |            |                   |                    |                   |           |
| I sleep ≤6 hours/days   | 78 (14.3)  | 12 (15.8)         | 51 (12.5)          | 15 (25)           | 0.056     |
| I sleep 6-8 hours/day   | 367 (67.3) | 55 (72.4)         | 277 (67.7)         | 35 (58.3)         |           |
| I sleep ≥8 hours/day  | 100 (18.3) | 9 (11.8)          | 81 (19.8)          | 10 (16.7)         |           |

Table 4: Study habits

|   | Total      | Excellent | Good       | Poor      | p-value |
|---|------------|-----------|------------|-----------|---------|
| <b>When I study</b>   |            |           |            |           |         |
| I like to study alone   | 459 (84.2) | 65 (85.5) | 342 (83.6) | 52 (86.7) | 0.677   |
| I like to study with one of my colleagues                           | 68 (12.5)  | 7 (9.2)   | 54 (13.2)  | 7 (11.7)  |         |
| I like to study in groups   | 18 (3.3)   | 4 (5.3)   | 13 (3.2)   | 1 (1.7)   |         |
| <b>English proficiency</b>  |            |           |            |           |         |
| I speak fluent English  | 74 (13.6)  | 11 (14.5) | 57 (13.9)  | 6 (10)    | 0.000   |
| My English is good enough to study and conversations                | 428 (78.5) | 63 (82.9) | 325 (79.5) | 40 (66.7) |         |
| My English is deficient, that I face some difficulties when I study | 43 (7.9)   | 2 (2.6)   | 27 (6.6)   | 14 (23.3) |         |
| <b>During the day, I study</b>                                      |            |           |            |           |         |
| ≤2 hours/day  | 99 (18.2)  | 7 (9.2)   | 75 (18.3)  | 17 (28.3) | 0.001   |
| 3–4 hours/day   | 227 (41.7) | 39 (51.3) | 173 (42.3) | 15 (25)   |         |
| ≥4 hours/day  | 131(24)    | 24 (31.6) | 96 (23.5)  | 11 (18.3) |         |
| I do not study daily  | 88 (16.1)  | 6 (7.9)   | 65 (15.9)  | 17 (28.3) |         |
| <b>During the weekends, I study</b>                                 |            |           |            |           |         |
| ≤5 hours/day  | 218 (40)   | 23 (30.3) | 171 (41.8) | 24 (40)   | 0.012   |
| 5–8 hours/day   | 148 (27.2) | 29 (38.2) | 103 (25.2) | 16 (26.7) |         |
| 8 hours/day   | 60 (11)    | 15 (19.7) | 40 (9.8)   | 5 (8.3)   |         |
| I do not study during weekends                                      | 119 (21.8) | 9 (11.8)  | 95 (23.2)  | 15 (25)   |         |
| <b>Lectures</b>   |            |           |            |           |         |
| 100%  | 394 (72.3) | 70 (92.1) | 289 (70.7) | 35 (58.3) | 0.001   |
| 75%   | 124 (22.8) | 5 (6.6)   | 99 (24.2)  | 20 (33.3) |         |
| 50%   | 19 (3.5)   | 0 (0)     | 17 (4.2)   | 2 (3.3)   |         |
| 25%   | 6 (1.1)    | 1 (1.3)   | 3 (0.7)    | 2 (3.3)   |         |
| I do not attend   | 2 (0.4)    | 0 (0)     | 1 (0.2)    | 1 (1.7)   |         |
| <b>Practical sessions</b>   |            |           |            |           |         |
| 100%  | 74 (13.6)  | 8 (10.5)  | 55 (13.4)  | 11 (18.3) | 0.822   |
| 75%   | 166 (30.5) | 24 (31.6) | 124 (30.3) | 18 (30)   |         |
| 50%   | 137 (25.1) | 19 (25)   | 107 (26.2) | 11 (18.3) |         |
| 25%   | 83 (15.2)  | 14 (18.4) | 61 (14.9)  | 8 (13.3)  |         |
| I do not attend   | 85 (15.6)  | 11 (14.5) | 62 (15.2)  | 12 (20)   |         |
| <b>Problem-based learning</b>                                       |            |           |            |           |         |
| 100%  | 79 (14.5)  | 15 (19.7) | 59 (14.4)  | 5 (8.3)   | 0.002   |
| 75%   | 192( 35.2) | 33 (43.4) | 143 (35)   | 16 (26.7) |         |
| 50%   | 147 (27)   | 19 (25)   | 111 (27.1) | 17 (28.3) |         |
| 25%   | 105 (19.3) | 9 (11.8)  | 82 (20)    | 14 (23.3) |         |
| I do not attend   | 22 (4)     | 0 (0)     | 14 (3.4)   | 8 (13.3)  |         |
| <b>Practical / clinical teaching</b>                                |            |           |            |           |         |
| 100%  | 304 (55.8) | 52 (68.4) | 228 (55.7) | 24 (40)   | 0.000   |
| 75%   | 185 (33.9) | 18 (23.7) | 140 (34.2) | 27 (45)   |         |
| 50%   | 15 (2.8)   | 6 (7.9)   | 6 (1.5)    | 3 (5)     |         |
| 25%   | 41(7.5)    | 0 (0)     | 35 (8.6)   | 6 (10)    |         |
| I do not attend   | 0          | 0         | 0          | 0         |         |
| <b>In a course of 2–3 months duration</b>                           |            |           |            |           |         |
| 1 month before exam   | 152 (27.9) | 22 (28.9) | 118 (28.9) | 12 (20.0) | 0.022   |
| 2–3 weeks before exam   | 238 (43.7) | 40 (52.6) | 174 (42.5) | 24 (40.0) |         |
| Few days before exam  | 155 (28.4) | 14 (18.4) | 117 (28.6) | 24 (40.0) |         |

