



RESEARCH ARTICLE

REVISED **Successful implementation of Medical Education Faculty Development Project at Saint George University of Beirut in the immediate post triple blow to Beirut [version 2; peer review: 2 approved]**

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Abstract

Background

The aim of this study is to explore the efficacy of the Faculty Development Program (FDP) implemented at the Saint George University of Beirut-Faculty of Medicine (SGUB FM) under exceptional circumstances as the triple blow to Beirut.

Methods

The Faculty Development, directed towards a cohort of 35 faculty members, is composed of two major components: methodology of teaching and techniques of assessment. The Kirkpatrick's assessment model, in combination with a specifically designed psychological questionnaire, were chosen to assess the effectiveness of the faculty development initiative.

Results

Results of the different questionnaires were interpreted individually, then through the lens of the psychological questionnaire. A majority of faculty (55%) were significantly affected psychologically by Beirut's triple blow and 77% of all participants found the workshops to be of excellent quality (Kirkpatrick's Level I). Moreover, Kirkpatrick's level II

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results yielded a 76% mean percentage of correct answers to post-workshops MCQs and a significant improvement in the mean results of the self-assessment questionnaires, administered before and after each workshop. Results also show that the more a trainee is psychologically affected, the less he/she performs as evidenced by a decrease in the satisfaction rate as well as in the score of the cognitive MCQs and of the self-assessment questionnaires.

Conclusions

This study was able to highlight that significant learning can occur amidst exceptional circumstances like the Beirut triple blow and administration should invest in professional growth to retain its faculty.

Keywords

Faculty Development, Medical Education, Kirkpatrick's evaluation framework, Beirut's triple blow, University Medical Center

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REVISED Amendments from Version 1**Introduction:**

The introduction has been restructured to provide a more engaging and comprehensive context for the faculty development initiative. It now highlights the existing literature on faculty development efforts during challenging circumstances. The revised introduction also underscores the importance of psychological factors affecting faculty development, setting the stage for the study's significance.

Methods:

In the Methods section, I have clarified the study setting and the medical school's curriculum context, providing a better understanding of the environment in which faculty operate as educators. Additionally, the faculty development program's details have been expanded upon, including the structure, facilitators, and post-workshop activities. This adds depth to the description of the intervention's rationale and effectiveness, addressing the validity and trustworthiness of the workshops.

Results:

The Results section now features clearer and more precise statements, replacing vague terms like 'significantly' with specific p-values. This enhances the transparency of the findings. Additionally, I have provided the rationale for selecting the Wilcoxon Signed Rank Test over a t-test for analyzing the pre-post workshop psychological questionnaire results.

Discussion:

The Discussion section has been augmented to incorporate a more in-depth comparison with similar faculty development studies conducted in different settings, focusing on the contextual differences and their implications. Furthermore, the discussion now presents practical recommendations and potential impacts of this study in other settings, while also addressing the limitations more explicitly.

Conclusion:

The conclusion has been strengthened by aligning it with the research questions and evaluation questions elucidated in the revised introduction.

In summary, the manuscript has been thoroughly revised to address the reviewers' comments, enhancing its clarity, relevance, and contribution to the field of faculty development in challenging circumstances. The changes made ensure that the work is now more clearly and accurately presented and is grounded in the current literature on faculty development.

Any further responses from the reviewers can be found at the end of the article

Introduction

In the dynamic tapestry of global medical education, one constant remains: the necessity to evolve and adapt. Faculty development programs (FDPs) have stood as testaments to this evolution, with robust evidence from both the U.S. and the international community affirming their impact on amplifying teaching effectiveness¹⁻⁷. The exigencies of the COVID-19 era further catalyzed this evolution, making the shift from traditional classrooms to innovative online platforms not just a trend, but an imperative, especially when in-person pedagogical interactions became untenable. Studies like Zuo *et al.*, 2021⁸ offer insights into this paradigm shift, while other research underscores the pivotal role of educators' psychological well-being in pedagogical success^{9,10}.

Yet, how do these initiatives fare amidst unparalleled adversities? Most academic contexts have not been tested against a confluence of challenges as seen in Beirut. Here, the city grappled with a triad of crises - the destabilization of its banking system since 2019, the ravages of the COVID-19 pandemic, and the profound trauma of the Beirut Explosion on August 4, 2020. The repercussions were particularly acute for the venerable Saint George Hospital University Medical Center (SGHUMC), a beacon of medical excellence since 1878.

On the edge of these tumultuous events, SGHUMC was in the midst of transformative strides. The inauguration of the Saint George University of Beirut (SGUB) in 2018 marked the dawn of an avant-garde medical school (SGUB FM) with visions set on global accreditation and pioneering educational approaches. However, challenges were manifold, with the institution confronting the inertia of a two-decade-old didactic curriculum and a prolonged hiatus in faculty development.

Confronted by these layered challenges, the leadership of the university demonstrated an unwavering resolve towards modernization, envisioning a rejuvenated curriculum and bolstered faculty capabilities. Demonstrating an inspiring resilience against the myriad challenges Beirut presented, the faculty stood resolute in their pedagogical mission. This study explores the inception and challenges of the Curriculum Development Program at SGUB FM, emphasizing the relentless pursuit to empower educators amidst such monumental challenges.

Methods**Study population**

In preparation for the inaugural MED I class in September 2022, SGUB FM's Dean's Office targeted a faculty development initiative at a group of 35 faculty members, none of whom had prior formal training in faculty development in medical education. This cohort encompassed members of the Curriculum Committee and educators responsible for the MED I and MED II curriculum segments, all of whom concurrently serve as practicing physicians at SGHUMC.

Settings and study design

To support this initiative, an interventional study was launched, piloting a Faculty Development Program (FDP) with an emphasis on student/learner-centered pedagogy. This FDP was meticulously crafted to be interactive, positioning participants at the heart of all discussions. Beyond the core sessions, the workshops were enriched with self-paced readings and follow-up tasks. Upon completing the program, participants were awarded certificates.

