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The Impact of the Faculty of Medicine, University of Gezira, Innovative Programme on its Graduates

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Abstract:

Introduction: Programme evaluation is the collection and interpretation, through systemic and formal means, of relevant information which serves as a basis for rational judgment in decision situations. This study was conducted as part of the third programme development of the Faculty of Medicine, Gezira University 2010 – 2011.

Objectives: The general objective is to study the impact of the Faculty of Medicine, Gezira University, innovative programme, on its graduates. The specific objectives include the evaluation of graduates' competences in the three main areas of domain of learning, i.e. Knowledge, skills and attitude.

Materials and Methods: This is a Cross-sectional Study conducted in the period from13th. of January to 12th. of February 2011. The study population includes *146* consultants who have Gezira graduates training with them including house officers, medical officers and registrars. Excluded from the study all consultants who are academic staff members in the FMUG, who are Gezira graduates or who are involved in student training. A questionnaire was designed to answer the questions that address the objectives of the study covered in 32 questions, using a grading scales; 1 to 5: where 1= poor; 2= less than average, 3= average; 4= good; 5= excellent.

Results: the response rate for the questionnaire was 73% (146/210), representing 146 consultants working in 23 hospitals in 12 cities. In the overall evaluation of graduates´ knowledge and cognitive abilities, graduates were rated as good to excellent in (68.3%), average in (25.12%) and poor to below average in only a minority of the graduates. In the overall evaluation of graduates´ skills and competences, graduates were rated as good to excellent in (72.33%), average in (20.81%) and poor to below average in only a minority of the graduates. In the overall evaluation of attitudes and ethical standards, graduates were rated as good to excellent in the majority (84.06%). In the overall classification, graduates were rated as good to excellent in the vast majority (82.6%), average in the minority (14.5%) and poor to below average in only a few cases.

Conclusion The evaluation of graduates' competences is an important element in the educational programme evaluation. These results provide evidence in favour for the innovative educational programme and can encourage other medical schools to adopt it. Further studies are needed to cover other aspects of graduates' evaluations.

Key words: Faculty of Medicine,University of Gezira (FMUG), Gezira innovative programme, graduates, impact

1. Introduction:

1.1. History and background: The Faculty of Medicine,University of Gezira (FMUG) was Establishment in 1975 after a presidential decree and the first batch of students was enrolled in 1978. The mission of the FMUG states its commitment to develop its community through improvement and sustainment of health. The general objective of the school is to graduate a highly qualified medical practitioner, who provides health services in the community and conduct relevant research. The specific objectives of the FMUG cover

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the three aspects of education, research and service. The broad competencies required of students at graduation include: (i) Knowledge of Basic Sciences, Clinical Sciences, Community and Behavioural Sciences; (ii) Skills: clinical skills, community diagnoses skills and research skills; (iii) Attitudes: respect of patients' culture and values, demonstrating sympathy and concern about patients' problems, conforming to the code of medical ethics and (iv) the ability to continue learning after graduation. [1]

FMUG has strong partnerships with Ministry of Health and the community. They work in harmony to achieve the concept towards unity for health (*TUFH*), through health professionals' education, service and research. The school is a pioneer in COME in the EMRO region. It has accumulated a paramount of experience in curriculum development, innovation and evaluation. It is the leader of innovative medical education in the Sudan. It has influenced many of the faculties in Sudan; About 13 new faculties adopted the Gezira innovative programme. It has strong links with national and international educational institutes. The faculty staffs participate in teaching and evaluation of undergraduate and postgraduate students in all faculties of health sciences in the country. The FMUG is a member of Sudan Medical Council and Sudan National Council for Medical Specialties

FMUG has adopted the following ***strategies*** to achieve its objectives: (1) Student-centered teaching methods; (2) Community oriented and community based education; (3) Problem-based learning; (4) Integration of basic, clinical, and socio - behavioral sciences; (5) Early exposure of students to clinical and community training and training of students in the existing health facilities where the graduates will work after graduation; (5) Team work and (6) Staff development. [1, 2]

