

#FeesMustFall2016: Perceived and measured effect on clinical medical students

H Brits,¹ MB ChB, MFamMed, MHPE; G Joubert,² BA, MSc; L Lomberg,¹ 2nd-year medical student; P Djan,¹ 2nd-year medical student; G Makoro,¹ 2nd-year medical student; M Mokoena,¹ 2nd-year medical student; P Malate,¹ 2nd-year medical student; D Tengu,¹ 2nd-year medical student

¹ Department of Family Medicine, Faculty of Health Sciences, University of the Free State, Bloemfontein, South Africa

² Department of Biostatistics, Faculty of Health Sciences, University of the Free State, Bloemfontein, South Africa

Corresponding author: H Brits (britsh@ufs.ac.za)

Background. Medical students are under immense academic stress. Campus unrest can contribute to stress and influence academic performance, social behaviour, emotional stability and financial expenses.

Objectives. To investigate the effects of #FeesMustFall2016 (#FMF2016) on the 2016 3rd-year (semester 6) clinical medical students at the University of the Free State (UFS), Bloemfontein, South Africa.

Methods. In phase 1 of the project, anonymous questionnaires were completed by the clinical students who experienced physical test disruption during #FMF2016. Opinions regarding academic performance, financial expenses, behaviour changes and stress levels were gathered. The students also completed a formal post-traumatic stress screening assessment. In phase 2 of the project, the academic performance of these students was compared with that of students not affected by #FMF2016.

Results. Of the target population of 138 students, 87.0% completed the questionnaires. Three-quarters of the respondents reported a negative effect on academic performance, and most did not believe that the delivering of lectures on Blackboard was a good way of training. Alcohol consumption increased in 31.9% of the students. Criteria for post-traumatic stress disorder (PTSD) were met in 12.7% of students. Compared with previous and later cohorts of students there were no clear differences regarding marks, but there was a tendency towards poorer performance and more failures the next year.

Conclusions. Semester 6 medical students at UFS reported that the #FMF2016 protests had a negative effect on academic, social, financial and stress aspects. PTSD was present in 12.7% of students compared with 7.8% in similar populations.

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Medical school is a highly competitive and stressful environment for most medical students.^[1] The prevalence of stress experienced by medical students has been reported to vary between 41.9% and 63.7% in different parts of the world.^[2-4] Two South African (SA) studies reported stress levels as high as 78% among medical students.^[5,6] Information overload, lack of holidays, difficulty with transport to training sites, and socially related factors in the clinical environment are some of the issues that contribute to the stress experienced by medical students.^[2,7,8] It is therefore not surprising that studies have found medical students to be more distressed than students in any other undergraduate course.^[2,3]

The effect of added external stress on already high levels of stress is unpredictable.^[9] It can be expected that added uncontrollable external stress may have negative effects on already stressed individuals such as medical students. The September/October 2016 #FeesMustFall (#FMF2016) protests caused disruption to the academic curriculum of most SA universities, including the University of the Free State (UFS).^[10]

Student protests regarding high education fees started at Fort Hare University and the Cape Peninsula University of Technology as long ago as 1994. However, owing to their small scale, these protests did not make headline news.^[11] In October 2015, student protests started at the University of the Witwatersrand, spreading to the University of Cape Town and Rhodes University, and subsequently to most universities in SA. After government intervention, the protests stopped for a while.^[12] However, in mid-August 2016, the Minister of Higher Education announced a maximum fee increase of 8% for

universities. Within days, students at most universities participated in the #FMF2016 campaign.^[13] #FMF2016 resulted in violent protests and the eventual closure of most SA universities towards the end of 2016.^[14]

University strikes are common at Canadian universities.^[15-18] A study at York University in Toronto emphasised the negative effects that student protests had on the students in general.^[15] The study used self-administered questionnaires to collect data from students regarding academic performance and future plans, anxiety levels, available internet information and social behaviour during the strike. In conclusion, studies suggested that more research is needed on students' reactions to similar university crises and that universities should commit to maintaining informative websites to keep students informed.^[15,16] These studies all reported on student perceptions, and none of the claims was verified.