Program Modules:

The FDP encompassed the following ten workshops:

1. Introduction & Characteristics of Adult Learning
2. Learner-centered Classes
3. Group Work
4. Interactive Lecturing

5. Project-based Learning
6. Flipped Learning
7. Assessment: Formative and Summative
8. Assessment: Rubrics
9. Team-based Learning
10. Reflections

Implementation:

For each module, a facilitator from the American University of Beirut Center for Teaching and Learning was invited to the SGUB FM premises to lead an interactive workshop. These sessions spanned over a six-month period, with ten sessions in total, each lasting two hours.

Program Components:

The FDP was designed around two primary components: teaching methodologies and assessment techniques. Given the importance of reflections in enhancing learning experiences, the program culminated with a dedicated session for participants to share and discuss any transformations in their teaching methodologies.

Rationale for Workshop Selection:

Despite the COVID-19 pandemic, there were key reasons for choosing in-person workshops:

- **Vaccination:** All participants had two doses of the Pfizer vaccine, lowering transmission risk.
- **Safety:** On-site sessions followed strict safety rules, like mask-wearing, good ventilation, and distancing.
- **Better Engagement:** Face-to-face meetings enable richer discussions and real-time feedback compared to virtual settings.
- **Avoiding Screen Burnout:** Too much virtual meeting time can lead to fatigue. In-person sessions offered a screen break.
- **Practical Learning:** Some topics, like group tasks, thrive in a hands-on, in-person environment.

The Kirkpatrick's (1976)¹¹ assessment model consisting of four levels (appendix 1), was adopted to evaluate the effectiveness of the faculty development initiative due to its simplicity, its assessment of a limited number of variables, the ease of its evaluation criteria, the lack of requirement to collect participants' basic data or past performances as well as the independence of individual and environmental variables¹². Two levels were developed: Reaction – Level 1 detailed in appendix 2, and Learning – Level 2 detailed in sessions 1 to 9 'Post workshop Multiple Choice Questions' and 'Retrospective Pre and Post' questionnaires.

The retrospective pre–post method (RPP) offers an alternative method to the traditional 'pre-post design' that usually relies on the stability of the participants standard of measurement for

the dimension being assessed from one data point to the next¹³. As the learners' perception of the dimension(s) being measured evolves, they readjust the criteria for their self-rating: the response shift bias^{14,15}. When using the RPP method, the ratings of understanding before (referred to as the 'retrospective pre') and after (referred to as the 'retrospective post') the intervention employ the same metric because data are taken at the same point in time, i.e., at the conclusion of training, thus reducing such bias¹⁵. The behavior level (level III) and the results level (level IV) are evaluated by qualitative and quantitative data (open- and closed-ended questions) with trainee faculty after three months and nine months of workshops completion respectively. Results of both Levels III and IV will be interpreted, discussed and diffused in a subsequent paper to be submitted later.

Finally, a specific questionnaire has been developed in collaboration with the Psychiatry Department to study the psychological impact of Beirut's triple blow on the intended faculty development initiative (appendix 3). This 4-point Likert scale questionnaire is composed of three parts: the first part includes direct questions assessing the impacts of COVID-19, of the financial crisis and of the Beirut blast on the daily life of our trainees and of their loved ones; the second and third parts contain indirect questions assessing daily stress and detecting early features of depression. The psychological questionnaire was administered before starting the first session and at the end of the tenth training session to interpret the results of the assessment framework through the lens of Beirut's triple blow's psychological impact.

Pilot study (validity evidence) of the different questionnaires:

Two content experts were involved in developing and reviewing the questionnaires that were pilot tested prior to their implementation on a sample of five faculty members not enrolled in the FDP, making sure they are in line with outcomes being assessed. Physician Examiners that were in charge of course delivery and assessment and Enrolled Trainees were adequately trained prior to FDP administration and given specific guidelines about the questionnaires and rubrics in order to ensure the accuracy and the integrity of the data collected during the response process. The internal structure validity evidence was evaluated by two independent raters whose inter-rater reliability was evaluated by the kappa correlation coefficient that accounts for the random-chance occurrence of rater agreement (Kappa = 0.84). Reliability was evaluated using Cronbach's alpha for internal consistency¹⁶ with a value of 0.89.

Pre-and Post-Workshops Psychological Questionnaire:

- The psychological questionnaire (appendix 3) was administered at the beginning of the FDP prior to workshop I on February 7, 2022, 18 months after the Beirut Blast, 28 months following the start of Lebanon's economic meltdown, and 24 months after Lebanon's first confirmed case of Covid-19.
- All questions whose answers mean was above the two-point cut-off (i.e.: [Considerably, extremely], [somewhat more than usual, much more than usual],

[more than half the days, nearly Every Day]) according to the Likert scale were considered as answers indicating that their authors were significantly affected psychologically by Beirut’s triple blow.

Data was electronically collected via Microsoft Forms (©Microsoft 2022). SPSS version 22 (IBM Corp) was used to analyze the results. Wilcoxon Signed Rank Test was used to analyze results of the surveys administered following each workshop. The Wilcoxon Signed Rank Test was chosen over the t-test due to the non-normal and potentially ordinal nature of the psychological questionnaire data, which often arises from Likert-type scales. Additionally, the Wilcoxon test is more robust to outliers and aptly designed for paired samples, like our pre-post workshop measurements. Significance level was taken at $p < 0.05$. This study was approved by the IRB committees of both SGUB (IRB-RES/O/002-22/0122) and Johns Hopkins University IRB (HIRB00014603) where the first author is currently enrolled in the Master of Education in the Health Professions (MEHP). All participants provided written informed consent prior to enrolment in the study.

Results

There were 20 men (57%) and 15 women (43%) participants in the Faculty Development Program. The participants’ average age was 49 years (range: 30 – 77) and their average job experience was 14 years (range: 1 – 46) (Table 1).