1.2. The curriculum of the FMUG has Characteristic features. The curriculum is well documented and every module has written justifications, objectives, contents, teaching strategies and evaluation methods. Community based modules constitute about 20% of the total credit hours. Basic sciences, clinical sciences are integrated together with the social and behavioural sciences. The curriculum is implemented in the form of blocks and is divided into three phases. Phase I (semester I, II and III): the basic biological functions, growth and development; the normal human behaviour; nutrition, the effect of the internal and external environment and introduction to the abnormal changes in the human body. Phase II: (semesters III to VII); Integrated modules of the organ system of the body and certain themes. Phase III: (semesters VIII to X); the clerkship phase. [3, 4]

1.3. Students and graduates: **There are usually five batches at one time and 230 students in each batch. The FMUG offers scholarship to neighbouring African and Arab countries and also a good number of foreign students are enrolled on private basis. Students have an active role in the educational process. Twenty eight (28) batches were graduated so far. The number of graduates was amounting to 4000 doctors (up to batch 28) working in the Sudan and abroad.**

Many of the graduates are now staff members in the faculty. [5]

1.4. Programme evaluation of medical curricula: A programme may be defined as "any unified set of services provided in order to accomplish a certain group of related goals" [6] or more inclusive as "a set of resources and activities directed towards one or more common goals" [7] .What programmes have in common is a set of objectives and a target population. [8]**.** Evaluation may be defined as "the collection and interpretation, through systemic and formal means, of relevant information which serves as a basis for rational judgment in decision situations" or "the process of describing an evaluand and judging its merits

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and worth" [9, 10]

Programme evaluation is the process of systematic data collection, analysis and interpretation for the purpose of showing the value of a particular educational programme. More specifically, educational evaluation is a careful, rigorous examination of an educational curriculum, programme, institution, organisation variables, or policy. [11]

*1.5. The evaluations studies of the community-based, community-oriented innovative programs***:** In the last quarter of the last century, a great part of attention and concern of medical educators was focused on improving the community aspects of medical education [12] and evolving of new concepts in this field [13]. A community-oriented medical education network has been formed [14], Gezira medical school has been one of the pioneers since the network establishment, the results of which have been praised [15]. There are still questions about the superiority of this type of education and how community-oriented most of these institutions really are. Thus, there is still a need for assessment and evaluation of these programs and their outcomes**.**

Many studies showed that performance of graduates of community-oriented curricula in the knowledge domain is comparable to the performance of those of more conventional training programs. With respect to humanistic values, communication with patients, and clinical skills, graduates from the innovative programs are superior to graduates from traditional schools. These findings are consistent with those of a similar review. [16]

1.6. The Gezira experience: The Faculty of Medicine, University of Gezira, is the leading community-oriented, community-based medical school in the Sudan. The school evaluated the performance of the first two groups of graduates as part of a comprehensive evaluation of the program [17]. The main objective of the evaluation study was to assess Gezira graduates clinical and professional performance during the housemanship period, i.e., immediately after graduation. A questionnaire was used and administered to consultants with whom graduates worked as house-officers during clinical rotation, including general medicine, surgery, obstetrics and gynaecology and paediatrics. Consultants who had participated actively in the undergraduate training of these graduates were excluded. The questionnaire contained questions on three main areas; (1) cognitive aspects, (2) psychomotor domain and clinical skills and (3) attitudes, communication skills and ethics. Graduates were also compared with graduates from other Sudanese medical schools. Results showed that the overall mean ratings on a five-point scale were 4.1, 3.9 and 4.2 for cognitive, clinical skills and attitudes respectively. The graduates were found to be better than (45%), comparable to (50%) and less than (5%) other graduates who worked with the same consultants in the past. [14]

2. The objectives of the study:

2.1 General Objective: is to study the impact of the programme of the Faculty of Medicine, Gezira University – Sudan, on its graduates.

