

Assessment of the student learning outcomes for the research course (CMED 305) from 2011 to 2014 at college of medicine, King Saud University

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ABSTRACT:

Introduction: Health research courses are an important component of medical education to improve medical care.(1) Studies have proven that research experience during medical college strongly associated with postgraduate research initiatives.(2,3) CMED-305 course is the first gate for students in College of Medicine, King Saud University, Riyadh, Saudi Arabia, to enter medical research life. The research will give a feedback to Community Medicine Department to help them in the process of course development. In addition, the course progress has never been assessed for the last three years.

METHODOLOGY: The study was a quantitative observational cross sectional study and it took place at the college of medicine, King Saud University, Riyadh, Saudi Arabia. The inclusion criteria for this study were 4th , 5th medical students and interns who fulfilled (CMED 305) course from 2011 to 2014. the exclusion criteria were medical students who did not fulfill (CMED 305) course or fulfilled the course before 2011. Data was collected by soft copy questionnaire. Data of questionnaire and variables were subdivided into the following categories, staff supervising positives, and negatives, skills

gained from the course, attitude toward the course and research, in general, difficulties encountered during course fulfillment and knowledge that gained by students during the course. Statistical analyses were performed using the Statistical Package for the Social Sciences (SPSS).

Results: Questionnaires were sent to 174 students who have completed the research course in the last three academic years; 4th, 5th year medical students and interns. One hundred students out of 174 responded to the questionnaires. Overall, students showed “natural” attitudes towards the course (mean 5-point likert scores: 3.32) in Bar chart 1. Significant differences were found between students of 4th and 5th years regarding cooperation of team members to achieve success, the students' attendance during course's lectures. In addition, between 4th year medical students and interns regarding their attitude toward encouragement to participate in future researches. Communication difficulties between students in 4th 5th and intern student had a mean of 3.32 (Neutral). The percentage, mean and standard deviation of students' responses to questionnaire testing some knowledge acquired by the course were shown in Table 1. Project difficulties, Overall participants agreed that they faced some difficulties while collecting their data and most of the responses agreed that students faced difficulties in publishing their work. On the statement “The research course interfered with my effort for studying other courses” 40% of the responses were strongly agree and 34% were agree. About time difficulty overall, students showed “agreed” response with (mean 5-point likert scores: 3.32) on the statement “The research course interfered with my effort for studying other’.

Conclusion: Overall, students showed “natural” attitudes towards the course (mean 5-point likert scores: 3.32). Mean scores of students were 62.33% on knowledge scale

and mean of 3.32 (neutral) on attitude scale. Communication difficulties between students had a mean of 3.23 (natural). Overall participants faced some difficulties while collecting their data mean of 3.91 (agree). In the Time, difficulty students showed “agree” response with mean 3.50. We recommend universities that have a research course for medical students to readjust research course’s lectures hours to make students have sufficient effort for other courses. Moreover, we recommend adding lectures in research course talking about “how to publish a research”, course’s students to get proper SPSS training. Finally, we recommend students to choose a topic that can be collected with a sufficient amount of responses.

BACKGROUND:

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Health research courses and programs have been recognized as an important component of medical education because the rapid expansion and progress in biomedical research which is expected to improve medical care. [1] It is essential to inculcate critical thinking and reasoning skills and to develop a positive attitude amongst students towards scientific research from the beginning of their medical career. [2] Studies have proven that research experience during medical school is strongly associated with postgraduate research initiatives. [3, 4]

King Saud University (KSU), students are required to conduct medical researches during CMED (305) course in 3rd year of college of medicine. This course is organized by Community Medicine Department .The overall objectives of this course are to enable students understand basic elements of research, design and conduct a study to answer a

specific research question. [5] CMED (305) course in King Saud University (KSU) at College of Medicine uses a very old curriculum for about 20 years. In 2011 the course was evaluated, and the evaluation process resulted in a major encasements in the course curriculum.