In SA, labour protests are common and much information is available on the effect of protests on the economy. However, no studies could be found on the effect of university strikes on students.^[19,20] If more information is available, better planning and support can be offered to all affected parties during protests.

Objectives

To determine the perceptions and measured effect of the #FMF2016 protest on the 2016 3rd-year (semester 6) undergraduate medical students at UFS who experienced physical test disruption and temporary interruption of classes and clinical training. Specific objectives were: (i) to assess the perceptions of students regarding the

effect of the protests on academic performance, social behaviour and financial implications; (ii) to assess students' perceptions regarding information sharing and support of authorities during the protest; (iii) to determine the presence of post-traumatic stress disorder (PTSD) after students experienced violent and physical test disruption, using a validated post-traumatic stress tool; and (iv) to measure the effect of #FMF2016 on academic performance by comparing end-of-year examination marks with marks of students not affected by protests.

Methods

To address the study objectives, the project consisted of two phases. In phase 1, a descriptive study was performed to gather students' perceptions of the effect of #FMF2016, and screening for PTSD took place. In phase 2, examination marks of students affected by #FMF2016 were compared with marks of students not affected by #FMF2016.

Phase 1: Students' perceptions of the effect of #FMF2016 and results of PTSD screening

Study population and sampling

The study population consisted of 138 medical students who were in their 3rd year in 2016 at the UFS Bloemfontein campus. This class was selected because they experienced physical test disruptions and violent behaviour at a university venue. The 4th- and 5th-year clinical students received most of their training at off-campus clinical sites and in small groups, and were therefore not affected as much by the #FMF2016 unrest. The entire class was included, so no sampling method was required.

Measurements

The perceived effects of the protest were measured using voluntary, anonymous self-administered questionnaires. Completion of the questionnaires implied consent. The first part of the questionnaire gathered demographic information on age, gender, accommodation, and source of funding for the students' studies. This was followed by 25 statements on the perceived effect of the protests on academic performance, finances and social behaviour, as well as students' attitudes to the UFS management, the protest in general, and stress experienced. These questions were derived from the results and recommendations of the studies referenced at the beginning of the article.^[15-18] Students had four options for each statement, namely 'strongly disagree', 'disagree', 'agree' and 'strongly agree'. The last part of the questionnaire included a validated PTSD screening tool developed by Brewin *et al.*^[21] The screening tool consisted of 10 questions and, according to the instructions, a score of ≥ 6 was considered positive for PTSD. The questionnaire was only available in English, as the Brewin questionnaire was only validated in English. Class group leaders distributed and collected the completed questionnaires. The study was performed in the second semester of 2017 after ethical and UFS permission had been obtained.

Pilot study

A pilot study was conducted to test the clarity and appropriateness of the questionnaire. Twenty 2017 3rd-year medical students filled in the questionnaire. Minor changes were made to improve the flow of the questionnaire.

Data analysis

Data were filled in on Excel 2016 spreadsheets (Microsoft, USA) and double-checked for errors. The Department of Biostatistics, Faculty of Health Sciences, summarised the data using frequencies and

percentages (categorical variables) and mean (age). For analysis, the options 'strongly disagree' and 'disagree' were grouped, as were 'agree' and 'strongly agree'. This was done because of the small numbers in many subcategories.

Phase 2: Comparison of student marks

Study population and sampling

The study population consisted of the 3rd-, 4th- and 5th-year medical students at UFS who took part in the end-of-year assessment during 2015, 2016 and 2017, respectively.

Measurements

As a first step, the mid-year 3rd-year examination marks of the student groups included in the study were compared to establish whether the groups were comparable. Secondly, the marks of the 2016 3rd-year students were then compared with the 3rd-year marks of the 2015 and 2017 students. The 4th-year marks of these students were also compared with the 4th-year marks of the 2015 and 2016 students. Finally, as the 2016 4th- and 5th-year students were also affected by the #FMF2016 protests, their marks were compared with the students of 2015 and 2017.

After ethics committee and university authority approval, student marks, linked to student numbers, were obtained from the official database of the Faculty of Health Sciences. This is a secure database with password protection, and only authorised access is permitted.