2.2 Specific Objectives: of this study included evaluation of the impact in the three main areas of domain of learning, as follows:

First; to study the impact of the **knowledge** domain of the curriculum on the graduates: this covers knowledge and intellectual processes which range from recall of facts up to the rational use of these facts in solving patient problems including: (a) common and endemic diseases, (b) basic sciences, (c) clinical

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sciences**,** (d) essential drug, (e) social, economic and cultural factors related to disease and its causation, management and prevention, (f) requesting appropriate investigations when needed and (g) interpreting laboratory results and images investigations.

Second; to study the impact of the **skills** domain of the curriculum on the graduates: actual translation of knowledge into practice & the capability to perform clinical skills confidently and competently, including: (a) taking a thorough medical history, (b) conduction proper and systemic bedside examination and eliciting important signs, (c) performing diagnostic procedures, (d) performing basic skills procedures, (e) performing therapeutic intervention processes and (f) giving emergency management.

Third; to study the impact of the **attitude** domain of the curriculum on the graduates

this includes: (a) concern, respect and empathy towards patients and their families, (b) work and maintain good relations with medical colleagues, (c) work in team and harmony with other health professionals, (d) concern and taking the responsibility of teaching auxiliary staff, (e) attendance and punctuality, (f) committment and dedication. (g) general appearance, (h) ability to express ideas clearly and fluently, (i) understanding and respecting hospital regulations and administrative matters, (j) ability to keep good patients records and follow up sheets, (k) decision making abilities, (l) problem solving abilities, (m) possession of good counselling skills and (n) the overall moral and ethical standards.

3. Justifications of the study:

3.1. The Gezira experience is now over thirty years and twenty eight batches have been graduated. The school graduates are working nationally, regionally and internationally.

3.2. The FMUG conducted a performance assessment of its graduates twice as a part of the school programme evaluation. In spite of the expansion of the Gezira experience, evident by the increasing numbers of innovative medical schools in Sudan, no similar studies have been done in the country.

3.3. The school experience has been expanded and applied in many medical curriculae in the Sudan. This is a clear evidence that the FMUG has influenced medical education in Sudan by disseminating its innovative experience to many schools.

3.4. Evaluation of graduates is an essential component of programme evaluation particularly the impact or outcome. This is a part of the school self evaluation that has been carried out regularly every ten years, yet is lacking enough documentations.

3.5. This study will provide evidence for this innovative programme and will help other schools to be convinced and encouraged to adopt this approach.

4. Material and methods:

Study type: This is a Cross-sectional Study conducted in the period from 13[th.] of January to 12[th.] of February 2011. **Study area included** 23 Teaching hospitals in 12 cities in the country. The **study population** included consultants who were working in different Teaching hospitals at the time of the study**,** who had Gezira graduates training with them including house officers, medical officers and registrars **(327).** **Excluded** from the study all consultants who are academic staff members in the FMUG, are Gezira School graduates, are actively involved in student training or consultants who have no Gezira graduates working with them at the time of the study. The **sample size** is all consultants available, by simple random technique,

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according to inclusion criteria (number was 146 = 44.65% of population). Questionnaires were distributed randomly to all possible and available consultants**.** The questionnaire designed to answer the questions that addressed the objectives of the study, constituted of 32 questions covering the three domains; knowledge, skills and attitude. The Grading (Likent´s) scale was used as follows: 1= poor; 2= less than average, 3= average; 4= good; 5= excellent. Data was managemed and analysed using special computer programme (SPSS) and aid of a specialist statician. **Study limitations** were difficulties in distribution and collection of the questionnaires due large number of consultants included, wide study area including 23 hospitals in 12 cities, reluctance response, unavailability and limitations related to communications.

5. Results:

Two hundred questionnaires were distributed to consultants representing the Ministry of Health, Ministry of Higher Education, Police and military forces. They are working in twenty three hospitals in twelve cities in the country.

One hundred forty six responded **(sample size)** to the questionnaire.

The response rate for each question was high and ranged from 84.9% to 100%; with a mean response rate of 94.6%.