Overall, 77% of all participants found the workshops to be of excellent quality with a mean value of overall satisfaction of the quality of the program of 4.1 ± 0.5 (Table 3).

Pre-workshop psychological questionnaire

Participants demonstrated significant psychological adverse effects from the Beirut triple catastrophe, as indicated by

statistically significant findings ($p < 0.05$) in 7 out of 10 survey items. Responses for the following three items, however, did not reach significance:

1. 'In the past 30 days, how much were you affected by the Aug 4, 2020, explosion: nightmares, fear, trouble concentrating, mood changes?' (Mean score = 1.5)
2. 'During the past week, have you lost confidence in yourself?' (Mean score = 1.6)
3. 'Over the previous two weeks, have you experienced diminished interest or pleasure in activities, or felt down, depressed, or hopeless?' (Mean score = 1.7).

(Table 2).

Kirkpatrick’s level I (Satisfaction questionnaire) results:

- According to the results of the first stage of Kirkpatrick evaluation, the number of participants that said the workshops were of excellent quality was 27 (77%). Out of the 35 participants, 31 (90%) expressed complete satisfaction with the workshop format. In every other section of the questionnaire, more than 50 % of the respondents said the quality was very good.
- We computed the mean and SD for every item of the level I questionnaire for all workshops combined (Table 3). On a scale of 1 to 5, instructor assessment averaged 4.1, course content assessment averaged 4.2, course support assessment averaged 3.9, while the overall assessment of the quality of the workshops averaged 4.1.
- Spearman correlation testing yielded a highly significant correlation ($p=0.00 < 0.05$) as evidenced by the

Table 1. Study population demographics.

| | Variable | Frequency | Percentage/Standard Deviation |
|---------------------|----------|-----------|-------------------------------|
| Gender | Male | 20 | 57% |
| | Female | 15 | 43% |
| | Total | 35 | 100% |
| Age | Mean | 49 | SD=11 |
| | Min | 30 | |
| | Max | 77 | |
| Years of Experience | Mean | 14 | SD=11 |
| | Min | 1 | |
| | Max | 46 | |

Table 2. Pre-workshops psychological questionnaire results.

| | In the past 30 days, how much were you bothered by the Aug 4, 2020 explosion, nightmares, fear, trouble concentrating, mood changes? | In the past year, did you feel that your basic lifestyle had changed (education of children, access to healthcare, grocery shopping) due to financial needs? | How worried are you about getting COVID-19? | How worried are you about infecting your loved ones with COVID-19? | During the past week, have you been over worried? | During the past week, have you felt constantly under stress or strain? | During the past week, have you been able to enjoy your normal day-to-day activities? | During the past week, have you felt that you could not overcome your difficulties? | During the past week, have you lost confidence in yourself? | During the past two weeks, have you felt little interest or pleasure in doing things or felt down, depressed, or hopeless? |
|-------------|--|--|---|--|---|--|--|--|---|--|
| Mean | 1.5 | 2.5 | 2.1 | 2.8 | 2.3 | 2.3 | 2.0 | 2.1 | 1.6 | 1.7 |
| Minimum | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Maximum | 3 | 4 | 4 | 4 | 4 | 4 | 3 | 4 | 3 | 4 |

Table 3. Kirkpatrick's level 1 (Satisfaction questionnaire) results.

| Instructor Assessment | Level of satisfaction (average of 10 modules, Mean \pm SD) | Spearman rho's |
|--|--|-----------------------|
| Academic skillfulness of the instructor | 4.3 +/- 0.42 | 0.82* |
| Lecturing method and the ability to transfer the concepts to learners | 4.1 +/- 0.45 | 0.82** |
| Ability of the instructor in class management | 4.1 +/- 0.42 | 0.72** |
| Use of active teaching methods and engaging the learners | 3.9 +/- 0.46 | 0.69** |
| Ability to respond to the inquiries and questions of learners | 4.2 +/- 0.47 | 0.71** |
| Frequency of using practical examples during teaching | 3.9 +/- 0.62 | 0.78** |
| Course content assessment | Level of satisfaction (average of 10 modules, Mean \pm SD) | Spearman rho's |
| Effectiveness of the contents of the course in increasing your knowledge | 4.1 +/- 0.52 | 0.86** |
| Relationship between training course and your organizational needs as defined by the Faculty Affairs Committee | 3.9 +/- 0.57 | 0.72** |
| Up-to-datedness of the contents of the course | 4.2 +/- 0.47 | 0.92** |
| Quality of content in the training course | 4.0 +/- 0.54 | 0.87** |
| Course support assessment | Level of satisfaction (average of 10 modules, Mean \pm SD) | Spearman rho's |
| Your satisfaction with the duration of the course | 4.0 +/- 0.45 | 0.56** |
| Desirability of educational location and environment | 3.7 +/- 0.63 | 0.62** |
| Quality of lighting in the classes | 3.9 +/- 0.51 | 0.66** |
| Ventilation and adequacy of cooling/heating system | 3.3 +/- 0.94 | 0.49** |
| Treatment of instructors toward you | 4.4 +/- 0.44 | 0.78** |
| Overall satisfaction | Level of satisfaction (average of 10 modules, Mean \pm SD) | Spearman rho's |
| Satisfaction with the quality of workshops | 4.1 +/- 0.47 | - |
| Satisfaction with the way of conducting workshops | 4.1 +/- 0.64 | 0.91** |

high value of the R coefficient between the rank of each workshop in item "Satisfaction with the quality of workshop" and the rank of each workshop in the rest of the items (Table 2).

Kirkpatrick's level 2 (Learning questionnaires) results:

At the end of each module, participants were administered three questionnaires.