## Discussion

This study among university students of the Gaza Strip, Palestine, found that academic performance was negatively affected by responsibility for household chores and poor English proficiency. On the other hand, greater amount of studying hours, regular attendance of lectures, problem-based-learning sessions clinical teaching as well as longer time spent on preparation for exams had a significant positive impact on academic



performance. Interestingly, no difference between students with different academic achievements was found in social media usage and networking, hobbies or time spent with friends.

Universities in Gaza follow mostly traditional curricula with frontal teaching styles and frequent examinations, taking place at the end of each course, as mid-term examinations as well as final examinations at the end of the year, mostly as multiple-choice examinations. Little emphasis is generally put on innovative learning styles, small group work or individual assignments. Therefore, it is not surprising that the two most significant factors found to influence academic performance in this study were lecture attendance and study time. This is consistent with several previous studies that confirmed the importance of class attendance for academic success with students, who attend more classes, earning higher grades in examinations and has been the opinion of researchers for a long time (Kirby and McElroy 2003; Moore et al. 2003; Ajiboye and Tella 2006; Purcell 2007; Gupta and Saks 2013; Martin et al. 2013; Tetteh 2018). In how far the positive effect of class attendance on lecture outcome is influenced by student characteristics, such as motivation and aptitude or teaching styles remains controversial with some studies finding no influence (Nyamapfene 2010) while others found a remaining influence by unobservable student traits after controlling for student characteristics (Martins and Walker 2006; Andrietti 2014). Tetteh found in a study including 701 university students in Ghana, a link between lecture attendance and study time, both of which independently impacted positively on learning outcomes (2018). Andrietti and Velasco reported that the positive impact of study time on learning outcome exceeded that of lecture attendance at a public university in Spain (2015). Therefore, best achievers displayed common habits of regularly attending lectures as well as regular study times (Nguyen et al. 2018).

The significance of class attendance might be due to the influence of the environment created by the lecturers, motivating and stimulating students and thus increasing their interest for the subject as well as their study efforts. However, efforts to just increase student attendance of lectures might not be as effective in improving learning outcomes, as shifts from a traditional lecture based teaching style to an instructional setting encouraging higher student effort and classroom participation.(Lom 2012) This study also found that attendance of problem-based discussion sessions improved the academic performance of students, possibly by encouraging better integration of new information in the students' existing knowledge base, increasing the interaction between knowledge already available in the participants and the new information to be learnt, making the resulting knowledge more accessible and remembered better (De Grave et al. 2001; Andrietti and Velasco 2015) .

Therefore, focusing on increasing class attendance in tandem with shifting traditional learning styles to more student-based learning with participation and increased student effort might be most effective. This would have the additional effect of contributing to improved learning outcomes by increasing study time of the students (Artés and Rahona 2013; Andrietti and Velasco 2015).

### ***Proficiency in English***

Another significant factor exerting a positive impact on learning outcomes was the students' proficiency in English. Throughout the academic world, English has become important and enables students to follow literature, books, journal articles or reviews in their field that are published only in English. In Palestine, as in many other countries, the teaching language at the university in some scientific specialties, such as medicine, nursing, pharmacy, natural sciences, is English. Therefore, proficiency in English enables students to follow learning content easier, as well as answer examination questions better, as these are also in English. These findings were supported by other studies, who found English ability to be a significant predictor of academic performance (Fakeye and Ogunsiji 2009; Sadeghi et al. 2013; Kaliyadan et al. 2015).