5.1. The results of the study showed that evaluation of graduates´ knowledge and cognitive abilities were: **(1)** In knowledge related to common and endemic diseases graduates were rated as poor 2 **(**1.39%**),** below average 5 **(**3.47%**),** average 40 **(**27.78%**),** good 74 **(**51.39%**)** and excellent 23 **(**15.97%**). (2)** In knowledge related to basic sciences including knowledge about body structure, function and patho-physiological processes graduates were rated as poor 3 (2.14%), below average 11 (7.86%), average 42 (30%), good 64 (45.71%) and excellent 20 (14.29%). **(3)** In knowledge related to clinical sciences including knowledge relating to disease causation, manifestation and management graduates were rated as poor 2 **(**1.43%**),** below average 3 **(**2.14%**),** average 32 **(**22.86%**),** good 63 **(**45 %**)** and excellent 40 **(**28.57%**). (4)** In knowledge related to Essential drugs; their proper use, side effects and interactions graduates were rated as poor 4 (2.90%), below average 24 (17.39%), average 34 (24.64%), good 64 (46.38%) and excellent 12 (8.69%). **(5)** In knowledge related to social, economic and cultural factors related to disease and its causation, management and prevention graduates were rated as poor 2 (1.45%), below average 7 (5.07%), average 25 (18.12%), good 61 (44.20%) and excellent 43 (31.16%). **(6)** In knowledge related to requesting the appropriate investigations when needed graduates were rated as poor 1 (0.69%), below average 5 (3.47%), average 40 (27.78%), good 62 (43.06%) and excellent 36 (25%). **(7)** In Knowledge related to interpreting the laboratory results and images investigations obtained graduates were rated as poor 1 (0.7.%), below average 5 (3.52%), average 40 (28.17%), good 68 (47.89%) and excellent 28 (19.79%). **(8)** Knowledge related to clinical reasoning (use information derived from history and examination of the patient to make a list of probable diagnoses) graduates were rated as poor 1 (0.73%), below average 3 (2.17%), average 26 (18.84%), good 70 (50.72%) and excellent 38 (27.54%). **(9)** In knowledge related to outlining and implementing a management plan graduates were rated as poor 2 (1.45%), below average 2 (1.45%), average 38 (27.53%), good 64 (46.38%) and excellent 32 (23.19%). **(10)**

*The **overall evaluation** of graduates´ knowledge and cognitive abilities was rated as excellent (21.55%), good (46.75%), average (25.12%), below average (5.15 %) and poor (1.43%) (Figure 1).*

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5.2. The results the study showed the evaluation of graduates in skill domain as follows: (1) In skills related to taking a thorough medical history graduates were rated as poor 1 (0.69%), below average 3 (2.05%), average 19 (13.01%), good 81 (55.48%) and excellent 42 (28.77%). **(2)** In skills related to conducting proper and systemic bedside examination and eliciting important signs graduates were rated as poor 3 (2.05%), below average 5 (3.42%), average 40 (27.40%), good 62 (42.47%) and excellent 36 (24.66%). **(3)** In skills related to performing diagnostic procedures graduates were rated as poor 3 (2.08%), below average 9 (6.25%), average 36 (25%), good 62 (43.06%) and excellent 34 (23.61%). **(4)** In skills related to perform basic skills procedures graduates were rated as poor 2 (1.37%), below average 7 (4.80%), average 24 (16.44%), good 68 (46.57%) and excellent 45 (30.82%). **(5)** In skills related to perform therapeutic intervention processes graduates were rated as poor 4 (2.9%), below average 8 (5.8%), average 38 (27.53%), good 56 (40.58%) and excellent 32 (23.19%). **(6)** In skills related to give emergency management graduates were rated as poor 4 (2.86%), below average 10 (7.14%), average 22 (15.71%), good 54 (38.58%) and excellent 50 (35.71%).
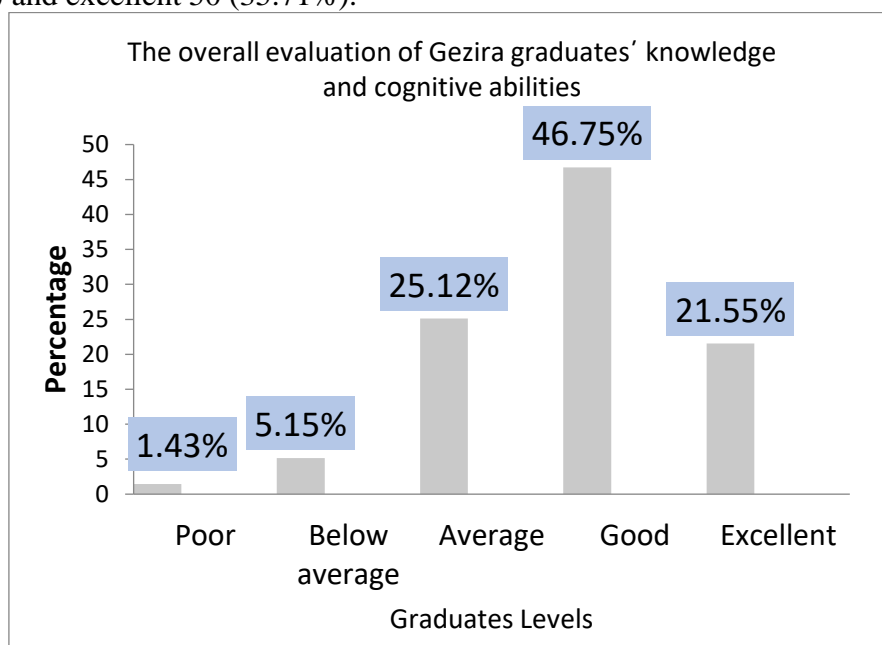