- The mean percentage of correct answers to the first questionnaire (that includes 10 to 15 multiple choice questions (MCQs) directly related to each workshop's content (workshops 1 to 9, workshop 10 not included) thus directly testing post-session cognitive learning), was 76% ranging from 65% (workshop 3) to 88% (Workshop 2) (SD=7.7) (Table 4)
- The mean result for the Retrospective Pre questionnaire of all workshops averaged 2.3 SD=0.57 (Scale 1 to 5) while the mean result for the Post questionnaire

of all workshops increased to 3.6 SD=0.50 (scale 1 to 5) ($p<0.05$) (Table 5). Moreover, for every workshop, the increase of the score between the Retrospective Pre and Post questionnaires was significant ($p<0.05$) (Table 5).

Post-Workshops Psychological Questionnaire results show there successful learning despite the economical and psycho-social challenges (Table 6).

Comparison between Pre and Post workshops psychological questionnaires show there is no statistically significant difference in the psychological status of the trainees as assessed by our psychological questionnaire prior to and after FDP administration, indicating that the effects of Beirut's triple blow were still affecting most of our participants with the same intensity six months after having started the workshops (Table 7). A majority of faculty (55%) were markedly affected by Beirut's triple blow with a mean score of 2.1 SD=0.54 at the pre-FDP

Table 4. Kirkpatrick’s level 2 (MCQ Learning questionnaires) results.

| Level II Results | (Mean % of Correct answers) | Standard Deviation (SD) |
|------------------------|-----------------------------|-------------------------|
| Workshop 1 | 79 | SD=8.6 |
| Workshop 2 | 88 | SD=14 |
| Workshop 3 | 65 | SD=13 |
| Workshop 4 | 70 | SD=13 |
| Workshop 5 | 66 | SD=17 |
| Workshop 6 | 84 | SD=9.9 |
| Workshop 7 | 77 | SD= 12 |
| Workshop 8 | 68 | SD=17 |
| Workshop 9 | 85 | SD=11 |
| Workshop 10 | (Does not apply) | (Does not apply) |
| Total Workshops | 76 | 7.7 |

Table 5. Kirkpatrick’s level 2 (RPP questionnaires) results.

| | Retrospective Pre-Q | Post-Q | Wilcoxon Signed Rank Test |
|-----------------|---------------------|----------------|---------------------------|
| Workshop 1 | 2.5 | 3.3 | Z=-3.9 p<0.05 |
| Workshop 2 | 1.7 | 4.1 | Z=-3.9 p<0.05 |
| Workshop 3 | 2.8 | 3.8 | Z=-4.1 p<0.05 |
| Workshop 4 | 1.7 | 3.8 | Z=-4.1 p<0.05 |
| Workshop 5 | 2.9 | 3.4 | Z=-4.0 p<0.05 |
| Workshop 6 | 1.9 | 4.1 | Z=-4.1 p<0.05 |
| Workshop 7 | 1.9 | 3.8 | Z=-3.9 p<0.05 |
| Workshop 8 | 2.3 | 2.9 | Z=-3.2 p<0.05 |
| Workshop 9 | 1.9 | 3.4 | Z=-3.4 p<0.05 |
| Workshop 10 | Does not apply | Does not apply | Does not apply |
| Total Workshops | 2.3 | 3.6 | Z=-5.4 p<0.05 |

psychological questionnaire and a mean score of 2.1 SD=0.32 at the post-FDP psychological questionnaire.

Assessment framework results through the lens of Beirut’s triple blow’s psychological impact:

We computed a variable entitled “Pre-Workshops Mean Psychological questionnaire” corresponding to the mean of the answers to the 10 questions of our psychological questionnaire.

- *Kirkpatrick’s level I questionnaire:* a significant negative relationship (p<0.05) between the score of the psychological questionnaire and the satisfaction with the quality of the workshops (p=0.00<0.05), and with the way of conducting the workshops (p=0.00<0.05). The more psychologically affected the participants are, the lower is their overall satisfaction with the workshops.

Table 6. Post-Workshops Psychological Questionnaire results.

| | In the past 30 days, how much were you bothered by the Aug 4, 2020 explosion: nightmares, fear, trouble concentrating, mood changes? | In the past year, did you feel that your basic lifestyle had changed (education of children, access to healthcare, grocery shopping) due to financial needs? | How worried are you about getting COVID-19? | How worried are you about infecting your loved ones with COVID-19? | During the past week, have you been over worried? | During the past week, have you felt constantly under stress or strain? | During the past week, have you been able to enjoy your normal day-to-day activities? | During the past week, have you felt that you could not overcome your difficulties? | During the past week, have you lost confidence in yourself? | During the past two weeks, have you felt little interest or pleasure in doing things or felt down, depressed, or hopeless? |
|-------------|--|--|---|--|---|--|--|--|---|--|
| Mean | 1.4 | 2.7 | 2.2 | 3.0 | 2.1 | 2.3 | 2.2 | 2.0 | 1.6 | 1.4 |
| Min | 1 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 1 |
| Max | 3 | 4 | 4 | 4 | 3 | 4 | 4 | 4 | 3 | 4 |

Table 7. Comparison between pre and post workshops psychological questionnaires.

| | In the past 30 days, how much were you bothered by the Aug 4, 2020 explosion: nightmares, fear, trouble concentrating, mood changes? | In the past year, did you feel that your basic lifestyle had changed (education of children, access to healthcare, grocery shopping) due to financial needs? | How worried are you about getting COVID-19? | How worried are you about infecting your loved ones with COVID-19? | During the past week, have you been over worried? | During the past week, have you felt constantly under stress or strain? | During the past week, have you been able to enjoy your normal day-to-day activities? | During the past week, have you felt that you could not overcome your difficulties? | During the past week, have you lost confidence in yourself? | During the past two weeks, have you felt little interest or pleasure in doing things or felt down, depressed, or hopeless? |
|----------------------------------|--|--|---|--|---|--|--|--|---|--|
| Pre-workshop | Mean 1.5 | 2.5 | 2.1 | 2.8 | 2.3 | 2.3 | 2.0 | 2.1 | 1.6 | 1.7 |
| | Min 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| | Max 3 | 4 | 4 | 4 | 4 | 4 | 3 | 4 | 3 | 4 |
| Post-Workshop | Mean 1.4 | 2.7 | 2.2 | 3.0 | 2.1 | 2.3 | 2.2 | 2.0 | 1.6 | 1.4 |
| | Min 1 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 1 |
| | Max 3 | 4 | 4 | 4 | 3 | 4 | 4 | 4 | 3 | 4 |
| Wilcoxon Signed Rank Test | Z 0.00 | -1.9 | -0.6 | -1.0 | -1.3 | -0.55 | -0.38 | -1.6 | 0.00 | -0.45 |
| | Asymp. Sig. (2-tailed) 1.0 | 0.06 | 0.53 | 0.32 | 0.18 | 0.58 | 0.71 | 0.10 | 1.0 | 0.66 |

