

Medical Students' Perception of the Educational Environment at Al-Nahda College by using DREEM inventory

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Abstract

Background: Educational environment encompasses everything that are found and occurs inside the school of Medicine. It affects the students' ability to achieve their academic goals, feeling of academic satisfaction and well-being. Assessment of the educational environment of paramount-importance for all stake-holder, administrators and educators in the academic field. The aim of this study to measure the student perception towards the educational environment in Al-Nahda college.

Methods: This is an institutional based cross-sectional study conducted in Al-Nahda College between January and February 2018. Study population were 634 medical students. Dundee Ready Education Environment Measure (DREEM) questionnaire was used as a survey tool for this study. Students' responses were entered to the computer and analyzed by using Statistical Package for Social Sciences (SPSS) version 24 (SPSS Inc. Chicago, IL, USA).

Results: A (83.9%) pre-clinical and (16.1%) clinical stage participated in this study from all academic levels. Three hundred and sixty (56.9%) were male students, while the rest were female (43.1%). The overall mean (SD) DREEM score in this study is 130 (34.2), which indicates more positive educational environment than negative. Likewise, students' perception for teachers, Students' academic self-perception, Students' perception of atmosphere and Students' social self-perception. However, students' perception for learning shows negative indicator. Students' female gender have significantly higher mean (SD) overall DREEM score than male students [136 (31.5) Vs. 129 (35.5); $P= 0.008$], respectively. Female scored higher than male in subclass students' perception for teachers, Students' academic self-perception and Students' social self-perception, [28.8 (7.8) Vs. 27.1 (8.5); $P= 0.024$]; [22.2 (5.6) Vs. 21.0 (7.2); $P= 0.017$]; [19.8 (4.9) Vs. 18.8 (5.4); $P= 0.019$], respectively.

Conclusions: The educational environment is perceived positive in Al-Nahda College. Four out of five inventory subscale were perceived positive, while only students' perception of learning sub-scale was perceived negative. Female students and non-Sudanese students perceived the educational environment better than the male students and Sudanese students. The perception of clinical students did not differ from that of pre-clinical students.

Background

Evaluation process is one of the cornerstones of the educational management. Which is best defined as a periodic process that assess the overall academic work. (1) The educational environment is a complex term that refers to the social, psychological, various physical locations where the students learn. (2-4) In addition to the infra-structure, and University settings, it encompasses the attitude of teachers inside the class and the methods they used to deliver the learning materials to the students. Also, it involves the type of curriculum and the methods of teaching used to deliver the curriculum. Collectively, the educational environment can be defined as everything that affect the learning process whether directly or indirectly. (5) Therefore, the World Federation for Medical Education (WFME) emphasized on the learning environment as one of the 20 targets that should be considered in medical school evaluation during accreditation process. (6)

It is widely accepted that evaluation of the learning environment in the medical school is one of the major components of the medical school appraisal program. (7) It is postulated that learning environment affects the ability of the students to learn. (8) Thus, identification of factor(s) that hinders students' academic performance of paramount importance for institutes' directors. (9) To measure the learning environment in a scientific way a sensitive and reliable assessment tool is needed, that is able to express and represent the data in a quantitative way.

In 1997, Dundee's University team presents an assessment tool that able to measure the environment and the atmosphere of education in a medical school. It is named Dundee Ready Educational Environment Measure (DREEM). This tool is accepted worldwide as a reliable and valid assessment tool to measure the environment of the medical school. This universal consensus attributed to its method of development. Briefly, it includes involvement of Grounded theory and Delphi procedure methods on almost 100 medical educators around the world. Secondly, it is used in over 1000 medical students internationally. Thirdly, it combines quantitative and qualitative methods that considered the multi-national and multi-cultural environment which is not biased to specific community. (10,11)

Al-Nahda College, is a private college that is established and received the first batch in 2013. The curriculum used in the college is modified integrated curriculum. Although the college is about to

graduate its second batch in the medicine program no study conducted and documented the level of the educational environment in it. Bearing in mind, the upcoming worldwide medical school accreditation program by 2023 and needed quality in education, it is apparently clear that evaluation of the educational environment is an inevitable issue. Such study can be considered as a college self-study that is a pre-requisite to the college accreditation by the Sudanese Medical Council. Therefore, this study is conducted to provide a basic information about the perception of the medical students about the educational environment.

