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The first life skills intervention to enhance well-being amongst university students in the Arab world: 'Khotwa' pilot study

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Abstract

Although Life Skills programs showed to improve the psychological and physical wellbeing of individuals, little attention has been paid, worldwide and in the Arab countries in specific to implementing life skills intervention for university students. In this study, we tested the effectiveness of a life skills based health promotion intervention KHOTWA (STEP) in enhancing the wellbeing of university students in Lebanon, a country that faces economic and political instability. This is a quasi-experimental study, with pre and post-test, intervention-control design. Each group was formed of 78 participants studying in a private university in Lebanon. Mixed design was used to address the process and outcomes objectives of the intervention. The program was carried online due to COVID-19 pandemic. Significant differences were observed between the intervention and the control groups for life skills, dietary habits and mental health scores at the 3-month follow-up. For the intervention group, a significant increase was observed in the mean score of each of the following Life Skills subscales: self-care ($p = 0.001$), work and study ($p = 0.013$), career and education planning ($p = 0.011$) and looking forward/goal settings ($p < 0.001$). Students also achieved a healthier eating habit compared to those in the control group by decreasing their consumption of processed food. There was no significant effect in terms of body mass index ($p = 0.827$). Also, there was a significant change in the mental health status ($p = 0.012$) only in the intervention group as its mean score decreased after 3 months of the intervention implementation. This intervention enhances the mental health and promotes healthy habits leading consequently to a better quality of life and more productivity amongst university students. Therefore, such interventions should be replicated in other similar context to improve university students' well-being.

Keywords

anxiety, BMI, eating behaviour, health behaviour, health promotion, mental illness, well-being, youth

Significance of the study

This study highlights how a life skills (LS) curriculum infused in a university program in a developing country plays a crucial role in enhancing the wellbeing of university students. Lebanon is facing multiple crisis; financial, political in addition to the COVID-19 pandemic, therefore a lot of stressors are being faced by young adults especially university students who should be well prepared to join the labour market. Despite their proven effectiveness in enhancing mental wellbeing and healthy lifestyle amongst

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young adults. LS programs have never been implemented in the educational system in contexts similar to the Lebanese context. Our results showed the effectiveness of a LS program in improving university students' well-being in this context. The results identify practices that are perceived as generally helpful to be scaled up at the national and international levels.

Introduction

The notion of life skills (LS) has gained momentum over the past few years. The importance of LS continues to receive increasing recognition for their valuable contribution to improving the psychological and physical wellbeing of those who are impacted by multiple social and environmental factors (Cronin and Allen, 2017). For instance, Lebanon has been suffering from a corrupted political system that over the last few years, has led to major social and economic challenges. As a result, the Lebanese people are undergoing financial and educational hardships, such as challenges of enrolling in university, and are highly vulnerable to mental and physical disorders (Obeid et al., 2020). The high number of Syrian refugees has resulted in increased unemployment rates and xenophobic attitudes amongst Lebanese people (Obeid et al., 2020). Furthermore, more than 50% of the Lebanese population have been confronted with traumatic events related to war (Karam et al., 2006); thus suggesting that mental ill-health and poor psychological wellbeing may be high within this population. This percentage is expected to further increase due to many factors, including the unstable political situation, high risk of terrorist attacks, lack of clean water, high unemployment rate, electricity shortage and improper waste disposal (World Bank [WB], 2016). The mental and physical health of the Lebanese continue to be at risk, especially that of university students (Zeeni et al., 2018).

As social and living conditions of university students globally is more challenging with a complex set of the before mentioned factors that play a role in determining their lifestyle and hence their health status, it is fundamental that they are equipped with LS in order to improve coping mechanisms and to negotiate life's challenges (Esmaeilinasab et al., 2011). Previous LS intervention programs have been initiated in educational settings, in both developed and developing countries. However, LS programs have never been implemented in the educational system of any Arab country in general, nor in Lebanon in specific.

University settings have a great impact on various aspects of students' lives, including academics, health services, social networks and extracurricular activities. LS encompass a broad number of domains, including: teamwork (team building and leadership; goal setting (how to achieve a dream/goal, searching and succeeding in a job); management skills (time management, stress management, food and nutrition management, money and house management) interpersonal communication (effective communications); problem-solving and decision making (such as conflict resolution, and negotiation); emotional, social and leadership skills such as building trust, self esteem, self-motivation, positive thinking, volunteering and collective strengths and self-care) (Cronin and Allen, 2017). It has previously been shown that LS curricula play a pivotal role in the promotion of positive transition-related health outcomes amongst youth (Alwell and Cobb, 2009). LS are regarded as one of the most crucial interventions as they enhance youth quality of life, educational attainment and future economic prosperity (Bailey et al., 2009). For instance, Shek and Sun (2012) found that the implementation of a leadership intervention (interventions that influence participants' behaviours and attitudes towards adopting healthy decisions and practices (Ipsen et al., 2018)), amongst university students, resulted in the adoption of healthy behaviours and improved psychological well-being. Similarly, Savoji and Ganji (2013) demonstrated that a life skills training (LST) program is effective in enhancing university students' mental health. Whilst universities are responsible for promoting the well-being and quality of life of its students, there is a clear scarcity in the literature regarding life skills interventions tackling university students especially in developing contexts (Savoji and Ganji, 2013).