- *Kirkpatrick's Level II Questionnaire:*
- *MCQs results:*
- Comparing the mean percentage of correct answers to all Level II workshops' MCQs with the Pre-Workshops Mean Psychological questionnaire score yielded also a highly significant negative relationship ($p=0.00<0.05$). The more psychologically affected the participants are, the lower is their performance in answering the cognitive MCQs in all workshops. ($p=0.00<0.05$)
- *Self-assessment questionnaires (RPP):*
- (1) The psychological status of the participants does not affect their Retrospective Pre-self-assessment regarding their potential performance in one of the workshops' topics ($p=0.35>0.05$).
- (2) The more psychologically affected the participants are, the lower is their self-assessment in the Post questionnaires of all workshops regarding their potential performance in one of the workshops' topics ($p=0.00<0.05$). In other words, trainees that are less affected psychologically are more likely to benefit from the FDP.

Discussion

This study showed a marked boost in trainees' self-awareness, confidence, and their adeptness to new instructional strategies post-intervention. These faculty development programs are known to enhance teaching effectiveness in standard medical education settings¹⁻⁷.

These programs remain a prominent topic in medical literature, designed to enhance the skills and knowledge of faculty members, subsequently improving the overall quality of medical education¹⁻⁷. They come in various formats, from brief workshops and seminars to comprehensive long-term degree courses. Their content encompasses a wide range of subjects, including curriculum design, instructional strategies, assessment strategies, leadership, research methods, and the integration of technology. In terms of duration, some are concise, lasting just a few days, while others can extend over several years. The COVID-19 pandemic has seen many of these programs transition to online platforms⁸, although some have adopted a blended approach¹⁷. Regardless of the format or content, continuous evaluation and feedback are crucial components, ensuring the programs remain effective and up to date.

The initiation of SGUB FM's program occurred amidst a backdrop of significant upheaval in Beirut, marked by socio-political turmoil, economic downturn, and the devastating 2020 port explosion. This unique context not only sets Beirut's medical faculty's challenges apart from their global counterparts but also underscores their resilience. Indeed, these unparalleled events in Beirut lend additional weight and significance to the outcomes of our study.

Limitations of the Study: While this study offers valuable insights, it's crucial to acknowledge its limitations. Firstly, the sample size was relatively small, limiting the generalizability of the findings. Additionally, the study primarily relied on self-reported data, which may introduce response bias. The external circumstances, including Beirut's triple blow, created a unique context that might not be fully replicable in other settings. Furthermore, the evaluation was limited to Kirkpatrick's Levels I and II, and future studies should explore Levels III and IV to provide a more comprehensive assessment of the program's impact.

Similar studies conducted in the realm of faculty development in medical education have shown satisfaction levels of 63%¹⁸. The mean value of overall satisfaction for a whole FDP program ranged from 3.6 ± 0.50 (Kim, 2015)¹⁹ to 4.2 ± 0.32 on a 4-point Likert scale. To assess the impact of our FDP, we employed a specifically designed psychological questionnaire in conjunction with Kirkpatrick's evaluation framework, chosen for its simplicity and ease of application¹².

It's worth noting that the effects of Beirut's triple blow continued to impact most of our trainees with the same intensity even six months after commencing the workshops. This is evident in the absence of a statistically significant difference between the results of the psychological questionnaire administered before and after the 10 workshops.

Level II results (learning) indicate that the mean percentage of correct answers to the nine post-workshop MCQs is 76%. Additionally, the mean results for the RPP questionnaires of all workshops improved significantly from 2.3 (SD=0.57) to 3.6 (SD=0.50) on a 5-point scale ($p<0.05$). Previous studies, such as Heydari (2019)¹⁸ and Steinert (2016)⁷, have also demonstrated significant improvement in Level II pertaining to knowledge and skills.

When interpreting the results of Kirkpatrick's Levels I and II alongside the psychological questionnaire, a notable pattern emerges. Trainees experiencing higher psychological distress, as indicated by a high mean psychological score, tend to exhibit lower post-workshop satisfaction and reduced performance, as evidenced by decreased scores in cognitive MCQs and the Post questionnaire of the RPP framework.

Implications for Future Faculty Development Initiatives:

These findings hold significant implications for shaping future faculty development initiatives. Firstly, they underscore the importance of considering contextual factors and the psychological well-being of trainees when designing and implementing such programs. Faculty development initiatives should incorporate strategies to address trainees' emotional well-being, particularly in challenging or crisis-prone environments.

Additionally, the study's results will inform the design and assessment of future faculty development initiatives. Understanding the impact of training on Kirkpatrick's Levels I and

II provides a foundation for evaluating effectiveness. Future research should delve into Levels III and IV, focusing on behavioral change and organizational impact, to provide a more comprehensive view of program outcomes.

Moreover, given the unique context of Beirut's triple blow and its lasting effects on trainees, future initiatives should include proactive measures to support faculty members' mental and emotional well-being. Proven strategies such as stress coping mechanisms, emotional support, and regular communication from top management should be integrated into program planning^{20–22}.