In general, medical students' attitude depends on their knowledge it was noticed that students with previous experience, and fair amount of knowledge have positive attitude toward researches, while students with no previous experience revealed negative attitude. [6] Furthermore there has been a significant movement towards providing medical students with early research experience within the medical school curriculum. [7, 8, 9] Medical students demonstrate moderate level of knowledge and attitude towards health research. Intensive training in this regard is associated with significant improvement in knowledge and attitudes of students towards health research. [10]

Research supervision is an important component of research courses and programs. Beginning supervisors need to understand the dynamics and practicalities of supervision before they embark on this process. [11] Many Studies described an apparent effect of supervising on research productivity, and success. [11, 12,13 14,15, 16, 17] Supervisors increased students' self-confidence [11] and provided support and resources for research activities. [13, 14, 15] Skills learnt in the classroom cannot be transformed into output without help. Undergraduate researchers require guidance on how to steer their way to success in a career of health research. [18] Lack of supervision was identified as a specific barrier to completing research projects and publication. [12, 16, 17]

Medical students researchers all over the world often encounter difficulties. [18] These difficulties need to be evaluated to improve the involvement of students in research activities. [19] A study showed researchers in university hospitals need more training regarding clinical research, particularly in biostatistics. They also require administrative

assistance. It has indicated that the quality of clinical research could be improved if training in clinical research methodology and biostatistics were provided. [20]

Medical researchers and ethicists emphasize the importance of equity, fairness and justice in general medical research participation. No individual or group should be over-represented or under-represented in research-there should be fair participation. Thus far little thought has been given to fair participation in medical education research. [19] Many young researchers engage in health research with little guidance about the expectations and challenges awaiting them. There is limited leadership to help guide youth. [20]

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RESEARCH METHODOLOGY:

Study design:

The proposed research is quantitative observational cross sectional study design, with a sample that will include fourth, fifth male medical students and male interns who

fulfilled (CMED 305) course from 2011 to 2014. The time period of this study will be from January to March 2015.

Study setting:

The study took place at the College of Medicine of King Saud University in Riyadh.

Study Population:

The inclusion criteria for this study are fourth, fifth male medical students and male interns who fulfilled (CMED 305) course from 2011 to 2014. The exclusion criteria are female, medical students who fulfilled (CMED 305) course before 2011.

Sample size:

It determined by using this formula, $n = z^2 p (1-p) / d^2$ where n = calculated sample size, z = standard normal deviate at 95% confidence interval = 1.96, P = proportion of respondents that reported and the precision (0.05). In Norway, there is similar study design; the response rate was 87% to the questionnaire. Therefore, $P = 0.87$. [21]

$$n = \frac{1.96^2 \times (0.87 (1 - 0.87))}{0.05^2} = 174$$

Sampling technique:

It was convenient sampling. (Non-random)

Data collection methods:

The data collected by soft copy questionnaire, if it is not applicable, we changed to hard copy questionnaire. Data collected from fourth, fifth male medical students and male interns who fulfilled (CMED 305) course from 2011 to 2014. The questionnaire distributed as self-administrated. Data of questionnaire and variables are subdivided into

categories, there are barriers faced by students during the course (CMED 305), the impact of supervisors during the course and skills and Attitude developed after course fulfilled.

The questionnaire formed and these are the variables that it based upon the Staff supervising positives and negatives, knowledge gained from the course, skills gained from the course, attitude toward the course, and research in general and difficulties (choosing a research, writing protocol, communication between members, and members with supervisor, time management, choosing a supervisor, research submission deadlines and others).

Pilot study:

We distributed a pilot study to 10-15 students, to evaluate the efficacy of the questionnaire.

Data analysis plan data:

Statistical analyses performed using the Statistical Package for the Social Sciences (SPSS Inc., Chicago, IL, USA). Descriptive statistics used to analyze the responses between students of different years and previous research experience.

Ethical considerations:

The privacy of participants' information protected and only used for research proposes. The participant got a clear consent form of the study objectives.

RESULTS:

Questionnaires were sent to 174 students who have completed the research course in the last 3 academic years; 4th, 5th year medical students and interns, 58 students from each year. One hundred students out of 174 responded to the questionnaires; 48 from 4th year, 21 from 5th year and 31 from interns (overall response was 57.47%).

ATTITUDES TOWARD THE RESEARCH COURSE:

Overall, students showed “natural” attitudes towards the course (mean 5-point likert scores: 3.32).

A significant difference was found between students of 4th and 5th years regarding cooperation of team members to achieve success (mean 5-point likert scales: 3.54 vs. 2.76; $p < 0.02$), students attendance during course’s lectures (mean 5-point likert scales: 3.73 vs. 3.14; $p < 0.04$) also there were a statistical significant difference of means was identified between 4th year medical students and interns regarding their attitude toward encouragement to participate in future researches (mean 5-point likert scales: 3.96 vs. 3.42; $p < 0.01$). No significant difference was found between students regarding their response to other items determined in the questionnaire.