### ***Years of study***

One of the factors influencing academic performance in this study, were years of study, where academic performance fell with the years of study. This finding is consistent with other studies (Da Wan and Cheo 2012; Alhajraf and Alasfour 2014) which suggested that the beginners in the early years do better than

students in more advanced years as age negatively impacted on academic performance of students. As the study load increases with years of study, this might cause a decrease in the percentage marks. Furthermore, household responsibilities of students might increase with age and thus contribute to reduced academic performance, which is also supported by this study. Significant impact on academic performance was found with married students and those students sharing responsibility for household chores, achieving significantly worse than single students and those with no household responsibilities. However, a study from Saudi Arabia reported that married students demonstrated higher academic performance (Al Shawwa et al. 2015), suggesting other contributing factors. One potential factor resulting in better academic achievement in the early years might be a gradual shift from mostly classroom based teaching and memorization, which students are familiar with in secondary school (especially in areas that rely heavily on traditional and frontal teaching styles, like Palestine) to application of knowledge, which is altogether more challenging and might mean a shift to more autodidactic learning. In the most advanced years of study, there are many courses, for which self-study is generally more demanding. Previous studies show that as allocated self-study hours increase, the time spent on self-study also increases (Jansen 2004; Barbosa et al. 2017).

### ***Gender***

Interestingly, gender was not found to influence student performance, although female secondary school students in Gaza do consistently better than male students (The World Bank 2018). The finding is consistent with other international studies (Jackling and Anderson 1998; Gammie 2003; Glory and Ihenko 2017). Tetteh did not detect any relationship between gender and academic performance (2018). In contrast, other studies found gender to have an influence on academic performance during undergraduate studies with female achievement higher than male (Al-Mutairi 2011; Alhajraf and Alasfour 2014; Sarsour et al. 2016) In Gaza, mostly females in the family take on responsibility for household chores and this is reflected in 79.7% of female students claiming responsibility for household chores, compared to 62.2% of male students. This burden might still hold women back from their potential achievements in Gaza, as it was one of the factors with significant negative impact on academic performance.

### ***Social media***

Previous studies showed that times spent on social media correlated negatively with academic performance (Rithika and Selvaraj 2013; Abdulahi et al. 2014; Al Shawwa et al. 2015). In contrast, in this study time spent on social media did not impact on students' academic performance. Social media is a frequently used platform for entertainment and use among Palestinian young adults has been reported as prolific (Ahn 2011). However, this study showed that students in the "high achievers" group managed to find a good balance between social and academic activities in their lives. Engagement in extracurricular activities might have a positive impact on their academic performance, increasing motivation and engagement (Wilson 2009). Moreover, social media, such as Facebook groups, enable students to communicate, share knowledge, cooperate on assignments or inquire about issues they did not understand and thus improve learning outcomes, as reported in previous studies (Rithika and Selvaraj 2013; El-Badawy and Hashem 2015). Therefore, the impact of social media on academic performance might depend on the purpose of its use. Furthermore, Gaza suffers from longstanding movement restrictions inside and outside of its area and professionals as well as students cannot easily partake in international developments or knowledge exchange (United Nations Office for the Coordination of Humanitarian Affairs, November 2018; The World Bank 2018). This makes social media one of the few ways to participate in new developments or get further stimulation in their academic fields. Further research to determine the impact of time spent on social media for academic purposes compared to time spent for other usages is needed to examine this point.

### ***Strengths and limitations***

The main strengths of this study are the large sample size and the fact that students originated from different universities, colleges and different faculties. Furthermore, reducing selection bias by sampling on an electronic platform via closed student Facebook groups and university websites, opened participation to a wide range of potential participants, making the sample more representative and providing anonymity for participants. Limitations include the reliance on participants' assessment of their own English proficiency,



time spent on social media and their GPA, without checking the latter against the recorded grades, as recruitment was anonymous. Another limitation was the high proportion of female participants. It is not uncommon in survey studies to have a higher proportion of female participants, but the discrepancy is exaggerated in this sample, possibly because the research team was female or because females are more active in Facebook groups, where the survey was published. In Gaza, male students have more opportunities to meet their friends outside, while females stay inside more, possibly encouraging social media use, including the targeted Facebook groups.

### **Conclusion**

Class attendance and study time remain the most important modifiable factors with positive impact on learning outcomes. Universities should work on these by encouraging class attendance as well as applying teaching methods that involve students more and engage them actively in the learning process and thus leading to longer study times. Furthermore, balancing work with extracurricular activities, including social media use, is possible also for those in the highest achieving groups and might even contribute to their better learning outcomes. Finally, gender did not show a significant effect on learning outcomes in this study, but involvement in household chores did have a negative impact, significantly more reported by female participants. Therefore, this extra responsibility for females might still hold women back from academic excellence, when compared to their male counterparts, starting early in their careers.

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All authors declare no conflicts of interests.

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