Conclusion

In conclusion, while recognizing the study's limitations, these findings will serve as a valuable guide for developing more resilient and effective faculty development programs that can thrive even in challenging circumstances. The study's distinctiveness lies in its ability to illuminate the interplay between trainees' psychological status and their performance, set against the backdrop of Beirut's crises, as assessed by the Kirkpatrick's evaluation framework. Furthermore, it underscores the potential for significant learning amidst stress and uncertainty, particularly in resilient trainees embedded in a country familiar with turmoil. Drawing upon global practices and contextualizing them to Beirut's unique challenges, the lessons learned from this study will contribute significantly to

the continuous enhancement of faculty development initiatives worldwide.

Data availability

Underlying data

Figshare: Faculty Development, <https://doi.org/10.6084/m9.figshare.21803820.v2>²³.

This project contains the following underlying data:

- FD 1 TO 10 Final.sav

Extended data

Figshare: Faculty Development Appendices, <https://doi.org/10.6084/m9.figshare.21975572.v1>²⁴.

This project contains the following extended data:

- Faculty Development Appendices

Data are available under the terms of the Creative Commons Attribution 4.0 International license (CC-BY 4.0).

Acknowledgements

The authors would like to extend their respect to the faculty that showed readiness and enthusiasm to participate in the Faculty Development Program in an effort to improve Medical Education outcome despite all challenges faced.

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Open Peer Review

Current Peer Review Status:  

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Reviewer Report 01 February 2024

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Toni Ungaretti 

School of Education, Johns Hopkins, Baltimore, MD, USA

Successful implementation of Medical Education Faculty Development Project at Saint George University of Beirut in the immediate post triple blow to Beirut

Nehme A, Btaiche R, Jreij M, Jahjah J, Karam G and Belcher A

Comments

This is a review of the revised manuscript. The manuscript presents the examination of the impact of an innovative faculty development program that was implemented after the experience of the destabilization of the banking system, the COVID-19 pandemic, and the Beirut Explosion in 2020. The revised iteration of the manuscript provides additional detail and clarification that address identified needs in the original submission. It more effectively reflects the authors' work and attention to detail that is indicated in the study outcome. It makes a contribution to global faculty development initiatives.

Introduction

The revised introduction both captures and focuses attention on the importance of this issue. The citations of faculty development studies and especially those in disruption provide a stronger context for the study. Additional explanation and citations focused on psychological factors strengthen the context for the focus of this study. The authors might want to include detailed descriptions of the severe external disruptions related to the facilities, persons, processes, and procedures to set the foundation for the importance of this study. This coupled with the effort to seek accreditation and transform faculty development make this study unique in its contribution to knowledge. The authors might want to consider that descriptions such as "venerable", "...a beacon of medical excellence since 1878", and Avante-garde be provided with additional detail to give context (important to this work) to their meaning.

Methods

Study population

Demographics such as early, mid, and late career stage would be a useful addition as a lens to

review the data. Information on this would help determine if there is a need to differentiate the curriculum based on experience.

Settings and Study Design

This section is much improved as it includes important details that add strength to the study and a clearer picture to guide replication. An example of a typical session would provide further insight into the structure of the intervention. It would illustrate the emphasis on the two primary components, teaching methodologies and assessment techniques. In Program Modules, the breakdown of the methods into the specific sessions with headings provides clear organization. Given that the reflection workshop is the emphasis of the last module, it would help the readers to have an explanation of how this skill is woven through the various sessions. The use of trained facilitators is commendable and addresses issues related to teaching approaches.

The inclusion of the Psychiatry Department provides an interprofessional collaborative model that can inform future work of similar studies. The use of the retrospective pre-post method is an interesting choice with a literature base to support its use for this type of study. The authors effectively use Kirkpatrick's Evaluation Model and note that future research will address Levels III and IV of this model. It is a challenge to show change at levels III and IV, so the second paper will be a welcome addition to the literature. The inclusion of a pilot study strengthens the impact of this work. Additional information to support the validation of the questionnaires is included. Steps have been taken to check for validity.

Results

The results section is organized and detailed. The tables clearly convey the results. Limiting the use of the term "significant" to indicate p-value would eliminate any confusion. The authors might want to report the results under Kirkpatrick's level I as "27/31 (77%)" to make it clearer to the reader.

Discussion

The Discussion presents clearer details and relates them more effectively to the introduction and the findings with accompanying citations to extend the impact of this work. This revision strengthens the study and will be a guide to future researchers. The authors should be commended for the extensive discussion on limitations and their inclusion of research related to this work. The implications of this study follow from the introduction and the findings.

Conclusion

The conclusion aligns this effort with global faculty development initiatives and research agendas.

Competing Interests: No competing interests were disclosed.

Reviewer Expertise: Qualitative, quantitative, and mixed methods

I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard.

Reviewer Report 24 November 2023

<https://doi.org/10.21956/mep.21345.r35219>

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Ardi Findyartini

Universitas Indonesia, Depok, West Java, Indonesia

I would like to highlight that I am fine with the revision.

Competing Interests: No competing interests were disclosed.

I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard.

Version 1

Reviewer Report 27 June 2023

<https://doi.org/10.21956/mep.20912.r33394>

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Ardi Findyartini

Universitas Indonesia, Depok, West Java, Indonesia

The article titled 'Successful implementation of Medical Education Faculty Development Project at Saint George University of Beirut in the immediate post triple blow to Beirut' elaborates a significant attempt to provide adequate support through faculty development program (mainly workshops) for the faculty in the medical school in challenging circumstances. While such an effort is highly appreciated, I find this article is quite hard to follow and I cannot recommend further publication until it is substantially revised.

Introduction:

The current introduction explained the context of the medical school without highlighting current literature on faculty development efforts in different medical schools around the world during the challenging circumstances (including COVID-19, limited resources, etc). It is recommended that the authors also explain the scope of faculty development better by incorporating key literature on faculty development (e.g. Steinert *et al.*, 2014, Steinert *et al.*, 2017 - BEME Guide no 40, etc), to later on place the current faculty development initiative better. The authors have used relevant literature in the discussion section, but did not elaborate on them well in the introduction. The introduction should also add the literature on the influence of psychological condition of the faculty towards the effectiveness of faculty development. Overall, the current introduction is still lacking a systematic analysis of the gap in the literature on faculty development in specific

circumstances and rationale on why this study hence is important for readers. A clearer research question is also warranted.