Methods

This is an institutional base cross-sectional study. It is conducted in Al-Nahda University College between January and February 2018. Al-Nahda University College is a private college that was established in 2013 and so far, has 2 graduated batch from the Medicine and Surgery program. The college composed of 8 academic programs, namely; Medicine and surgery, Dentistry, Pharmacy, Medical Laboratory, Nursing, Information Technology, Administrative Sciences and Linguistics. Study population were Medical students in all academic levels (1st year- 5th year). Al-Nahda University College use an integrated curriculum that is operated by using both longitudinal and block modules. At the end it provides the graduate with Bachelor of medicine and Bachelor of surgery (MBBS) in 5 academic years. In the first 3 years the curriculum delivered systems courses that emphasize on basic sciences with some clinical background. Pure clinical teaching applied at the last 2 years. The total number of students in the Medicine and Surgery Program is 874 students. We use the total coverage approach in sampling and try to collect the responses of majority of the students therefore we successfully approached 670 students and 36 refuse to participate. The study was explained to the all students by one of the investigators who received training on data collections and communications with the students for 1 day. The investigator approached the students to participate in the study at the class after one lecture. Those who agreed to participate were asked to fill the questionnaire without write their names. The questionnaire language was English language and it was not a problem as the media of teaching is English language. The investigators add some demographics data that includes student's age, gender, academic level and nationality.

The study data collected by using Dundee Ready Measure for Educational Environment (DREEM) questionnaire, which is composed of 50 questions each scored by 0-4 at five-point Likert scale (strongly agree= 4, agree = 3, uncertain = 2, disagree = 1, strongly disagree = 0). However, there are 9 questions (numbers 4, 8, 9, 17, 25, 35, 39, 48, and 50) were negative and their scoring is inverted. The maximum score of the overall scale is 200. The interpretation of the overall score as the following: 0-50 indicates very poor educational environment, 51-100 indicates many problems, 101-150 more positive than negative and 151-200 as excellent educational environment. The scale contains 5 subclasses that detailed as the following;

I. Students' perception of learning:

This domain contains 12 questions with maximum score of 48. The scores interpreted as the following: 0-12, 13-24, and 25-36 were interpreted as very poor, negative, and a more positive approach, respectively.

II. Students' perception of teachers:

This domain contains 11 questions with maximum score of 44. The scores interpreted as the following: 0-11, 12-22, 23-33, and 34-44 were considered as abysmal, in need of some retraining, moving in the right direction, and model teachers, respectively.

III. Students' academic self-perception:

This domain contains 8 questions with maximum score of 32. The scores interpreted as the following: 0-8, 9-16, 17-24, and 25-32 were interpreted as a feeling of total failure, many negative aspects, feeling more on the positive side, and confident, respectively.

IV. Students' perception of atmosphere:

This domain contains 12 question with maximum score of 48. The score interpreted as the following: 0-12, 13-24, 25-36, and 37-48 were considered as a terrible environment, there were many issues that need to change, a more positive atmosphere, and a good feeling overall, respectively.

V. Students' social-self perception

This domain contains 7 questions with maximum scores of 28. The score interpreted as the following:

0-7, 8-14, 15-21, and 22-28 were considered as miserable, not a nice place, not too bad, and very good socially, respectively.

Also, every single item can be judged as areas that need particular attention, area that can be improved and strong areas at score ≤ 2.0 , 2-3 and ≥ 3.5 , respectively.