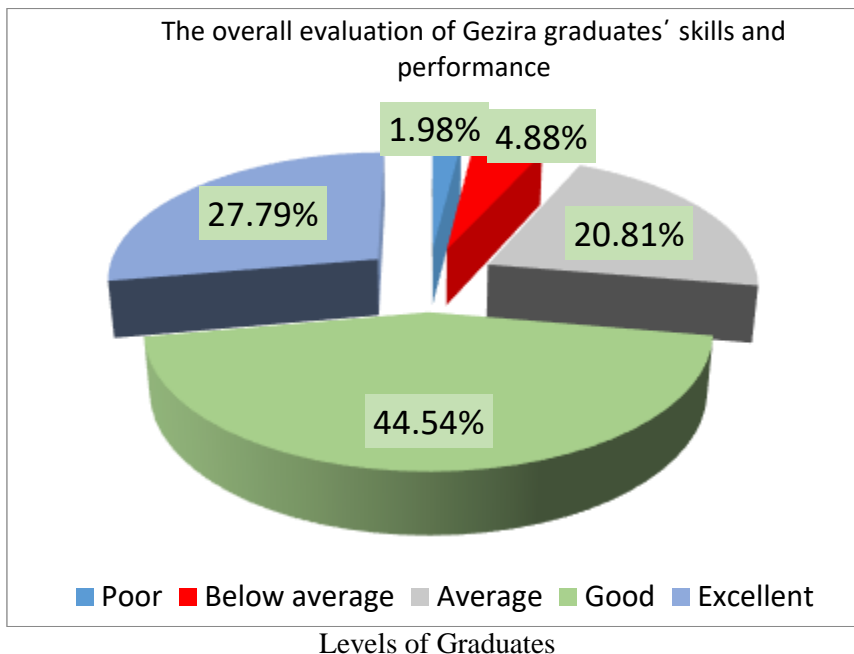**Figure 1: The overall evaluation of Gezira graduates´ knowledge and cognitive abilities**

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The overall evaluation of Gezira graduates′ skills and performance

1.98% 4.88%

27.79% 20.81%

44.54%

■ Poor ■ Below average ■ Average ■ Good ■ Excellent

Levels of Graduates

Figure 2: The overall evaluation of Gezira graduates´ skills & performance
(7) *The **overall evaluation of graduates´ skills and performance** was rated as excellent (27.79%), good (44.54%) average (20.81%), below average (4.88%) and poor (1.98%) (Figure 2).*