Methods:

The study setting as elaborated in the current introduction can be considered to be moved in the study setting in the methods section. The authors should elaborate on the medical school curriculum context in which the faculty enact their roles as teachers, as well as the faculty development program available before the present intervention is in place.

The use of Kirkpatrick's framework is appropriate. The instruments to measure the satisfaction and knowledge of the workshop participants were fairly explained.

The description of the intervention should be more detailed. It is not adequate to just explain that the intervention is workshop, with selected topics. How was the workshop done? Who lead the workshop? What was the method for the workshop? Were there any activities following the workshops, etc. The authors might consider underlining the rationale of selecting workshops as a strategy in the current faculty development program. In other words, the explanation on validity of the tools being used in this study should be added with the 'validity' or trustworthiness of the workshops, hence the authors may provide both evidence on the effectiveness of the workshop and how and why the workshops were done.

Results:

The results are quite compelling and well described. With further requirement to revise the introduction and methods section, it is sometimes quite challenging to grasp the meaning of the results.

Discussion:

The authors have elaborated the main findings and provided reasoning using relevant literature. The discussion section however still requires further work. I would recommend the authors do not only discuss the level of satisfaction and knowledge, yet how the faculty development programs in the different literature were completed and in what circumstances. Given that the authors aim to highlight the special circumstances of faculty development program they have conducted in Beirut, discussing the contexts of different studies and how they are relevant with this present study is critical. Herewith, it is expected that the authors may elaborate further recommendations or impacts of this study in others settings, as well as specify the limitation of the present study better.

Conclusion:

The conclusion is fair. Yet, clearer research questions/evaluation questions elaborated in the introduction should be able to strengthen the conclusion.

Is the work clearly and accurately presented and does it cite the current literature?

Partly

Is the study design appropriate and is the work technically sound?

Partly

Are sufficient details of methods and analysis provided to allow replication by others?

Partly

If applicable, is the statistical analysis and its interpretation appropriate?

I cannot comment. A qualified statistician is required.

Have any limitations of the research been acknowledged?

No

Are all the source data underlying the results available to ensure full reproducibility?

Yes

Are the conclusions drawn adequately supported by the results?

Partly

Competing Interests: No competing interests were disclosed.

I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard, however I have significant reservations, as outlined above.

Author Response 28 Sep 2023

Marc Jreij

Dear Dr. Ungaretti,

I would like to express my gratitude for your thorough review and constructive feedback on our manuscript submitted to MedEdPublish. Your insights have been invaluable in refining our paper. Please find below a summary of the changes made in response to your comments:

Introduction:

1. The opening has been revised for a more compelling introduction.
2. The consideration of including the psychological impact on faculty in the aim has been incorporated.

Methods: Study Population: No changes were required as the description was deemed adequate.

Settings and Study Design:

1. Clarification has been provided for the first sentence, explaining the underlined phrase regarding the Faculty Development Program (FDP).
2. Additional details on the instruments and their intended purpose have been incorporated for improved clarity.
3. The application of Kirkpatrick's Levels 1 and 2 remains unchanged due to your affirmation.
4. Consistency has been ensured in terms used to describe different roles. Definitions and distinctions have been provided between terms like content experts, Physician Examiners, faculty, and trainees.
5. We have retained the description of the data collection and analysis process for the Pre-Workshop Psychological Questionnaires, as they were clear and had IRB approval.

Results:

1. The presentation of results in tables remains unchanged.
2. Statements of results have been clarified, and the term 'significantly' has been rephrased as suggested.
3. Rationale for the application of the Wilcoxon Signed Rank Test over a t-test for the pre-post workshop psychological questionnaire results has been provided.
4. MCQ results and Self-assessment questionnaires have been updated to report the p-value and the term "highly significant" has been omitted.

Discussion:

1. The last paragraph has been revised to better align with the findings and to ensure a clear connection with the core results of the study.
2. We've identified and included the limitations of the study.
3. A section has been added on how these results will be leveraged to shape future faculty development initiatives.

In addition to your feedback, we have also integrated suggestions from other reviewers to produce a more polished and robust manuscript. I believe that these revisions have substantially improved the quality and clarity of our work. Once again, I appreciate your time and expertise in reviewing our manuscript. Looking forward to your continued support and feedback.

Warm regards,

Competing Interests: No competing interests were disclosed.

Author Response 28 Sep 2023

Marc Jreij

Dear Dr. Findyartini,

I sincerely appreciate the time and effort you have invested in reviewing our manuscript submitted to MedEdPublish. Your detailed feedback has provided us with a roadmap for essential revisions to enhance the quality and clarity of our work. Here's a summary of the modifications made in response to your feedback:

Introduction:

1. The introduction has been revised to incorporate a more in-depth exploration of current literature on faculty development efforts in various medical schools worldwide, particularly during challenging times such as the COVID-19 pandemic and resource limitations.
2. An elaboration on the psychological condition of faculty and its influence on the effectiveness of faculty development has been included.
3. A systematic analysis of the gap in the literature concerning faculty development in specific situations has been added to underline the significance and rationale of our study.
4. The research question has been clarified and emphasized to provide readers with a clear direction of our study's focus.

Methods:

1. As suggested, we further elaborated on the medical school curriculum context.
2. We've provided a detailed description of the pre-existing faculty development programs before introducing our initiative.
3. A comprehensive breakdown of the intervention, specifically the workshops, has been provided. This includes information about how the workshop was conducted, who led it, its methodology, and post-workshop activities. Further, we elucidated the rationale behind selecting workshops as our faculty development strategy.
4. The validity of the tools and the trustworthiness of the workshops have been expanded upon, providing a solid foundation for our research methodology. Results: While you found the results to be compelling, we have made slight modifications to ensure consistency and clarity, especially given the changes in the introduction and methods sections.