Statistical analysis

The data were entered to computer and double checked and analyzed by using Statistical Package for Social Sciences (SPSS) (version 24; SPSS Inc. Chicago, IL, USA). The data were expressed as mean (SD) or number (%). Students' gender, academic level and nationality were used as dependent variables. The mean (SD) of DREEM overall score and subclass score were compared by using student *t*-test after checking the variance. *P*-value ≤ 0.05 considered statistically significant.

Results

A total of 634 medical students participated in the study from all academic levels including (83.9%) pre-clinical and (16.1%) clinical stage. Three hundred and sixty-one (56.9%) were male students, while the rest were female. There were five nationalities participated in this study namely; Sudanese, Nigerian, South African, Syrian, and Egyptian. Sudanese nationality was the most common nationality (71.9%) among the participant, while the Nigerian (18.1%) was the most common nationality among the foreign nationalities and Egyptian was the least one (1.3%), Fig. 1, Table 1.

Table 1
Background charecteristics of the study population

Variable	N (%) Or Mean (SD)
Age, years	19.6 (1.5)
Gender	361 (57.0)
Male	273 (43.0)
Female	
Academic level	129 (20.3)
1st year	260 (41.0)
2nd year	143 (22.6)
3rd year	80 (12.6)
4th year	22 (3.2)
5th year	
Nationality	456 (71.9)
Sudanese	115 (18.1)
Nigerian	46 (7.3)
South African	9 (1.4)
Syrian	8 (1.3)
Egyptian	

The overall DREEM score in this study is 130, which indicates more positive educational environment

than negative. Likewise, students' perception for teachers, Students' academic self-perception, Students' perception of atmosphere and Students' social self-perception. However, students' perception for learning shows negative indicator, Table 2.

Table 2
DREEM overall score and subclass score among Al-Nahda Medical Students

Domain	Number of items	Maximum score	Al-Nahda College findings Mean (SD)	Rating
DREEM overall	50	200	130 (34.2)	More positive than negative
Students' perception for learning	12	48	24 (6.0)	Negative
Students' perception for teachers	11	44	28 (8.3)	Moving in the right direction
Students' academic self-perception	8	32	21.5 (6.6)	More positive
Students' perception of atmosphere	12	48	32.7 (8.3)	More positive atmosphere
Students' social self-perception	7	28	19.2 (5.2)	Not too bad

Students' female gender have significantly higher mean (SD) overall DREEM score than male students [136 (31.5) Vs. 129 (35.5); $P = 0.008$], respectively. Also, female scored higher than male in subclass students' perception for teachers, Students' academic self-perception and Students' social self-perception, [28.8 (7.8) Vs. 27.1 (8.5); $P = 0.024$]; [22.2 (5.6) Vs. 21.0 (7.2); $P = 0.017$]; [19.8 (4.9) Vs. 18.8 (5.4); $P = 0.019$], respectively. Academic levels didn't show any significant effects in the perception of the students towards the overall DREEM score or the subclass, Table 3.

Table 3
Determinant of students' perception according to DREEM overall and sub-class

Variables	DREEM overall score	Students' perception for learning	Students' perception for teachers	Students' academic self-perception	Students' perception of atmosphere	Students' social self-perception
Gender	129 (35.5)	23.7 (6.1)	27.1 (8.5)	21.0 (7.2)	32.5 (8.7)	18.8 (5.4)
Male	136 (31.5)	24.5 (5.8)	28.8 (7.8)	22.2 (5.6)	33.07 (7.7)	19.8 (4.9)
Female	0.008	0.082	0.024	0.017	0.407	0.019
P-value						
Academic level	132.0 (33.3)	24.0 (6.0)	27.7 (8.1)	21.5 (6.5)	32.6 (8.1)	19.1 (5.2)
Pre-clinical	132.8 (38.3)	24.3 (6.1)	28.2 (9.0)	21.5 (7.3)	33.0 (9.3)	19.5 (5.3)
Clinical	0.946	0.780	0.821	0.922	0.954	0.658
P-value						

None of the detailed item scored less than 2 or more than 3, Table 4.