5.3. The results of the study showed that evaluation of graduates´ in attitudes domain: **(1)** In attitudes related to concern, respect and empathy towards patients and their families graduates were rated as poor 0 (0%), below average 8 (5.88%), average 18 (13.24%), good 56 (41.18%) and excellent 54 (39.70%). **(2)** in attitudes related to working and maintaining good relations with medical colleagues graduates were rated as poor 1 (074%), below average 3 (2.24%), average 8 (5.97%), good 52 (38.81%) and excellent 70 (52.24%). **(3)** in attitudes related to working in team & harmony with other health professionals & technicians graduates were rated **as** Poor 4 (2.94%), below average 9 (6.62%), average 17 (12.50%), good 52 (38.24%) & excellent 54 (39.70%). **(4)** in attitudes related to concern and taking the responsibility of teaching auxiliary staff graduates were rated as poor 2 (1.54%), below average 2 (1.54%), average 42 (32.30%), good 54 (41.54%) and excellent 30 (23.08%). **(5)** In attitudes related to attendance and punctuality graduates were rated as poor 3 (2.21%), below average 6 (4.41%), average 29 (21.32%), good 58 (42.65%) and excellent 40 (29.41%). **(6)** In attitudes related to commitment and dedication graduates were rated as poor 4 (3.03%), below average 4 (3.03%), average 24 (18.18%), good 62 (46.97%) and excellent 3 (28.79%). **(7)** in attitudes related to general appearance graduates were rated as poor (0%), below average 2 (1.61%), average 32 (25.81%), good 61 (49.19%) and excellent 29 (23.39%). **(8)** in attitudes related to ability to express his ideas clearly and fluently graduates were rated as poor 2 (1.47%), below average 10 (7.35%), average 26 (19.12%), good 58 (42.65%) and excellent 40 (29.41%). **(9)** in attitudes related to understanding and respecting hospital regulations and administrative matters graduates were rated as poor 2 (1.47%), below average 6 (4.42%), average 36 (26.47%), good 50 (36.76%) and excellent 42 (30.88%). **(10)** in attitudes related to ability to keep good patients records and follow up sheet graduates were rated as poor 3 (2.24%), below average 7 (5.22%), average 30 (22.39%), good 70 (52.24%)

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and excellent 24 (17.91%). **(11)** in attitudes related to decision making abilities graduates were rated as poor 2 (1.43%), below average 4 (2.86%), average 42 (30%), good 60 (43.57%) and excellent 32 (22.14%).
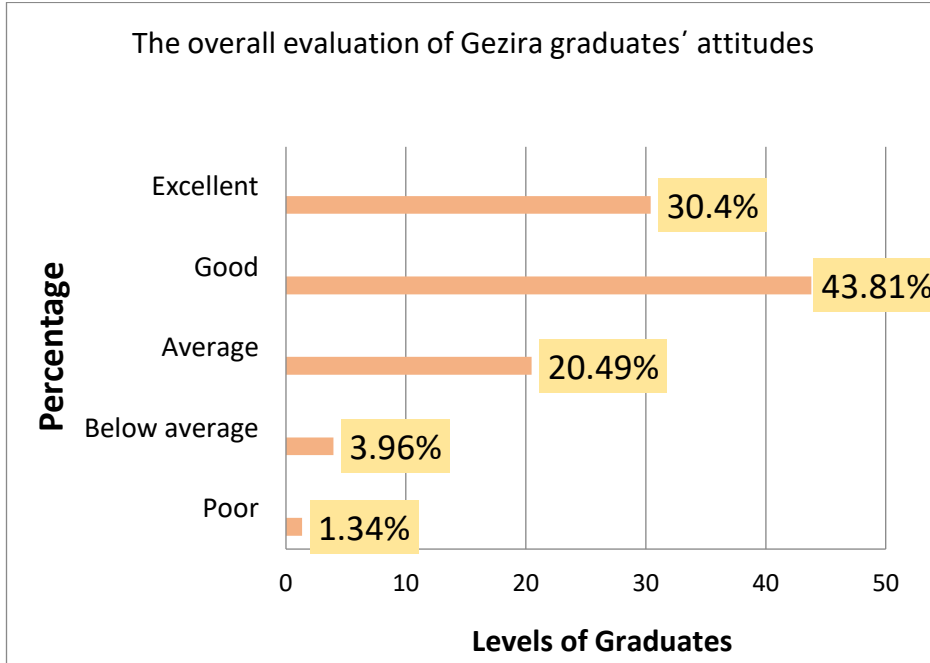
The overall evaluation of Gezira graduates´ attitudes