Discussion:

1. We have incorporated a more in-depth discussion of the contexts of various faculty development programs found in the literature, emphasizing the circumstances under which they were conducted.
2. Drawing parallels between our study and others in terms of context, we've highlighted the uniqueness of our faculty development program in Beirut.
3. Based on your feedback, we've provided more detailed recommendations and implications of our study for other settings and refined the limitations section for clarity.

Conclusion: The conclusion has been restructured.

In addition to your insightful comments, we've also taken into account suggestions from other reviewers. Collectively, these changes have significantly elevated the overall quality and impact of our manuscript. Again, thank you for your constructive feedback. I hope that our revisions meet your expectations and I look forward to hearing your thoughts on the modified manuscript.

Competing Interests: No competing interests were disclosed.

Reviewer Report 30 March 2023

<https://doi.org/10.21956/mep.20912.r32980>

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Toni Ungaretti

School of Education, Johns Hopkins, Baltimore, MD, USA

Comments:

This study examines faculty development outcomes under disruptive situations and contributes a unique perspective to this discourse. A few adjustments would strengthen this work. Consider having the manuscript edited to communicate this work more effectively to readers.

Introduction:

The opening sentence needs to capture the attention of the reader. The first two sentences in the third paragraph of the Introduction can be used to create a compelling introduction: "Most faculty development initiatives have been tested in different settings, whether in the United States or abroad, and have proved their efficacy in improving teaching effectiveness in medical education¹⁻⁷; however, such initiatives have still not yet been studied when applied in a combination of exceptional circumstances".

This entire second paragraph makes a much stronger opening paragraph for this paper.

Is there an interest in including in the aim the psychological impact on the faculty in keeping with the psychological measures used with the faculty?

Methods:**Study Population:**

The description is adequate.

Settings and Study Design:

- The first sentence is not clear. Explain what is meant by the underlined phrase: "This is an interventional study where the proposed pilot Faculty Development Program (FDP), is designed under the auspices of student/learner-centered classes with the following modules...".
- The study includes a clear and thorough explanation (supported by citations) plus an accurate application of the retrospective pre-post method.
- Additional information on the instruments and their intent would make this easier for the reader to follow.
- The application of Kirkpatrick's Levels 1 and 2 is accurate and clear.
- Validity and reliability procedures are included. The questionnaires (including the psychological questionnaires) were developed by two content experts and piloted by five faculty.

Pilot Study:

- The terms used to describe different roles need to be consistent. It is not clear whether the terms *content experts* and *Physician Examiners* refer to the same group of people. The same issue applies to the terms *faculty* and *trainees*.
- The psychometrics on validity and reliability are reported.

Pre-workshops Psychological Questionnaires:

- The Likert scale indicators should be clearly discrete.
- The description of the data collection and analysis process for the Pre-Workshop Psychological Questionnaires is clear. IRB approval was obtained.

Results:

- Tables clearly display results.
- Provide clearer statements of results. It might help to replace the adjective 'significantly' to avoid confusion about the significance of the findings. An example is in the first sentence of the results of the pre-workshop psychological questionnaire. Instead, report that 7 of 10 questions were significant at $p < 0.05$.
- Kirkpatrick's Level I (Satisfaction questionnaire) and Level II (Learning questionnaires) results are clearly presented.
- Provide the rationale for using the Wilcoxon Signed Rank Test rather than a t-test to compare the pre-post workshop psychological questionnaire results.
- Interpretations of the results are more appropriate in the Discussion rather than in the Results section.
- MCQ results and Self-assessment questionnaires - Report the p-value and omit "highly significant." The comparison of these is a critical component of this study

Discussion:

- Explain how the last paragraph of the discussion section relates to the findings as it appears to introduce additional variables.
- Limitations of the study need to be identified.
- How will these results be used to inform future faculty development initiatives?

References:

- References are accurate and appropriate.

Is the work clearly and accurately presented and does it cite the current literature?

Yes

Is the study design appropriate and is the work technically sound?

Yes

Are sufficient details of methods and analysis provided to allow replication by others?

Partly

If applicable, is the statistical analysis and its interpretation appropriate?

Partly

Have any limitations of the research been acknowledged?

No

Are all the source data underlying the results available to ensure full reproducibility?

Yes

Are the conclusions drawn adequately supported by the results?

Yes

Competing Interests: I direct the program in which one of the authors (Alexandre Nehme) is enrolled. He took a course I co-taught several years ago. I confirm that this potential conflict of interest did not affect my ability to write an objective and unbiased review of the article.

Reviewer Expertise: Qualitative, quantitative, and mixed methods

I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard, however I have significant reservations, as outlined above.

Comments on this article

Version 2

Reader Comment 07 Nov 2023

Balaji Arumugam , Community medicine, TN. Dr. MGR Medical University, AMCH, Tiruvannamalai, India

The Kirkpatrick Model is a globally recognized method of evaluating the results of training and learning programs. It assesses both formal and informal training methods and rates them against four levels of criteria: reaction, learning, behavior, and results. The above model is an internationally accepted validated evaluation method for assessment of any training programs. This model was properly scientifically utilized among 35 FDP attendees by the authors especially on level 1 and 2. The Kirkpatrick's assessment model, in combination with a specifically designed psychological questionnaire, were chosen to assess the effectiveness of the faculty development initiative. The study results explored a wonderful subjective as well as the objective results. 77% of all participants found the workshops to be of excellent quality (Kirkpatrick's Level I). Moreover, Kirkpatrick's level II results yielded a 76% mean percentage of correct answers to post-workshops MCQs and a significant improvement in the mean results of the self-assessment questionnaires, administered before and after each workshop. This study was able to highlight that significant learning can occur amidst exceptional circumstances. Congratulations to all the authors and stakeholders involved in making this research study on faculty development programme which will be a role model study for our Indian set up where we have started gaining importance for FDP under NMC guidelines.

Competing Interests: NIL