Successful interventions can be transferred across multiple campuses with the aim of reaching a high number of the target audience (Mowbray et al., 2006). Previous LS programs pertaining to mental health have been found to have the greatest impact amongst high school students; decreasing substance abuse, smoking and alcohol intake; while increasing healthy habits and self-esteem. These programs used a model of health (physical, emotional and social health) to design their curriculum (Bharath and Kumar, 2008). In other words, the implementation of LS programs focusing on mental models, self-care and effective communications and interpersonal skills, nutrition, housing, money, goal settings and self-esteem tackling schools' students mental health and substance abuse lead to positive mental and physical outcomes including the significant decrease in negative coping behaviours (Botvin et al., 2001; Meng et al., 2018; Menrath et al., 2012; Thompson et al., 2012; Vicary et al., 2004; Weichold and Blumenthal, 2016). Furthermore, such programs have been shown to increase health knowledge and attitudes, assertiveness, self-control, confidence and satisfaction; and a reduction in social anxiety amongst pupils (Weichold and Blumenthal, 2016). UNICEF conducted a review of country documentation on LS evaluation from its 40 country offices to assess the relevance, coverage, efficiency, effectiveness and sustainability of LS initiatives (UNICEF, 2012). Results indicated that although the LS program became imbedded in some national education systems; academic institutions tend to squeeze it into the curriculum, without paying the topic full attention.

The societal conditions in Lebanon place young adults, who are attending university to ultimately enter the work force and establish their own productive adult lives, at risk of a variety of negative outcomes – including negative physical and mental outcome. Therefore, the implementation of a LS intervention in Lebanese universities, and within the wider educational system is a necessity to increase students' abilities to physically and emotionally navigate the challenging Lebanese social, economic, political and natural environments.

A study conducted by Musharrafieh et al. (2008) showed that the low prevalence of physical exercise amongst Lebanese university students, which is leading to an increase in obesity and sedentary life, should be addressed by designing life skill-based interventions. Nonetheless, in Lebanon, there is an absence of university-based interventions related to physical and mental health (Zeeni et al., 2018). In fact, most of the LS programs that are related to people's mental health are tailored and limited to refugees. For example, the Adolescents Health and Life Skills Education program educated young refugees about health and LS to improve their mental health and develop their professional skills (Medical Aid for Palestinians, 2018). Thus, an appropriate health promotion strategy is needed to address Lebanese young adults' lifestyle behaviours, including their physical activity and dietary intake to reduce obesity and its physical and psychosocial comorbidities (Habib-Mourad and Ghandour, 2015; Musharrafieh et al., 2008; Salameh et al., 2014).

Given the little attention that has been paid to implementing Life Skills programs at university levels in addition to the scarcity in such programs in context of developing countries such Lebanon, this study aims to test the effectiveness of a life skills based intervention in enhancing the body mass index and mental health amongst Lebanese university students, the 'Khotwa' (step) program. The authors developed this intervention based on the ecological model to address the seven competencies mentioned by the Casey Family Programs (CLS, 2012); Daily Living, Self-Care, Relationships and Communication, Housing and Money Management, Work and Study, Career and Education Planning, Looking Forward. It is a planning approach that aims at creating and maintaining healthy lifestyles and conditions through the development of knowledge, attitudes and especially skills using a variety of learning experiences, with emphasis on participatory methods. The intervention was theory-based, and innovative for the context of the Arab countries.

We assessed the effectiveness of this intervention, by evaluating the extent to which its process and outcome objectives are met.

Outcome objectives:

- ✓ Enhance LS, mental health, Body Mass Index (BMI) and dietary habits amongst at least 80% of the participants.

Process objective:

- ✓ Ensure that at least 80% of the participants are satisfied with the sessions' content and delivery.
- ✓ Ensure that the trainers are satisfied with the flow and objectives of the sessions.

Methods

Procedure and intervention design

This is a quasi-experimental study with pre and post-test design with a control group. It was piloted in one private university that has five branches located in different areas in Lebanon. Students enrolled in this university mainly came from low to medium socioeconomic levels. The sample size was calculated using G-Power software that indicated the minimal sample size to be 80 participants in each arm.

To have an effective LS program for this study, the intervention was aligned with the International Youth Foundation (IYF) minimal standards (IYF, 2013). Also, its modules were adopted from SAWA for Development and Aids LS curriculum (SAWA, 2020), as well as the Boston University LS program (Helfrich, 2011). The duration of the training reached 60 hours. The trainers were qualified since they were selected based on their experience in designing and implementing LS programs amongst vulnerable communities. The program has been monitored and evaluated through tackling the process objectives using log sheet, sessions' evaluations by the trainers and trainees, and the impact objectives using quantitative (self-administered survey) and qualitative (focus group discussions) approaches before and directly after the interventions' implementation (IYF, 2013). This mixed method approach helped to triangulate results.

Intervention and control groups

Intervention model. A total of 20 online training sessions, with a duration of 3 hours each, for a period of 10 weeks, was provided to the intervention groups. These sessions addressed the proximal level of the ecological system targeting the behaviour, attitude and knowledge of the individual as well as more distal macro-system, such as the interaction of the individual with his peers. Also some aspects of the effect of policies in students' decisions and behaviours were addressed (Bronfenbrenner,1977, 2001, 2005). The first session was about introducing the program to students and highlighting the importance of LS. Each one of the subsequent 19 sessions covered one life skill. To reinforce the knowledge that students acquired throughout the session, individual and group-based assignments were given to students, all the sessions' learning objectives were designed to cover Casey seven competencies (see Table 1). In the first session, four focus groups were conducted with

Table 1. Life skills (LS) topics covered by Khotwa program, delivered to the intervention group.

Session	Topics	Learning objectives
1	Effective communication	Adopt healthy lifestyle through food and nutrition management
2	Building trust	Deal effectively and efficiently with money management
3	Self esteem	Prepare youth for workforce and labour market
4	Mental models	Equip youth with self-care skills to promote primary prevention
5	Self-motivation	Identify the characteristics of effective communication and negotiation skills and practice them
6	Stress management	Identify the characteristics of building trust in others
7	Positive thinking	Develop a new way of brain training that leads to efficient decisions and changes and problems solving
8	How to achieve a dream/goal	Provide self – help knowledge and develop motivational excellence
9	Decision making	Develop ways for stress management and positive thinking
10	Conflict resolution	Develop a new strategy for goal settings and vision
11	Problem solving and negotiation	Identify the characteristics of the teamwork
12	Team building and leadership	Define the importance of leadership
13	Volunteering and collective strengths	Identify the characteristics and benefits of volunteering
14	Food and nutrition management	Identify the characteristics of collective strength
15	Self-care	
16	Searching and succeeding in a job	
17	Money and house management	

some students to have a better understanding of the view of youth regarding LS and its impact on their health. In the last session, students shared a personal story about how the Khotwa program impacted them, taking into consideration the proximal and distal ecological factors, and provided feedback about their participation in the program. Also, the trainers submitted a summary highlighting the impact of LS on participants' mental health and dietary habits.