Level	Percentage
Excellent	30.4%
Good	43.81%
Average	20.49%
Below average	3.96%
Poor	1.34%

Percentage (y-axis) — **Levels of Graduates** (x-axis: 0, 10, 20, 30, 40, 50)

Figure 3: the overall evaluation of graduates´ attitude, moral and ethical   standards

IV: The overall evaluation of graduates

Level	Percentage
Excellent	23.19%
Good	59.42%
Average	14.49%
Below average	2.17%
Poor	0.73%

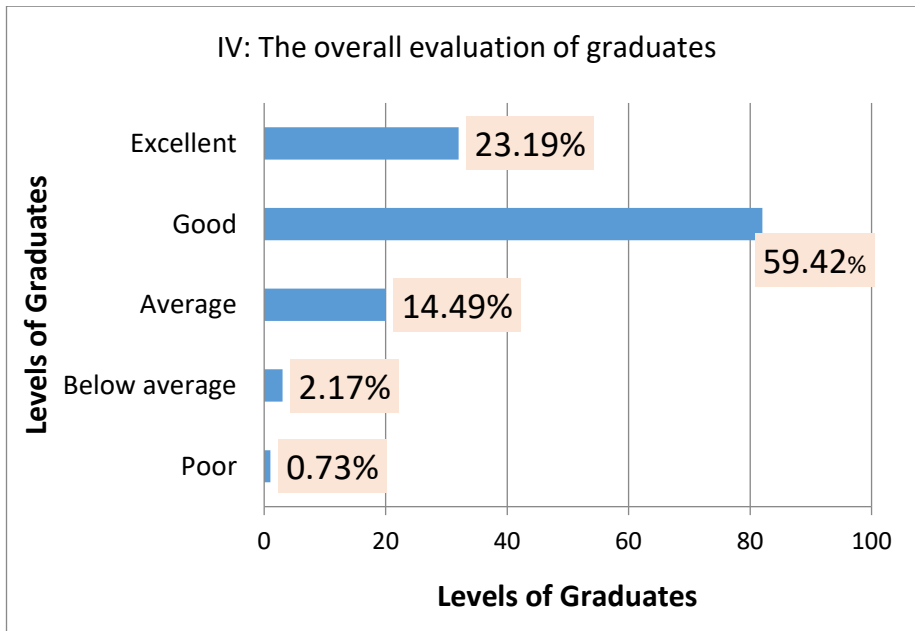**Levels of Graduates** (y-axis) — **Levels of Graduates** (x-axis: 0, 20, 40, 60, 80, 100)

Figure 4: The overall evaluation of graduates

 (12) in attitudes related to problem solving abilities graduates were rated as poor 2 (1.47%), below average 4 (2.94%), average 32 (23.53%), good 70 (51.47%) and excellent 28 (20.59%). **(13)** in attitudes related to possessing good counselling skills graduates were rated as poor 2 (1.43%), below average 12 (8.57%), average 34 (24.29%), good 63 (45%) and excellent 29 (20.71%). **(14)** In the *overall moral and ethical standards* graduates were rated as excellent 56 (40.58%), good 60 (43.48%) average 22 (15.94%), below

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average 0 (0%) and poor 0 (0%) (Figure 3).

5.4 The overall evaluation of graduates was excellent (23.19%), good (59.42%), average (14.49%), below average (2.17%) and poor (0.73%) (Figure 4).

6. Discussion:

The consultants who responded to the questionnaire were146 consultants of the Ministry of Health, Ministry of Higher Education, Police and military forces working in 23 hospitals in 12 cities. All of them were not staff members in the FMUG, were not Gezira graduates and were not actively involved in Gezira student training. Hence results are reliable as bias was avoided.