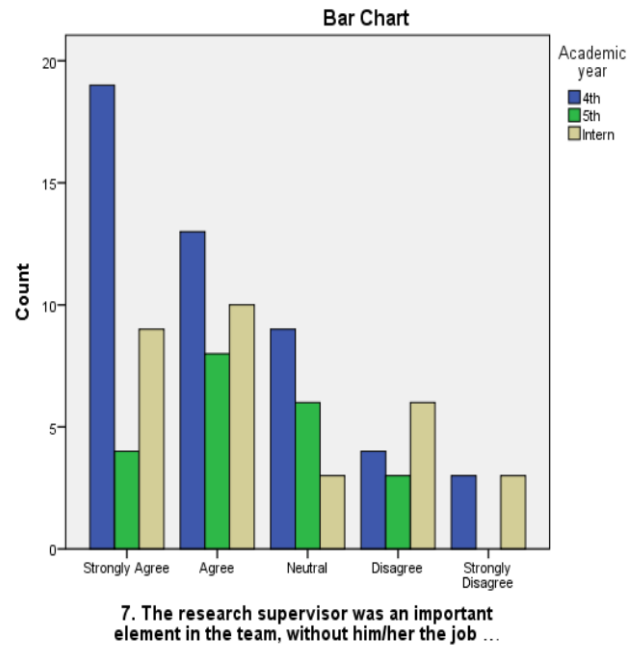


Chart 1

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Skills gained from the course:

We asked students about their skills gained from the course; the result came back with mean 3.35 and SD 0.61 which is Neutral.

There was a significant difference between 4th year medical students and interns regarding improvement of communication skills by the course (mean 5-point likert scales: 3.27 vs 3.65; $p < .049$). No significant difference was found between the 3 different groups regarding their response to other items in the “skill” topic.

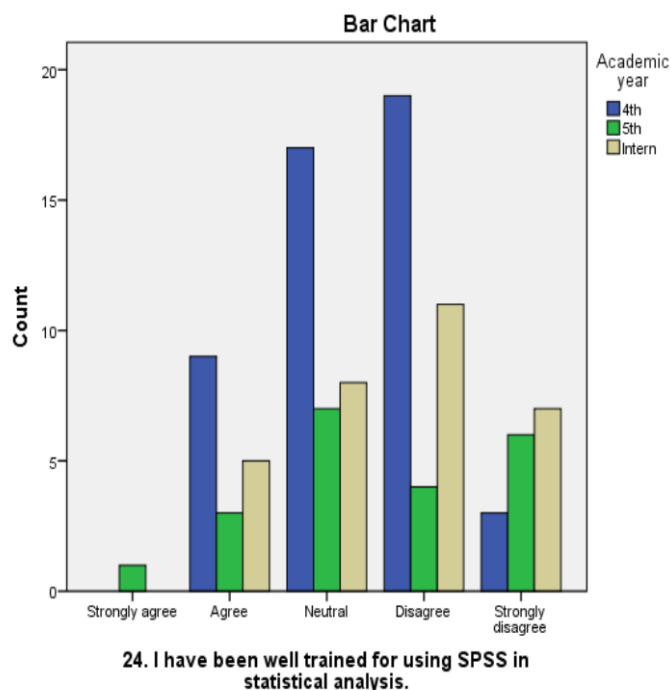


Chart 2

Communication difficulties:

Communication difficulties between students in 4th 5th and intern student had a mean of 3.23 (natural)

There was a significant difference between 4th and 5th year medical students (mean 5-point likert scales: 3.54 vs. 2.57; $p < 0.004$), as well as between 5th year medical students and interns (mean 5-point likert scales: 2.57 vs. 3.48; $p < 0.015$) regarding their response to the statement: "The work was distributed fairly between students". No significant difference between groups was found regarding students' responses to other items determining communication difficulties.

Project difficulties:

Overall participants faced some difficulties while collecting their data (mean 5-point likert scale 3.91 which is "agree"). As for the following statement "it was easy for us to publish our work" the result was (mean 5-point likert scale 2.48) which is "disagree".

45% and 28% of all participants agreed and strongly agreed respectively that they had difficulties while collecting data.

A statistically significant difference of means was identified between 4th year medical students and interns regarding their responses to the statements: "College of Medicine supplied us by all our research needs (Money, pre-paid software, printers)" (mean 5-point likert scales: 2.96 vs. 2.00; $p < 0.01$), ".College of Medicine helped us to access data needed to fulfill our research" (mean 5-point likert scales: 3.65 vs. 3.00; $p < 0.01$) and "We had enough budgets for our research" (mean 5-point likert scales: 3.06 vs. 2.58; $p < 0.03$).