Participants. Khotwa program was offered as an elective academic course: Life Skills for Youth, announced on the university management system, where 78 students were voluntary enrolled in it. An email was sent by the registrar office for students who did not take the course to ask them to participate in the study as a control group. Eligible participants needed to have the following characteristics: full time students, living in Lebanon in the last 5 years, coming from low- to medium socio-economic level (<3000,000 LL per month = $750 per month), receiving financial aid, never participated in any previous LS training or workshop; willing to complete mental health, dietary habit and LS assessments (pre and post-intervention); and were aged between 18 and 30 years old, majoring in any faculty/school, and both males and females can participate. The control group, which consisted of 78 students who chose not to take the LS course, were asked to fill in the self-administered survey twice with a 3-month difference. A registered nutritionist at the university provided participants with a free body mass composition test and some nutritional advice, as an incentive to participation. Participants in the control group were not in a direct contact with each other, as it was an online training due to covid-19 preventive measures. This minimized the contamination bias.

The study was approved by the Ethics Committee of the Modern University for Business and Sciences (MUBS). A written consent form was obtained from both the intervention and control groups which clearly explained the scope of the study to both groups in terms of number of sessions, objectives and forms of evaluation. Any student who did not meet the criteria could enroll in the course but s/he could not participate in the study.

Instruments

Quantitative aspect

A. A self-administered Arabic questionnaire: It was used to assess participants' LS, internalising mental health disorders of anxiety and depression, dietary habits and their BMI. The scales used are the following:

BMI. Corrected BMI was calculated using standardized and calibrated scales by Salameh et al. (2014). Corrected BMI ameliorates socially desirable responses. The equations are: for males corrected weight = (1.003 × reported weight) and corrected height = (0.959 × reported height) + 7.59 and for females corrected weight = (0.942 × reported weight) + 3.14 and corrected height = (0.943 × reported height) + 9.42. Therefore, the corrected body mass index (BMI) was calculated as follows: corrected weight in kg/corrected $(h)^2$ (in m). Based on the World Health Organization (WHO, 2003) classification, BMI values were classified into four categories

for individuals 18 years of age or older: underweight (BMI $< 18.5\,kg/m^2$), normal weight (BMI 18.5–24.9 kg/m^2), overweight (BMI 25–29.9 kg/m^2) and obese ($\geqslant 30\,kg/m^2$).

Smoking. The frequency of smoking was measured by asking participants to indicate whether they smoked cigarettes, hookah or both, and, if so, how frequently they smoke per week. Those who smoke both are referred to as Mixed Smokers.

Life skills (LS) questionnaire. Following WHO guidelines, the Casey Life Skills questionnaire (CLS, 2012) was employed in the present study with a Cronbach's alpha of 0.95, which represents an excellent internal consistency. The CLS has the following subscales: daily living (17 items related to meal planning and preparation, cleaning and food storage, home maintenance and computer and internet basics), self-care (17 items including healthy physical and emotional development, such as personal hygiene, taking care of one's mental and physical health and contraception use), relationships and communication (18 items assessing developing and sustaining healthy relationships, cultural competency and self-expression), housing and money management (23 items assessed banking and credit, finding and keeping affordable housing, budgeting and living within one's means), work and study (20 items assessed employment; understanding of contracts and legal matters; and study skills), career and education planning (nine items assessed career path and choice of discipline in postsecondary education), looking forward (eight items assessed level of confidence and internal feelings important to their success). Responses were calculated by summing up the answers for each subscale, the questions were on a likert scale ranging from 1 = No, 2 = Mostly No, 3 = Somewhat, 4 = Mostly Yes and 5 = Yes.

Food frequency questionnaire (FFQ). FFQ comprised 18 semi-quantitative questions measuring the five basic food categories typically consumed by Lebanese. FFQ used in this study was adapted from a questionnaire validated in Lebanon by Salameh et al. (2014). Participants indicated how often each food item was usually consumed with four possible answers for each of the food categories: (1) never, (2) once or twice per week, (3) three to six times per week and (4) daily consumption.

Mental health status. The Arab Youth Mental Health Scale (AYMH), a 21-item scale developed and validated by Makhoul et al. (2011), in Lebanon, was employed in the present study to measure internalising mental health disorders of anxiety and depression as a single scale. AYMH is an epidemiological measure, not a diagnostic one, rated on a 3-point scale from always, sometimes, to rarely. Cronbach's alpha in the present study was 0.80.

B. Sessions' evaluation: Exit slips for sessions' evaluation consisted of three questions with 7-point likert scale, related to the participants' satisfaction in terms of content and facilitation, with a space to add any feedback.

Qualitative aspect

A. Focus Group Discussions: The interview guide used in conducting the focus group discussions consisted of different types of questions. Some of them addressed the participants' behaviours, such as 'what are their perceptions towards engaging in an unhealthy behavior', 'whether it is a priority for the participants to choose certain healthy behaviours' and 'the benefits and disadvantages of engaging in that behaviour by sharing their experiences'. Other questions were related to their LS, like 'their weaknesses and strengths in regards to their LS', 'whether they perceive LS as factors influencing their health' and 'share incidents where a gap in any LS was a barrier to achieve certain goals'. Moreover, students were asked questions related to the designing of the intervention, such as 'what motivates youth to be a part of an intervention program' and 'in what way the effectiveness of a LS intervention program might be enhanced'. The same questions were asked to the same focus groups right after the completion of the intervention.
B. Trainers' evaluation of students' engagement: Log sheets were collected from the trainers regarding their evaluation of each session in terms of students' attendance, sessions' objectives and timing.
C. Trainers' evaluation of the sessions' content: Meetings with the trainers regarding their feedback on the learning objectives and activities conducted during the sessions.