Pilot study

No pilot study was conducted, as the specific data required and the data analysis were discussed with a biostatistician before the data gathering.

Data analysis

The data were available in Excel 2016 spreadsheets, and were sorted according to years and modules. The average mark and percentage of failures over all modules were calculated for each year group and then compared using *t*-tests (average marks) and Fisher's exact test (percentage of failures).

Ethical considerations

Ethical approval to conduct the study was obtained from the Health Sciences Research Ethics Committee of UFS (ref. no. HSREC-S 24/2017). Approval to include students and use student marks was granted by the appropriate authorities of UFS. No person was identified, as the questionnaires were anonymous and only student numbers were used for the mark comparison. A psychologist was available to assist students who experienced high levels of stress during questionnaire completion.

Results

Phase 1: Students' perceptions of the effect of #FMF2016 and results of PTSD screening

A total of 120 students completed the questionnaire. The student response rate was 87.0%, with an equal distribution between males and females. Student ages varied between 20 and 28 years, with a mean of 22 years. Before the protest, 22.2% of students lived on campus, which decreased to 7.5% after the protests.

The majority of the students used a combination of funding sources for their studies, with parents and family contributing in >60% of cases. Fewer than 50% of students studied with some type of bursary. Only one student indicated that he/she received funding from the National Student Financial Aid Scheme.

Most of the students (74.0%) agreed that #FMF2016 had a negative effect on academic performance (Fig. 1). Almost all the students (92.3%) disagreed with the statement that they spent less money during the protests. Behaviour changed negatively, with 40.0% of students reporting changes in sleeping patterns and 31.9% reporting that they consumed more alcohol. Fig. 1 is a summary of some of their responses.

In general, students felt negative about the protests, with 79.7% fearing a reoccurrence the following year. Poor communication with students on the part of the authorities was claimed by 56.7% of students. Some of the general responses are summarised in Table 1.

The self-reported stress levels of the students were a median of 6 out of 10 during the protest and 5 out of 10 at the time of data collection (range 0 - 10 during both occasions). The largest percentage of students (42.5%) reported higher levels of stress during the protest, followed by 29.2% who reported the same levels during the protest as currently experienced, and 28.3% who reported lower stress levels during the protest. Using the validated PTSD screening tool, 12.7% of students screened positive for PTSD.

PTSD was slightly higher in female (15.8%) than male students (10.0%) ($p=0.35$). Male students were significantly more likely to agree that they consumed more alcohol during the protest (43.3%) than female students (20.3%) ($p=0.01$). Female students were more likely to have supported the cause of the protest (47.5%) than male students (30.5%) ($p=0.06$), but more males (33.3% v. 25.4% of females; $p=0.34$) reported having felt pressurised to join the protest. Only 3.3% of males indicated that they had participated in the protest, compared with 8.5% of female students ($p=0.27$). No significant differences were found between age groups (<23; ≥23 years) with regard to these variables.

Phase 2: Comparison of student marks

The average entry marks into the clinical phase of the study for the different year groups used in the study were 63.6% (2014), 70.1% (2015), 65.4% (2016) and 63.1% (2017). There was no statistically significant difference between the groups, and the groups were considered comparable.

The 2016 3rd-year class experienced the physical test disruption; however, all 2016

classes were affected by #FMF2016. The 2016 3rd-year students were 4th-years in 2017. Per study year (3rd, 4th or 5th), no statistically significant differences were observed between the marks of students affected and not affected by #FMF2016. The mean percentage and failure percentage in the end-of-year examinations for each year group are displayed in Table 2.

Discussion

The response rate of 87.0%, equal gender split and age distribution are in line with what was expected for this group of medical students, and generalisability of results is therefore possible.

Possibly the most important aspect of the #FMF2016 campaign was student fees: whether there should be a limited increase or no increase in university fees, or free tuition for students.^{13,14} University fees would have a direct influence on this group of students, as fewer than 50% of them reported that they had bursaries to support some or all of their study expenses.