Table 4
Detailed item scores for educational environment of medical school in Al-Nahda College

Item	Statement	N	Mean (SD)
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	Students' perception of Learning		
1.	I am encouraged to participate during teaching sessions.	634	2.08 (1.59)
2.	The teaching is often stimulating	634	3.20 (0.663)
3.	The teaching is students centered	634	3.05 (1.169)
4.	The teaching helps to develop my competence	634	2.97 (1.138)
5.	The teaching is well focused	634	2.56 (1.170)
6.	The teaching time is put to good use	634	2.59 (1.104)
7.	The teaching over emphasizes factual learning	634	2.89 (1.086)
8.	The teaching helps to develop my confidence	634	2.65 (1.041)
9.	I am clear about the learning objectives of the course	634	2.19 (1.363)
10.	The teaching encourages me to be an active learner	634	2.59 (1.180)
11.	Long term learning is emphasized over short term learning	634	2.37 (1.166)
12.	The teaching is too teacher centered	634	2.59 (0.981)
13.	Students' perception of teachers		
14.	The course teachers are knowledgeable.	634	2.27 (1.36)
15.	The teachers are patient with patients/ students' consultations	634	2.93 (0.860)
16.	The teachers ridicule the students	634	2.92 (1.065)
17.	The teachers are authoritarian	634	2.98 (1.156)
18.	The teachers have good communication skills with patients	634	2.47 (1.220)
19.	The teachers are good at providing feedback to students	634	2.69 (1.329)
20.	The course teachers provide constructive criticism here	634	2.59 (1.269)
21.	The teachers give clear examples	634	2.30 (1.372)
22.	The teachers get angry in teaching sessions	634	2.10 (1.332)
23.	The teachers are well prepared for their teaching sessions	634	2.18 (1.408)
24.	The students irritate the course teachers	634	2.65 (1.220)
25.	Students' academic self-perception		
26.	Learning strategies which worked for me before, continue to work for me now.	634	2.95 (1.120)
27.	I am confident about my passing this year	634	2.85 (1.192)
28.	I feel I am being well prepared for my profession	634	2.92 (0.875)
29.	Last years work has been a good preparation for this years work	634	2.71 (1.369)

30.	I am able to memorize all I need	634	2.44 (1.323)
31.	I have learnt a lot about empathy in my profession	634	2.66 (1.325)
32.	My problem-solving skills are being well developed here	599	2.48 (1.128)
33.	Much of what I have to learn seems relevant to a career in healthcare	634	2.65 (1.031)
34.	Students' perception of atmosphere		
35.	The atmosphere is relaxed during teaching	634	2.95 (0.961)
36.	The school is well timetabled	634	2.82 (1.117)
37.	Cheating is a problem in this school	634	2.76 (1.194)
38.	The atmosphere is relaxed during lectures/clinical rounds	634	2.59 (1.158)
39.	There are opportunities for me to develop interpersonal skills	634	2.92 (1.160)
40.	I feel comfortable in teaching sessions socially	634	2.72 (1.084)
41.	The atmosphere is relaxed during seminars / tutorials	634	2.85 (0.989)
42.	I find the experience disappointing	634	3.11 (1.056)
43.	I am able to concentrate well	634	2.44 (1.261)
44.	The enjoyment outweighs the stress of the course	634	2.65 (1.220)
45.	The atmosphere motivates me as a learner	634	2.35 (1.149)
46.	I feel able to ask the questions I want	634	2.79 (0.937)
47.	Students' social-self-perception		
48.	There is a good support system for students who get stressed.	634	2.57 (1.183)
49.	I am too tired to enjoy the course.	634	2.53 (1.259)
50.	I am rarely bored on this semester	634	2.89 (1.108)
51.	I have good friends on this school	634	3.04 (1.065)
52.	My social life is good	634	2.60 (0.898)
53.	I seldom feel lonely	634	2.92 (1.164)
54.	My accommodation is pleasant	634	2.72 (0.959)