Analysis

Quantitative data statistical analysis

Outcome analysis. Using SPSS (version 22.0), a paired sample *t*-test was used to examine the mental health, LS and BMI score changes before and after the intervention. For multivariable analysis, repeated measures ANOVA was used to examine the effect of LS training on the mental health, BMI and dietary habits of the participants, after adjusting for basic sociodemographic characteristics. The significance level in all the tests was set at $p < 0.05$.

Process analysis. A descriptive analysis addressing the sessions' evaluation (exit slips) was conducted, and log sheets were summarized to highlight the absence rate of the students.

Qualitative data analysis

Outcome analysis. The focus group discussions were transcribed, verbatim and codes were identified following both an inductive and deductive approaches with multiple reads of the transcripts. Data were analyzed by using the thematic analysis, where emerging themes were identified.

Process analysis. A summary of the main assets and areas for improvements raised by the trainers regarding the sessions' objectives and activities.

Results

Demographics

The sample of this study consisted of 156 students attending a private university in Lebanon. The participants were evenly distributed amongst control and intervention groups ($n=78$). At baseline, the two groups had almost the same demographic, mental health, life skills and health behaviour characteristics with no statistically significant differences shown (Table 2) using General Linear Modelling.

Intervention group description

Amongst 78 students, 15% were freshmen (first year), 18% were sophomore (second year), 52% were junior (third year), 7% were senior (fourth year) and the remaining were either a master or Ph.D. student (see Table 2). The sample contained more females (81%) than males (19%) and had a mean age of approximately 21 years old. On weekdays, the majority of participants (73%) stated that they sleep from 5 to 8 hours per day, 13% sleep <5 hours a day, and the rest sleep more than 8 hours per day. In the weekend, approximately half of the participants (52%) claimed that they sleep from 5 to 8 hours per day, 37% of them sleep >8 hours, and the remaining sleep <5 hours a day. Additionally, most of the students (76%) succeeded in attaining normal weight status, and only a few students had an abnormal weight status: 8% underweight, 8% overweight and 8% obese. Also, the dietary intake of the intervention group was similar to that in the control group. Finally, 18% of the sample had mental health problems.

Control group description

The sample consisted mainly by juniors/third year (48%), followed by freshmen/first year (20%) and sophomore/second year (19%), with smaller proportion of senior/fourth year (5%) and master or PhD students (8%). Most of the participants were female, and only 22% were male. The students had a mean age of approximately 21 years old. On weekdays, 80% of participants indicated that they sleep from 5 to 8 hours per day, 12% sleep <5 hours a day and the rest sleep >8 hours per day. In the weekend, more than half of the participants (62%) claimed that they sleep from 5 to 8 hours per day, 29% of students sleep >8 hours and the remaining sleep <5 hours a day. Also, only 31% are above recommended weight guidelines whereby 11% were obese, 10% were overweight and 10% were underweight. Finally, 21% of the sample had mental health disturbance.

Process evaluation

Although the percentage of students' attendance in the first two sessions was below 90% due to the add and drop period, it gradually increased and ranged between 90% and 100% throughout the remaining sessions. The latter indicates that the trainers of the course succeeded in keeping the students involved and excited to attend the next sessions and that the content of each session was important and interesting. For instance, the students were, on average, 92% satisfied with the trainers' performance and 89% satisfied with the content of each session (Figure 1). Overall, the objectives of each session have been met as the participants claimed that they benefited from the course and gained valuable knowledge about these precious real-LS. The only concern was that students wanted more practice and case studies related to the content of each session. However, if this training was implemented in regular classes, this issue will be solved as the trainers will have more control over the session's time.

Outcome evaluation

Life skills (LS). The intervention and control groups differed significantly in terms of self-care ($t[78]=-6.27, p<0.001$), housing and money management ($t[78]=-3.27, p=0.002$) and looking forward subscales ($t[78]=-2.73, p=0.008$); however, no significant impact was seen on the following LS subscales: daily living ($t[78]=0.02, p=0.982$), relationships and communication ($t[78]=1.12, p=0.266$), work and study ($t[78]=-1.67, p=0.1$) and career and education planning ($t[78]=-0.76, p=0.449$) (see Table 3). Overall, the mean score for each of the LS subscales, except for daily living and relationships and communication subscales, increased in the intervention group. Oppositely, in the control group, the mean score decreased for almost all LS, except for daily living, housing and money management and looking forward/goal settings. In other words, participants in the intervention group demonstrated substantial performance improvement in almost all the LS compared to those in the control group.

Dietary intake and BMI. Even though the intervention did not insignificantly change high calorie intake ($t[78]=0.26, p=0.791$), and hot beverages intake ($t[78]=0.07, p=0.944$), it significantly decreased low calorie intake ($t[78]=1.97, p=0.05$) and processed food intake ($t[78]=2.21, p=0.03$) (see Table 3). In other words, students in the intervention group achieved a healthier eating habit compared to those

Table 2. Characteristics of the participants in the Khotwa program.

Variables	Intervention group		Control group		*p*-Value
	n (%)[a]	*N* (78)[b]	*n* (%)	*N* (78)	
Gender					
Male	19	15	22	17	0.423
Female	81	63	78	61	
Age (*M* ± SD)	20.88 ± 7.16		21.01 ± 6.08		0.229
Sleeping hours					
Weekdays (hours)					
<5	13	10	12	9	0.053
5–8	73	57	80	62	
>8	14	11	8	7	
Weekend (hours)					
<5	11	8	9	7	0.075
5–8	52	41	62	48	
>8	37	29	29	23	
Year at university					
First	15	12	20	16	0.681
Second	18	14	19	15	
Third	52	41	48	37	
Fourth	7	5	5	4	
Master or PhD	8	6	8	6	
Dietary intake					
Low-calorie intake	7 ± 4.37		6.90 ± 3.37		0.679
Processed food intake	5.46 ± 3.50		5.59 ± 2.90		0.943
High-calorie intake	6.94 ± 3.87		7.04 ± 2.87		0.736
Hot beverages intake	1.81 ± 1.15		1.99 ± 2.15		0.783
Weight status					
Underweight	8	6	10	8	0.435
Normal weight	76	60	69	53	
Overweight	8	6	10	8	
Obese	8	6	11	9	
Mental health status					
Absence of internalising mental health disorders of anxiety and depression	82	65	79	61	0.495
Presence of internalising mental health disorders of anxiety and depression	18	13	21	17	

[a]Percentage.
[b]Frequency.