Many students will be in debt when they complete their studies, and a disruptive study environment where studies may need to be extended may put an extra financial burden on them. After the protests, more than half of the students who stayed in university hostels left for off-campus accommodation, which is much more expensive. However, #FMF2016 cannot be seen as the only factor contributing to this change, as many clinical medical students find it difficult to balance academic and hostel life and prefer off-campus accommodation, despite the higher accommodation and transport cost. Only 7.7% of students agreed with the statement that they spent less money during the protests, while 44.5% indicated that they spent more money on transport. Reasons for the increase in transport costs can be attributed to the fact that most training took place at off-campus venues.

Despite many efforts on the part of the university, three-quarters of the students felt that the protests had a negative effect on their academic performance. Although the School of Medicine continued with training, despite the closure of the rest of the university, alternative and adapted measures were put in place. All lecture material was available on Blackboard, while only some lectures were presented in person to students. Only a third of the students felt that Blackboard was a good way to catch up lectures. Internet access is needed to access Blackboard, and if students are not on campus, they need to use their data for this.

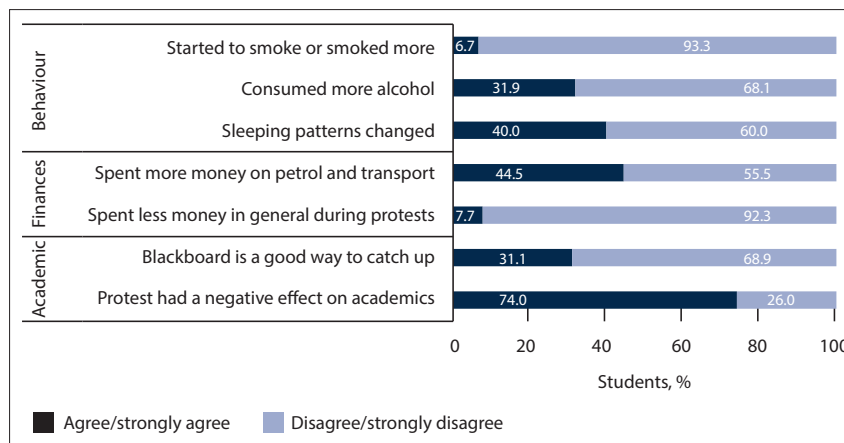


Fig. 1. The perceived effect of #FMF2016 on student behaviour, finances and academic performance.

Table 1. Students' perceptions of some aspects of #FMF2016

Student responses	%
I felt safer with additional security present	42.4
I felt unsafe during the disruption of the test	83.1
I feared for reoccurrence of #FMF in 2017	79.7
I experienced physical intimidation during test disruption	80.5
I supported the cause of #FMF	39.5
I felt pressurised to participate in protests	29.2
I partook in the protests	5.8
I felt angry towards the university for closing it	54.2
I felt that the faculty supported us well	50.8

#FMF2016 = #FeesMustFall2016.

Table 2. Mean percentage and failure percentage per year group for all modules in the end-of-year examinations

Year group	2015	2016	2017	p-value
3rd-years				
Mean (%)	64.4	63.2	64.7	0.10
Failure (%)	5.2	6.7	3.4	0.69
4th-years				
Mean (%)	67.3	68.0	67.1	0.37
Failure (%)	1.9	1.9	5.9	0.14
5th-years				
Mean (%)	68.2	67.9	69.7	0.07
Failure (%)	2.9	1.9	2.0	0.90

***Bold font** denotes the student groups directly affected by the #FeesMustFall2016 protests.

Blackboard was also used for communication with students, and more than half of the students felt that the communication was not good. Lack of internet access may have been a factor contributing to this opinion. Canadian studies also found that lack of internet access played a role in student dissatisfaction during strikes, but suggested that communication with students should be through the official communication networks of the university,^[15-18] which is currently Blackboard for UFS.

Although the protests did not have a major effect on smoking, a third of the students confessed to consuming more alcohol and 40.0% experienced changes in sleeping patterns. Both alcohol consumption and changes in sleeping patterns can have negative effects on academic performance, through the direct effect on memory, decreased motivation and less time to spend on studies.^[22-24] Behaviour changes during protests are not unique to our setting, as various studies have reported that protests contributed to behaviour changes and increases in alcohol consumption.^[15-18] Higher alcohol consumption may also contribute to increased financial expenditure.