Time management difficulty:

Overall, students showed "agree" response with (mean 5-point likert scores: 3.50).

On the statement "The research course interfered with my effort for studying other courses" 40% of the responses were strongly agree and 34% were agree.

There was a significant difference between 4th and 5th year medical students regarding their response to the statements: "We managed our time properly" (Mean 5-point likert scales: 3.73 vs 3.24; $P < .029$) and "The research course interfered with my effort for studying other courses" (Mean 5-point likert scales: 4.31 vs 3.81; $P < .032$).

A significant difference was present between 4th year medical students and interns regarding their responses to the statements: "I had enough time to conduct a successful research" (Mean 5-point likert scales: 3.25 vs 3.87; $P < .008$) and "The research course interfered with my effort for studying other courses" (Mean 5-point likert scales: 4.31 vs 3.77; $P < .016$). A significant difference was also found between 5th year medical students and interns regarding their responses to the statement: "We managed our time properly" (Mean 5-point likert scales: 3.24 vs 3.97; $P < .001$).

Knowledge:

The percentage, mean and standard deviation of students' responses to questionnaire testing some knowledge acquired by the course were shown in Table 1. There was no significant difference between 4th year, 5th year and interns regarding their knowledge.

	TR UE	FAL SE	Mea n	Std. Deviation	Corr ect Answer
A research protocol is a detailed written plan of the proposed research study	28 %	72%	1.72	.451	TRU E
Medline is the first and best known "online" medical journal	61%	39%	1.39	.490	FAL SE
A scale from 1 to 5 (like grades on an examination) is called ordinal data	46 %	54%	1.54	.501	TRU E
Total			1.55	0.31	

Table 1

DISCUSSION:

The present study aimed to evaluate the progress of the research course (CMED 305) during the last 3 years by analysis of the students' responses to a questionnaire covering several items concerning this course.

The results showed that there was an overall neutral response regarding communication between group members and the course organizer, this shows that students didn't face difficulty while communicating during the course.

All 3 groups (4th year students, 5th year students and interns) demonstrated a moderate level of knowledge acquired by the course, which reflects the importance of this course for students to acquire knowledge about research elements.

Students agreed about the importance of the supervisors' role. The priority for the students for choosing their supervisor was based first on his/her expertise regarding the research field and methodology.

Students of 4th medical year faced less difficulties during course fulfillment compared to 5th year medical students and interns. However, still most of the students faced difficulties while collecting data and publishing their work.

The present results also showed that the students of the 4th medical year had more positive attitude toward the research course. Their desire to learn more about research was evidenced by their increasing interest to attend lectures of the course and their eagerness to participate in future researches.

Regarding skills acquired by the course, most of the students agreed that this course helped them to improve their communication skills, but did not train them for using SPSS in statistical analysis. In general, skills gained by students of the 4th year seemed to be more than those gained by the other 2 groups.

Results showed an overall neutral response regarding time interval for data submission, as well as, correlation between course teaching and submission dates. On the other hand, there was a general agreement about students' ability to manage their time properly, to conduct a successful research and to finish submission of work in specified deadlines, with a significant difference in favor to students of 4th year. This indicates that students are getting better in managing their time.

Most of the students agreed that the research course interfered with their efforts for studying other courses, with a significant difference in favor to the students of the 4th year. This might be due to the increase in the credit hours of the course, from 4 to 6 hours, which added more load to students nowadays. Furthermore, we think that there was no conflict between students' response toward their ability to manage time properly and toward course interference with their study of other courses. We believe that students struggle to give enough time to fulfill the research course properly, but on the expense of the time needed to study the other courses.

In conclusion, Mean scores of students were 62.33% on knowledge scale and mean of 3.32 (neutral) on attitude scale. Also, Communication difficulties between students had a mean of 3.23 (natural).

Overall participants faced some difficulties while collecting their data mean of 3.91 (agree) and the Time difficulty students showed response with mean 3.50 (agree).

Regarding the limitations of the study. First, the response rate of 57.47% is somewhat less than what was expected and this is likely related to the decision to approach the student body with a hard copy of the study rather than a softcopy survey. Second, we faced issues during data analysis

CONCLUSION:

Finally, we recommend to Community Medicine Department to readjust research course's lectures hours, to make students have sufficient effort for other courses. Also, adding lectures in research course talking about "how to publish a research" and SPSS training. Moreover, we recommend students to choose a topic that can be collected with a sufficient amount of responses.

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