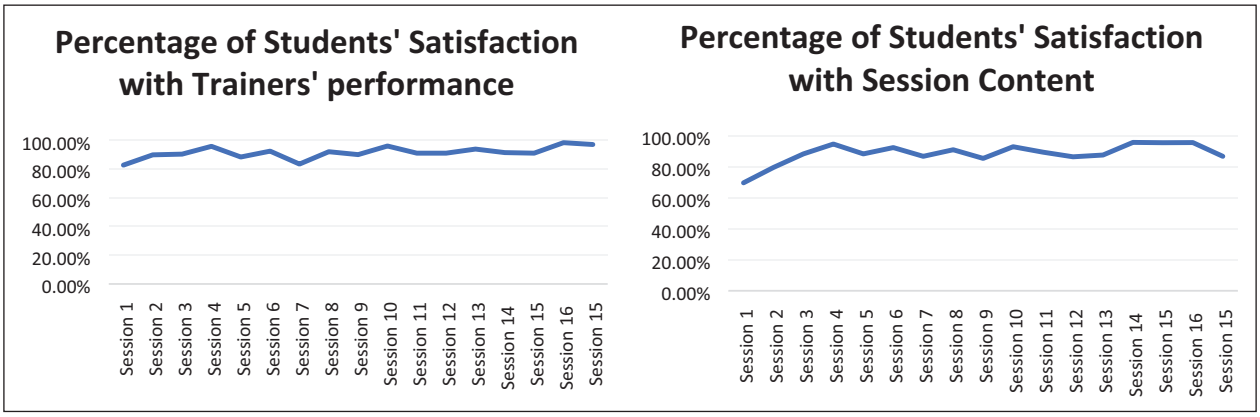

Figure 1. Percentage of students' satisfaction

Table 3. Pre-post paired *t*-test results.

	Mean	Standard deviation	*t*	df[a]	Sig. (two-tailed)[b]
Control group					
Body mass index	−0.15	0.47	−2.81	78	0.006
Mental health	−1.11	9.99	−0.99	78	0.325
Low calorie	2.50	6.32	2.97	78	0.063
Processed food	1.97	3.54	1.21	78	0.07
High calorie	1.02	4.98	0.4	78	0.87
Hot beverages	0.05	1.04	0.09	78	0.81
Daily living	−0.04	0.85	−0.43	78	0.667
Self-care	0.01	0.67	0.07	78	0.942
Relationships and communication	0.17	0.86	1.75	78	0.084
Housing and money management	−0.01	1.11	−0.09	78	0.930
Work and study	0.02	1.24	0.11	78	0.914
Career and education planning	0.02	0.47	0.38	78	0.708
Looking forward	−0.01	0.65	−0.06	78	0.951
Total-life skills (LS)	0.03	1.04	0.28	78	0.779
Intervention group					
Body mass index	0.20	8.18	0.22	78	0.827
Mental health	2.74	9.90	2.72	78	0.008
Low calorie	1.50	6.62	1.97	78	0.050
Processed food	0.97	3.84	2.21	78	0.03
High calorie	0.16	5.21	0.26	78	0.791
Hot beverages	0.01	1.64	0.07	78	0.944
Daily living	0.00	1.56	0.02	78	0.982
Self-care	−0.48	0.68	−6.27	78	<0.001
Relationships and communication	0.20	1.61	1.12	78	0.266
Housing and money management	−0.30	0.80	−3.27	78	0.002
Work and study	−0.30	1.60	−1.67	78	0.100
Career and education planning	−0.15	1.75	−0.76	78	0.449
Looking forward	−0.34	1.10	−2.73	78	0.008
Total-life skills (LS)	0.04	1.66	0.23	78	0.821

Significant at the $p < 0.05$ level.
[a]Degree of freedom.
[b]*p*-value.

in the control group by significantly decreasing their consumption of processed food. There was, however, no significant effect in terms of body mass index ($t[78] = 0.22$, $p = 0.827$) (see Table 3).

Mental health status. Significant positive impacts were observed on students' mental health status ($t[78] = 2.72$, $p = 0.008$) (see Table 3). The mean score for the intervention group decreased, while the mean score for the control group increased. Hence, students in the intervention group succeeded in building better mental well-being as compared to those in the control group.

Multivariable analysis: Repeated measures ANOVA test

Life skills (LS). At the baseline, there was a significant difference in the mean score, adjusted by gender, university year and region, between the intervention and the control group in terms of the following LS subscales: daily living ($p = 0.003$), self-care ($p = 0.044$) and housing and money management ($p < 0.001$) (see Table 4). After 3 months, this significant difference of the mean scores between the two groups, with a mean higher after the intervention, in regards to the three abovementioned LS subscales remained, and an additional significant difference appeared in terms of the mean scores of work and study ($p = 0.008$) and looking forward ($p < 0.001$) LS subscales (see Table 4). Hence, students who enrolled in this intervention showed significant performance enhancement in each of the following LS: daily living, self-care, housing and money management, work and study and looking forward in comparison to those in the control group.

Also, for the intervention group, a significant change was observed in the mean score of each of the following LS subscales: self-care ($p = 0.001$), work and study ($p = 0.013$),

Table 4. Repeated measures ANOVA results.