Only half of the students felt that the faculty supported them during the protests. This phenomenon of students feeling unsupported by authorities or universities has also been found in other studies.^[16-18] Students felt stressed, with 79.7% fearing reoccurrence of protests. Despite the protests, stress levels never increased to abnormally high levels. It is difficult to compare stress levels between studies, as different measures were used to assess stress. Self-reported stress in a study at the University of KwaZulu-Natal was 78% among medical students, while a study in Pakistan reported moderate stress in 71.7% of medical students and high levels of stress in 20.8%. Both these studies were done under usual conditions.^[6,25] A study at UFS found that 46.1% of 4th-year medical students suffered from burnout, which may be an indication of high stress levels in this setting.^[26] The 2016 semester 6 students were assessed in 2015 (in semester 3) and according to the Depression Anxiety Stress Scales (DASS-21), 35.0% of them screened positive for stress.^[27]

Using a validated PTSD screening tool,^[21] 12.7% of the 120 students screened positive for PTSD after the test disruption. This is much higher than the global figures of 7.8 - 9.2% found in similar populations exposed to a traumatic event.^[28]

No negative effect of the protests could be demonstrated from the student marks, although 74.0% of students felt that the protests had a negative effect on academic performance. A negative effect on academic performance has been reported in other studies, but all were self-reported views.^[15-18] Stress does not necessarily affect cognition negatively, and academic performance may even improve with moderate added stress.^[9,29]

Although #FMF2016 did not have a negative effect on academic performance, PTSD and increased alcohol consumption may have

long-term effects on individuals in this already stressful environment.

Study limitations

The data collection on student perceptions of #FMF2016 only took place during 2017, as the students left for their holiday after the examination, and the study could only be conducted after ethical approval and granting of permission by the authorities.

Conclusions

From the data collected and interpretation thereof, it was possible to report on the perceived and real effect of #FMF2016 on clinical medical students at UFS. These results may also be generalisable to other medical faculties, as their students experience the same study and environmental stress. The negative coping mechanisms displayed in this study may assist medical faculties to prepare students for additional stress and equip them to cope with it. Contingency plans to communicate effectively with students and staff during unforeseen student unrest need to be in place and tested.

Reported negative behaviour changes occurred, with 31.9% of students reporting increased alcohol consumption and 40.0% reporting changes in sleep patterns. Both these factors may have a negative effect on academic performance, although it was not demonstrated.

The financial burden on the students increased, with transport a major contributor and relocation to off-campus accommodation another possible factor. This extra expense placed additional stress on the already financially strained students.

Only half of the students felt that the university supported them sufficiently and that communication was adequate, despite regular updates on Blackboard, the official communication medium for the students.

The general stress levels of the students were not abnormally high, but 79.7% feared reoccurrence of the protests. Alarming, however, 12.7% of students screened positive for PTSD after the violent test disruption.

Although 74.0% of students claimed poorer academic performance due to the protests, this could not be proved by comparing examination results with those of students not affected by protests.

Recommendations

- Owing to the lack of local data, a study to determine the general stress levels of medical students, as well as PTSD, in our study population will be valuable.
- The high prevalence of PTSD in our study population warranted the subsequent appointment of a clinical psychologist and a social worker to assist medical students in coping.

- Feedback of the results should be made available to the faculty and university authorities.
- Recommendations from this and other studies are to improve communication during protests and to keep students informed via official university networks. Attention should be paid to improving internet access from off-campus sites.

Declaration. None.

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Author contributions. HB was the study leader who suggested the topic, supervised the students through phase 1 of the project process, and wrote the protocol for phase 2. GJ advised with the planning of the study, performed the analysis, assisted with the write-up of the manuscript, and was actively involved with the planning of phase 2. LL, PD, GM, MM, PM and DT, who were 2nd-year medical students at the time of the study, compiled the protocol for phase 1, performed the data collection and wrote the first draft report.

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