Discussion

For the best of our knowledge, this is the first DREEM study reported from a private Medical college in Sudan. The major finding of this study is that, the overall DREEM score is 130/200 and indicates a more positive than negative educational environment in Al-Nahda Medicine Program. This result in-line with Ahmed et al., and Salih et al., who conducted their studies in public Sudanese national university, namely the University of Gezira and Bahri University who scored 122/200 and 125.2/200,

respectively (12,13). Such relatively good result pointed to the well-established infra-structure, integrated and students' centered curriculum, skill-full teachers and the good social-environment of Al-Nahda college which is been adopted since its establishment. In the same manner, this result is comparable to other international Universities like, Management and Science University, Shah Alam in Malaysia 125.3/200, Ziauddin University in Pakistan 117/200, King Abdul Aziz University 102/200, Taibah University 120/200 and Qassim University in Saudi Arabia 112/200. (14-18) On the other hand, our score is far better than some Universities who scored lower than our score like, Jazan University 96.5/200, King Saud University in Saudi Arabia 90/200, and Guilan Medical University in Iran 100/200, and their scores indicate an educational environment with many problems. (19-21) These three institutes were founded in an economically powerful country with ample logistics and resources. However, their students perceive a negative educational environment. Perhaps, not only the economical-power is the determinant of the educational environment and it seems there are other factors beyond the facilities in the educational environment. (19) DREEM inventory is used to measure the educational environment and it is accepted internationally to compare the educational environment for different medical school around the world. Keep in mind, DREEM considered the inter-nations differences in culture, moral issues and languages. The ability of the DREEM for international comparison, attributed to its psychometrics properties mainly the validity and reliability (22).

The subscales showed a more positive than negative environment for 4/5 subscales, namely; students' perception for teachers, students' academic self-perception, students' perception for atmosphere and students' social self-perception. However, students' perception for learning indicates a negative perception. We though, good perception for teachers is outcome of a Faculty continuous development plan that implemented by the Educational Development Centre and aimed to enhance the faculties capacities in the area of preparation and delivery of the teaching materials, setup of a blue-printing, standard settings and student assessment. Moreover, the college follows a specific a rigorous recruitment procedure that ensure selection of those who have the highest academic grades and have a good academic teaching experience. This finding is in line with other universities form

Sudan and outside Sudan as well (12,23). Although both female and male perceived their teachers positively, female students significantly perceived the teachers more positively than male students. There is no clear reason for this, however, it may be attributed to the way of thinking, learning style, concern and interest of the female gender over male gender. (24) From another point of view, Makhdoom and his colleagues observed that, high academic achievers perceived their teachers far better than non-academic achievers. Perhaps, the female students in our study among higher academic achievers. Our result 28/44 coincides with other findings reported from two institutes in Saudi Arabia 26.6/44, 25/44 and Malaysia 27.4/44. (18,25,26)

Students' academic-self-perception is perceived positively in our study with score of 21.5/32. Academic self-perception is defined by Kohli and Dhaliwal who stated that "academic self-perception is related to ability of the students' to cope with the academic workload". (27) Although studies reported low score and negative perception in this domain, which indicate a global defect (28,29), our result is similar to that reported by other studies from Sudan 21/32 and Malaysia 20.6/32. (12,15)

Well designed and prepared time-table with more self-directed learning allocated time is a leading cause for this positive perception. However, delivery of a lot of teaching activities in a very restricted time considered challenging issue in medical education. Whether the teaching curriculum is traditional or innovative. (28,29) Students feel overloaded by academic duties and this overwhelming sensation may end-up with students' frustration and sometimes depression. (30) Again, female students perceived the academic-self-perception significantly more positively than male, Australian DREEM supports our finding (31). It worth mentioning that, female medical students were described by Carol Gilligan and Susan Pollak (1988) more than 3 decades ago by that "The increasing number of women entering the medical profession prompts a rethinking of medical education. Like the canaries taken into mines to reveal the presence of unseen dangers, women medical students in their heightened sensitivity to detachment and isolation often reveal the places in medical training and practice where human connection has become dangerously thin". (32) Perhaps, this high female sensitivity leading to such differences in the perception of atmosphere and other domains.