	Baseline			3 Months later			*p*-Values	
	M_c[a] ± SD_c[b]	M_I[c] ± SD_I[d]	*p*-Value	$M_c \pm SD_c$	$M_I \pm SD_I$	*p*-Value	*D* (Mc at baseline and Mc after 3 months)	*D* (M_I at baseline and M_I after 3 months)
Mental health	33.46 ± 7.70	32.60 ± 8.26	0.435	34.57 ± 6.40	29.86 ± 7.55	<0.001	0.707	0.012
Body mass index	22.97 ± 3.40	23.47 ± 4.95	0.495	23.12 ± 3.28	23.27 ± 6.30	0.963	0.026	0.089
Low calorie	7.24 ± 3.32	7.46 ± 3.43	0.679	8.02 ± 2.68	6.97 ± 4.32	0.091	0.178	0.964
Processed food	6.36 ± 2.98	6.44 ± 3.01	0.943	7.43 ± 3.42	5.54 ± 3.69	0.002	0.597	0.510
High calorie	8.02 ± 2.64	7.96 ± 2.64	0.736	6.77 ± 3.79	2.06 ± 0.99	<0.001	<0.001	0.578
Hot beverages	2.06 ± 0.95	2.07 ± 0.99	0.783	3.43 ± 2.99	1.93 ± 1.55	0.254	<0.001	0.891
Daily living	3.73 ± 0.64	4.05 ± 0.63	0.003	3.77 ± 0.66	4.05 ± 1.24	0.050	0.473	0.108
Self-care	4.05 ± 0.71	4.28 ± 0.69	0.044	4.04 ± 0.72	4.76 ± 0.33	<0.001	0.715	0.001
Relationships and communication	4.31 ± 0.77	4.36 ± 0.71	0.740	4.14 ± 0.78	4.15 ± 1.30	0.833	0.512	0.106
Housing and money management	3.36 ± 0.84	4.19 ± 0.61	<0.001	3.37 ± 0.83	4.48 ± 0.55	<0.001	0.146	0.255
Work and study	3.76 ± 0.79	3.84 ± 0.74	0.643	3.74 ± 0.81	4.14 ± 1.20	0.008	0.109	0.013
Career and education planning	3.98 ± 0.86	3.95 ± 0.87	0.738	3.96 ± 0.88	4.10 ± 1.27	0.334	0.661	0.011
Looking forward	4.08 ± 0.84	4.30 ± 0.84	0.164	4.09 ± 0.67	4.63 ± 0.69	<0.001	0.431	<0.001
Total-life skills (LS)	3.86 ± 0.68	4.08 ± 0.68	0.065	3.83 ± 0.70	4.04 ± 1.31	0.121	0.081	0.086

Significant at the $p < 0.05$ level.
[a]Mean score of the control group.
[b]Standard deviation of the control group.
[c]Mean score of the intervention group.
[d]Standard deviation of the intervention group.

career and education planning ($p=0.011$) and looking forward ($p<0.001$). The mean score of each of those LS increased (see Table 4). Thus, the intervention enhanced self-care, work and study, career and education planning and looking forward subscales for students in the intervention group. Finally, there was non-significant difference in the mean score of the control group's LS subscales over time.

Dietary intake. At the baseline, no significant difference in the intake of low-calorie food, processed food, high-calorie food and hot beverages with *p* values are $p=0.679$, 0.943, 0.736, 0.783 respectively was observed between the mean scores, adjusted by gender ($p=0.679$), university year ($p=0.943$) and region ($p=0.736$), of the intervention and the control groups in terms of all the components of dietary intake (see Table 4). However, over time, there was a significant difference between the mean scores of both groups, with the mean lower after the intervention, in terms of processed food ($p=0.002$) and high-calorie intakes ($p<0.001$). Hence, the intervention promotes a healthier lifestyle for students of the intervention group in comparison to the control groups, as it encouraged the intervention's participants to decrease their consumption of processed food and high-calorie intake.

Regarding the control group, a significant change was observed after 3 months in the mean score of each of the following components of dietary intake: hot beverages ($p<0.001$) and high calorie ($p<0.001$). Thus, the control group decreased their consumption of high calorie (mean score decreased) while increased their hot beverage intake (mean score increased). However, for the intervention group, there was an insignificant difference between its mean score before and after implementing the intervention in the intake of low-calorie food, processed food, high-calorie food and hot beverages with *p* values are $p=0.964$, 0.510, 0.578, 0.891 respectively.

BMI. There was no significant change between the mean scores, adjusted by gender, university year and region, of the intervention and the control groups ($p=0.963$), as, after 3 months, the mean score of the intervention group is somehow equal to the mean score of the control group (see Table 4). Thus, the intervention did not affect the body mass index and the weights of the students in the intervention group. Moreover, a non-significant change ($p=0.089$) was noted in the mean score of the intervention group's BMI before and after implementing the intervention. However, for the control group, a significant difference was observed ($p=0.026$), as its mean score increased (see Table 4). Thus, the students in the control group gained extra weight after 3 months.

Internalising mental health disorders of anxiety and depression. At baseline, the control and intervention groups have non-significant difference in the internalising mental health

disorders of anxiety and depression scores (see Table 4). However, after 3 months, there was a significant difference between the mean scores, adjusted by gender, university year and region, of both groups ($p < 0.001$), with the mean lower after the intervention (see Table 4). In other words, over time, the intervention group showed notable performance improvement in terms of mental health status compared to the control group. Thus, the intervention in which university students participated played a pivotal role in enhancing their mental health status.

Also, for the intervention group, there was a significant change ($p = 0.012$) in the mental health status, as its mean score decreased after 3 months of implementing the intervention. Hence, the intervention improved the mental health status of the intervention group's students. However, no significant difference ($p = 0.707$) was observed in the mean score of the control group after 3 months.

Focus group discussions

Based on the interview guide used for the focus group discussions at the baseline and after the intervention, three main themes were identified.