In the overall evaluation of graduates´ knowledge and cognitive abilities ,graduates were rated as good to excellent in more than two thirds (68.3%), average in about the quarter (25.12%) and poor to below average in only a minority of the graduates. These results are very much resembling results of other studies in favor of that graduates of innovative schools are not less or even better in knowledge compared to graduates of conventional schools [18, 19, 20, 21]. This could be explained by usage of more student centred instructions and integration of basic and clinical sciences. Thus, learning will be more meaningful and motivating to the students. This will be reflected in better acquisition, storage and retrieval as evident by the constructivist theory.In the overall evaluation of graduates´ skills and competences, graduates were rated as good to excellent in nearly three quarters (72.33%), average in one fifth (20.81%) and poor to below average in only a minority of the graduates.

The study results match many researches concluding the superiority of innovative programs graduates in clinical skill and as practitioners [17, 22, 23]. This is explained by adoption of the student centred instructions, integration, early clinical exposure, training in existing sites of the future practice and training in the community. This aids learning in contextual and real life experience.

In the overall evaluation of attitudes and ethical standards, graduates were rated as good to excellent in the majority (84.06%).

These results are similar to studies conducted by others researchers [21, 22, 23, 24, 25, 26]. Explanations are again the more student-centred approach, integration of basic, behavioural and clinical sciences, emphasis on team work activities, community based activities and early clinical exposure.

In the overall evaluation, graduates were rated as good to excellent in the vast majority (82.6%), average in the minority (14.5%) and poor to below average in only a few cases.

These results are accepted since many studies showed that graduates of innovative programs are expected to be superior in clinical performance and skills and thus better practitioners [22], are more motivated [26, 27] and retain and recall knowledge better than students of conventional curriculum [19]. They are better in critical thinking, analysis and hypothesis driven reasoning [20]. They are also better prepared in independent learning skills [22], interpersonal skills, team participation, problem solving, better in teaching others [25] and are therefore better life-long learners. [26]

The need for innovation in medical education is ongoing [29]. It is clearly due to continuous advancement of science with explosion of knowledge. Hence, it is more appropriate to graduate life-long learners than knowledge consumers [30]. Basic sciences are needed to be meaningful and taught in contexts in order to be adequately retained and retrieved when needed. "Soft skills" need to be learned by professionals including

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clinical reasoning, working in team, communicating effectively, application of skills, management and leadership. Furthermore, there are advancement in information technology and progression in educational theories [31]. Hence, the FMUG adopted its innovative programme in order to achieve these goals and to meet all these needs.

7. Conclusions and recommendations:

7.1 . Conclusions

The evaluation of graduates' competences is one of the important elements in the educational programme evaluation. The response rate for the questionnaires was highly acceptable and the response rate for each question was high and acceptable as well. Bias was minimized by the exclusion criteria. Hence, results obtained are representative and valid. The overall Gezira graduates´ competences evaluation showed that the majority of the graduates were rated good to excellent in knowledge, skills and attitudes. These good results are in favour of the Gezira innovative programme and are in agreement with many similar studies. Hence, the results help in formulating the decision of continuation of the programme and guide further studies for consolidation. These results also provide evidence of the programme product for quality assurance and accreditation. Such results will encourage other medical schools to adopt the same educational approach in their curricula.

7.2. Recommendations

The evaluation of graduates' competences is one of the important elements in the educational programme evaluation. It should be conducted regularly to provide evidence for the programme product and a measure for quality assurance. Results should be published and disseminated to provide enough data and convincing evidence for the Gezira innovative experience and to encourage other medical schools to adopt the same educational approach in their curricula. Other aspects of graduates' evaluation should be taken into consideration in further studies. These including; (i) graduates self evaluation of their self-satisfaction in professional competencies of their knowledge, skills and attitudes learned. (ii) The actual number of graduates working at the primary care level, their contribution to community development, obstacles facing their enrolment in community service and factors influencing their career choice. (iii) Graduates performance and results in examinations and fellowships including national, regional and international and other qualifications. A mechanism for graduates tracking should be established. This could be achieved by developing follow-up records of the numbers of graduates working in the different sectors and fields, their qualifications, positions, locations and inputs.

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