Students' perception for the atmosphere in our study scored 32.7/48 showed a more positive

perception like other DREEMS report from Sudan 26/48 and Saudi Arabia 30.2/48 (12,17). Educational atmosphere is referred to the teaching class and clinics setup, the teachers' behaviour during the teaching sessions and clinical rounds. Also, it includes the curriculum design and academic regulation. Some reports indicate that teacher centred curriculum that is focused in lecturing is boring (33,34). Therefore, the students will be subjected to less motivating environment in contrast to problem-based learning (35). There is neither gender nor academic ranking differences in the perception of this domain.

In this study the students' perceived the social life more-positive (19.2/28) as so many institutes from Sudan 17/28, Pakistan 15.4/28 and Malaysia 16.7/28 (12,15,16). The finding of good social life in this study is not astonishing as it is partially attributed to the out-class activities and journeys in addition to the open cultural days that regularly organized by the students' deanship. These journeys and open days robust the social relationship of the students with each other's and with the academic and administrative staff as well. Moreover, students' mentoring program is one of the important determinants of the social life, which provides a good psychological support and feedback system. (36) Although, there is no well-known mentoring program, there a students' academic supervision program that implemented in last two years and its aims are very close to those of mentoring program. Female students perceived the social life significantly more positively than male students as seen in College of Medicine -Taibah University. (18)

Students' perceptions of learning which indicate a negative educational environment. This is a major concern for many international Universities. (28,36-39) To obtain a good learning perception, researchers recommend structured learning for clinical and theoretical teaching. Moreover, allocate more time for tutorial sessions, adopt small teaching group techniques and usage of different teaching techniques (40). Although there is no item that scored below 2 in this subscale, however, items that scored the worst are; "I am clear about the learning objectives of the course" and "I am encouraged to participate during teaching session". Clarity of the learning objectives is a cornerstone of the adult learning principle and participation in the discussion reflect students' cognitive activity (41). No doubt this subscale needs an urgent intervention that includes; ensure explaining of the

learning objectives to the students for each teaching session or at least for every module. Increase the small group discussion with encouraging each student to participate in the session. On long term planning, this domain should be considered at the time of curriculum appraisal.

This is the first study that document the educational environment in Al-Nahda College that contains many limitations. Firstly; although DREEM inventory is well structured, validated and reliable. However, it is long that students feel boring while answering the items. Secondly; we didn't inquiry about the students' academic achievement to allow us know how the high and under achievers perceive the educational environment in the college. Thirdly, we didn't inquiry about students' entry score to the college to follow them up and correlate their entry score to the college with their academic performance and overall DREEM score. Therefore, further study is needed to reassess the educational environment in Al-Nahda College after considering all the domains that need intervention and the variables that are missing in this version.

Conclusions

The overall DREEM score indicates that the educational environment perceived positive by the Medical students. Four subscales perceived positive and these are; students' perception of teachers, students' academic self-perception, students' perception of atmosphere and students' social self-perception. The students' perception of learning perceived negative by the students. Female students perceived the educational environment significantly far better than male students. The perception of clinical students not differed from that perceived by pre-clinical students. Further study is needed.