Unhealthy behaviour: Knowledge and practices. At the baseline, participants defined an unhealthy behaviour as any behaviour that might put an individual at risk for physical damage. Only a few students linked their behaviours to their mental health status. The most common risky behaviours that were mentioned during the focus groups include smoking (Shisha in specific), an unhealthy diet and a sedentary lifestyle. Students claimed that such behaviours are due to the lack of time, or exercise or laziness to prepare food. Regarding smoking, participants indicated that they usually smoke when they are in groups or influenced by their peers. Besides, some participants claimed that they feel satisfied when they eat high-calorie food or when they go out with their friends to smoke Shisha. For example, a female student who is 23 years old stated that 'junk food and shisha make me happy and satisfied'. When participants were asked about giving examples of the negative consequences of unhealthy behaviours, the majority answered obesity, stress and financial issues. For instance, they spent money on an ad hoc manner on food and unnecessary items.

The perceptions of participants in the focus groups have changed after the intervention as they became more knowledgeable about new types of risky and unhealthy behaviours, such as unprotected sex, dangerous relationships, lack of self-care and lack of budget management. Also, they were able to link these behaviours to mental and biological health while addressing all the ecological factors that contribute to human wellbeing, such as families, friends and the environment itself. Although participants mentioned that they are still engaged in some unhealthy behaviours, such as eating junk food or drive fast, they indicated that they are now more aware of the financial and social burden of diseases. They are more confident to move towards a healthier lifestyle as they have the essential skills needed. For example, a male student who is 23 years old emphasized that 'this course is an important step towards a better understanding of our body and our mind'. The course had positive impacts not only on students but also on their families as some of the students' mothers attended some of the sessions, especially those related to house, food, money management and self-care.

Life skills (LS) and health. Questions related to participants' LS were addressed by asking them to define LS and to discuss their weaknesses and strengths in regard to these skills. At the baseline, students had an unclear or incomplete definition of LS, as the majority mentioned only communication skills. Also, there was a lack of knowledge regarding healthy behaviours, such as self-care, and food security and safety and regarding good management in terms of money, house, career and study plans. Besides, they were unable to link their challenges and failures to some LS gaps. However, after the intervention, students defined LS correctly. They have mentioned all the life skills dimensions compiled with examples for each dimension. Additionally, they were able to link LS with their physical and mental health and to share incidents related to a gap in their LS that lead them to a challenging experience. For instance, one student mentioned that 'I passed through a very critical situation at home due to my brother's illness, I was able to cope by building trust with my family members and mitigating the negative consequences through applying my money and house managements skills, this helped me to overcome my challenges'.

Intervention: Suggestions and feedback. At the baseline, students were asked questions related to the designing of the intervention, such as 'what motivates youth to be part of an intervention program' and 'in what way the effectiveness of a LS intervention program might be enhanced'. Participants mentioned the lack of time as the main reason that prevents them from participating in interventions or workshops as they have classes or part-time work. Also, they claimed that they might attend any training that provides them with certificates to be added to their professional profiles. After offering the intervention as an elective course, students have enrolled and the number of attendees was maintained throughout the whole sessions. Students' feedback was described in the process analysis section where they showed a high level of satisfaction. For example, a female student who is 27 years old mentioned that 'this course touches our daily life behaviour, it teaches us how to link what we do with who we are, it gives us the platform to reflect on our behaviours and adjust them accordingly'. In summary, due to the success of the program, students have requested an extension of the course to discuss more topics and more case studies.

Discussion

The current study investigated the effectiveness of a LS intervention in promoting a healthy lifestyle and improving mental health status for university students. Overall, the results of this study show that LS training is an efficient approach to improve the life skills healthy lifestyle habits and mental health of university students. In fact, students who received the training intervention had a noticeable improvement in almost all the variables. The analysis of 3-month follow-up data provided robust evidence of the effectiveness of such online training. Therefore, the current study confirms the literature with regards to enhancing students' mental and physical health and contributes new findings. To our knowledge, it is the first study to implement and evaluate a health promotion life skills intervention in the Arab World and in Lebanon in specific. Furthermore, this study added to the literature since little attention has been paid on exploring the effectiveness of life skills intervention at university level (Savoji and Ganji, 2013).

Internalising mental health disorders of anxiety and depression

Although studies showed that university students will have a better self-esteem and more ability to regulate negative emotions than in their adolescence; they also found that under conditions of low socioeconomic level and history of adverse experiences, like the Lebanese context, this transition phase can become a critical period resulting in an increase in psychological distress (Grant and Potenza, 2010; Hunt and Eisenberg, 2010; Schwartz et al., 2011). Similar to the results of Savoji and Ganji's (2013) study, this analysis proves the positive effects of LS intervention on the mental health status of university students. The LS program adopted in this study integrated mental models, communication and interpersonal skills, problem solving, positive thinking and conflict resolutions in addition to different kinds of management skills; all these themes are usually used by university counselors through adopting the brief psychodynamic model that proved to enhance students' self-satisfaction and decrease their internalising behaviours of anxiety and depression (Riva Crugnola et al., 2020). Hence, similar to other studies, Khotwa intervention proved its potential in enhancing students' abilities to cope with those challenging situations happening in Lebanon, increasing their level of self-esteem (Esmaeilinasab et al., 2011; Pradeep et al., 2019) and decreasing their level of stress about finding a job by guiding them on how to search for a job and the adequate techniques to be prepared for the labour market. For instance, after 3 months of implementing the training, participants had superior feelings about themselves, less personal problems and a strong ability to build healthier mental well-being, as compared to students who did not participate in the program. Thus, LS training plays a potent role in causing a significant positive transformation in terms of participants' mental health status by promoting stress management and positive thinking skills (Irannezhad, 2017; Spaeth et al., 2010).

BMI

Although analysis' outcomes revealed that this training did not impact the body mass index of the intervention group, participants succeed in keeping the same weight even after 3 months of training. Interestingly, control group participants have a higher BMI score after 3 months, this might be explained by the absence of techniques/skills to maintain healthy lifestyle. Hence, the implementation of such intervention that encompasses sessions related to healthy eating and lifestyle promotion, such as food and nutrition management, is necessary for university students (Sabbah et al., 2013). As acknowledged by Bhushan et al., (2018) and Ferland et al. (2015), interventions that address LS have the potential to embrace positive changes in individuals' lives, especially those related to obesity prevention.

Dietary intake

All tests used in the analysis part acknowledged that processed food consumption was decreased by the students who enrolled in the online training. Hence, similar to Lillehoj et al. (2004) study, the findings emphasized that the intervention promoted healthier eating habits by persuading participants to adopt a healthy lifestyle. In other words, building LS intervention that includes sessions related to healthy diet and lifestyle, such as food and nutrition management, is a key to improve health behaviours of university students, like decreasing their consumption of unhealthy diets and increasing their physical activities (Ferland et al., 2015; Meng et al., 2018). Also, the results of the dietary intake of the control group support and emphasize our findings. For instance, students in the control group increased their consumption of unhealthy food as they did not participate in the training.

Life skills (LS)

The results in the analysis part were not consistent in terms of LS subscales, as they differ slightly. The paired *t*-test indicated that housing and money management, looking forward and self-care skills of participants had improved after the intervention. However, when comparing the mean score of the control and the intervention groups, the results revealed that work, and study, and looking forward skills of students in the intervention group had enhanced. While, when comparing the intervention group's mean score before and after the intervention, results showed that self-care, work and study, career and education planning and looking forward skills had improved after the intervention. As

claimed by Papacharisis et al. (2005), students who enrolled in life skill-based intervention showed significant performance enhancement in many LS subscales, including looking forward, work and study and self-care. In other words, such intervention succeeded in preparing participants for the labour market, equipping them with self-care skills to promote primary prevention, developing their decision-making and problem-solving skills to study or work effectively, enabling them to create a new strategy for goal setting and vision and, finally, teaching them how to manage efficiently their money (Cronin et al., 2018; O'Hearn and Gatz, 1999; Papacharisis et al., 2005; Shek and Sun, 2012).

Limitations

The intervention was supposed to be given in person, but due to political reasons (Oct 17th revolution) and COVID-19 lockdown, we switched into online sessions which was received positively by the participants. The online format can enhance the replicability and scalability of the program to reach higher number of students at low cost and make it accessible to everyone. However, This LS program can be improved in several ways. First, Khotwa was conducted with students enrolled in a private university, with low to medium socio-economic background; therefore, we couldn't study the effect of such intervention on students who are enrolled in a public university, or students with a high socio-economic level. Second, we might have the possibility of selection bias related to self-selection of students to the course; it might be that students who are in the control group felt confident enough not to take the course, while the intervention group thought they needed it. However, the deterioration of the outcome measures in the control group over the course of the intervention points to a minimal role of self-selection in this regard. Finally, despite the fact that a registered psychologist was monitoring the process of the whole program, we were not able to conduct a psychological clinical assessment before and after the intervention for both the intervention and control groups, we only relied on a self-administered survey to test the behavioural changes at baseline and after 3 months which may increase the risk of information bias related to recall issues and social desirability. Furthermore, although we conducted a multivariable analysis, the risk of a residual confounding is still present. Further studies are suggested to confirm our findings and to perform a comparative study to check the effect of such an intervention on university students with different socio-economic levels.

Implications for practice and policy

Our findings showed significant differences between the intervention and the control groups for almost all variables at the 3-month follow-up. Results revealed that the intervention had positive effects on the life of university students, as it promoted their LS and encouraged them to achieve an improved and healthier lifestyle and a better mental health status. This intervention can play an important role in enhancing social, emotional and cognitive skills and helping young adults to achieve their goals, by strengthening their abilities to meet the demands of the present society and be successful in life. Khotwa program improved mental health, promoted healthy eating habits, improved weight status and boosted the LS of university students in this intervention. From a clinical perspective, the effect of LS intervention on students' internalising behaviours examined in our study was promising in terms of its usefulness. Such interventions coupled with university counseling showed to be associated with a reduction of psychological distress and an increase in life satisfaction amongst university students (Riva Crugnola et al., 2020). Therefore, university administrations should consolidate the efforts with researchers to visualize the outcomes of such programs to their students and study both its short and long term effects on students' mental and physical health outcomes.

The inclusion of such a LS program in all universities as a mandatory or elective course has been advocated by a number of researchers in different countries (Botvin et al., 2001; Erawan, 2010; O'Hearn and Gatz, 1999; Papacharisis et al., 2005; Savoji and Ganji, 2013). This is even more important in the context of Lebanon given the dire social and economic situation, to help set students on a path to succeed in achieving a better quality of life and well-being (Haji et al., 2011). The majority of the LS programs in developing countries, including the ones implemented on ad-hoc basis in Lebanon, lack efficient implementation, assessment and monitoring (Nasheeda et al., 2019). The findings of our study indicate the need to recognize LS programs as part of the national curriculum. This can be spearheaded by drafting a policy similar to ones developed in both developing and developed countries such as Namibia (Ministry of Education, 2015), Cambodia (Kim, 2011), Ministry of Youth Affairs and Sports, Government of India (2014) and New Zealand (Chen, 2017) where LS is identified as one of the priority interventions for the overall development of youth. This policy can facilitate the implementation of this program at large within the educational system of the country. One such example can be the provision of an online course through the website of the Ministry of Education and Higher Education or Center of Educational Research and Development in Lebanon. The development of this LS intervention in Arabic in our study can also facilitate its uptake and scaling up into the educational system of other Arab countries or in Arab communities elsewhere in the world.

Author's note

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Ethics approval

IRB approval taken from the Modern University for Business and Science MU-20200414-18. The study was performed in accordance with the ethical standards as laid down in the 1964 Declaration of Helsinki and its later amendments.

Consent to participate

All students participated in both, intervention and control groups have signed consent forms stating that their participation in the research study is voluntary, without any coercion or induce influence

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