List Of Abbreviations

DREEM	Dundee Ready Educational Environment Measurement
IL	Illinois
Inc	Incorporation
MBBS	Bachelor of Medicine and Bachelor of surgery
SASP	Students' academic self-perception
SD	Standard deviation
SPA	Students' perception of atmosphere

SPL	Students' perception of learning
SPSS	Statistical package for social sciences
SPT	Students' perception of teachers
SSSP	Students' social self-perception
UK	United Kingdom
USA	United states of America
WFME	World Federation for Medical Education

Declarations

Ethics approvals and consent to participate

The study received ethical clearance from AL-Neelain University Research Ethics committee. All participants provide written informed consent.

Consent for publication

Not applicable

Availability of data and materials

Authors confirm that they are ready to provide the study data and materials upon request.

Competing interests

None to declare.

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Not applicable.

Authors' contributions

HZH and NMA concepted and designed the study. MYI, RHM and LHA conducted the study. YMA, HZH and NMA shared in the statistical analyses. NMA, HZH and YMA share in drafting the paper. All of the authors drafted and approved this version of the paper.

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Figures

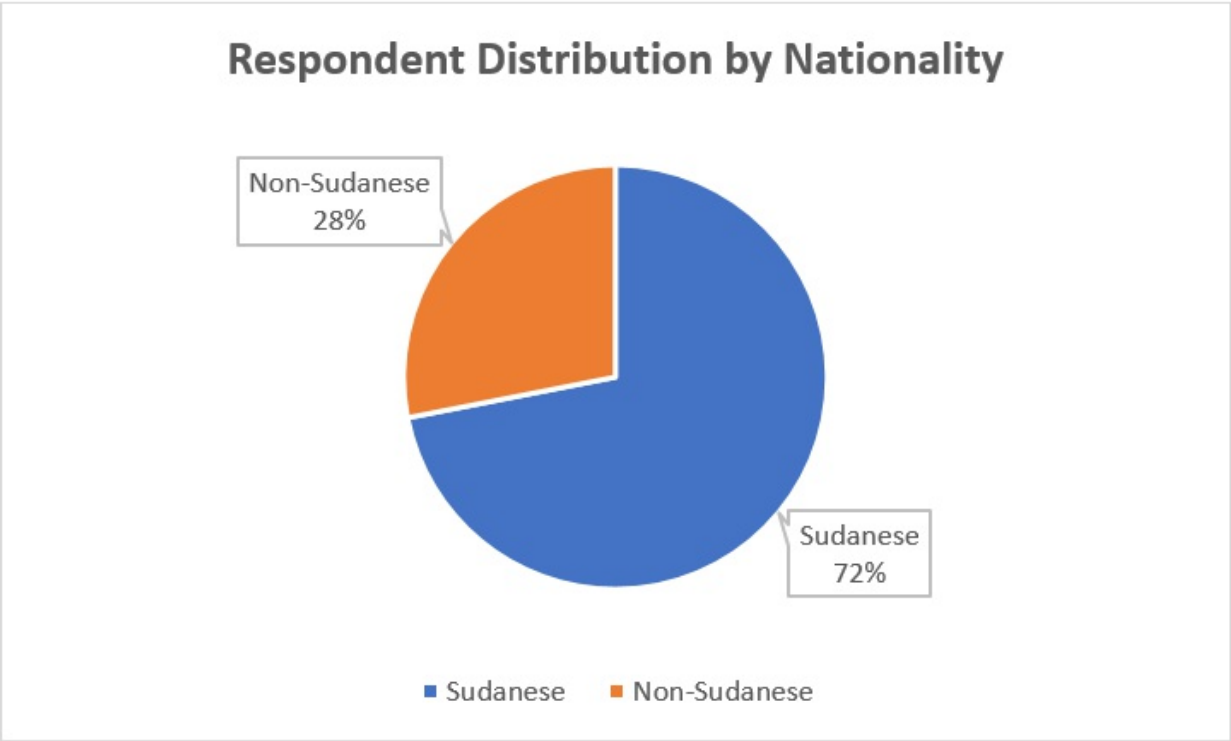


Figure 1

Respondent Distribution by Nationality Pie-chart showed the distribution of respondent according to their nationalities.

Supplementary Files

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