Lions Quest Skills for Adolescence Program as a School Intervention to Prevent Substance Use—a Pilot Study Across Three South East European Countries

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Abstract

Development of personal and social skills in a classroom prevents later drug use and alcohol abuse, and influence-related risk factors. However, clinical trials on the potential impact of such programs from low- or middle-income countries remain limited. Lions Quest Skills for Adolescence (LQSFA), a school-based prevention intervention supporting life skills, was implemented in three South East European countries. This was a collaboration between the United Nations Office on Drugs and Crime, the Lions Clubs International Foundation, and the Ministries of Education of Serbia, the Former Yugoslav Republic of Macedonia and Montenegro. The pilot was a multisite non-randomized trial. A total of 2964 elementary school students received the intervention through 232 instructors trained by the same internationally certified trainer. These were compared to 2232 students following the regular curriculum, which does not include LQFSA, in the same elementary schools. The assessment was done at the beginning and at the end of the same academic year (period of 10 months). Despite limited fluctuations, the overall results indicated an encouraging outcome on the current use of substances (alcohol, cigarettes, and marijuana) as well as intention to using these substances in the next 3 months among current users. This study attempts to address this aforementioned gap in literature and contributes to the body of research demonstrating the value, feasibility, and transferability of life skills programs in achieving prevention outcomes in South East Europe. Moreover, it paves the way to a future randomized clinical trial to further corroborate the results, overcoming limitation in current study design.

Keywords Drug prevention · South East Europe · Adolescents · Life skills education · Lions quest skills for adolescence

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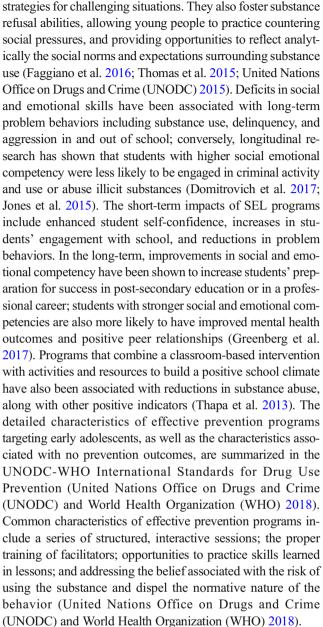
Background

Substance abuse is a serious and growing problem globally; its size and scope vary among different countries and cultures (Ahlstrom and Oserberg 2005). However, the age of initiation of use of substances tends to be similar across all countries, peaking during the period between early to mid-adolescence (United Nations Office on Drugs and Crime (UNODC) 2015). Moreover, this early age of initiation is considered as a strong predictor of escalation into problematic use (United Nations Children's Fund (UNICEF) 2007; Viner and Barker 2005) and as such a major public health challenge (Nelson et al. 2015).

The literature highlights several factors of vulnerability—or, conversely, resilience—linked to substance use initiation that differs according to age (Pihl 2014; United Nations Office on Drugs and Crime (UNODC) 2015). Adolescence is a stage during this developmental life span when youth are exposed to new ideas and behaviors through increased associations with people and organizations beyond those experienced in childhood (Eccles 1999). It is a stage in life when new "adult" roles

and responsibilities begin to be assumed. In parallel, it is a period of great imbalance between heightened emotional reactivity and poor self-regulation skills (Casey and Caudle 2013) related to the rapid hormonal changes and to the prefrontal cortex part of the brain being still ongoing development (Blakemore and Choudhury 2006). Nevertheless, it remains a time when the brain's plasticity and malleability, much like in earlier ages, still allow for many interventions to be effective in reinforcing or altering earlier experiences (Fuhrmann et al. 2015; Spear 2013; United Nations Office on Drugs and Crime (UNODC) 2015). These significant changes occurring in the adolescent brain increase the risk towards involvement in potentially harmful and risky behaviors including initiation of substance use such as smoking cigarettes, drinking alcohol, and using other drugs (United Nations Office on Drugs and Crime (UNODC) 2015). Moreover, healthy attitudes related to substances as well as safe social normative beliefs become important protective factors against initiation of drug use. Good social skills, mental resilience, and emotional health remain key protective factors during adolescence.

Across cultures, schools are typically perceived as a key socialization agent; they typically reach a near-universal population and are often well-trusted by and well-connected to various stakeholders in the communities. Importantly, schools are already working to strengthen the protective factors associated with less substance use as a part of their core mandates. Schools are thus optimally placed to serve as a key prevention stakeholder and a natural entry point for prevention work (United Nations Office on Drugs and Crime (UNODC) 2017). A comprehensive education sector response to substance use may entail the implementation of evidence-based prevention programs in classrooms; efforts to strengthen substance use–related policies and health care services at the school level; the deployment of complementary national curricula; the creation of education sector policy frameworks, including a staff training system; and the overall management, coordination, and evaluation of efforts at all levels (United Nations Office on Drugs and Crime (UNODC) 2017). The school programs of most relevance for preventing substance initiation in this age group can be labeled as "Prevention education based on personal and social skills and social influence" (United Nations Office on Drugs and Crime (UNODC) 2015). Reviews of the research into social and emotional learning (SEL) programs provide evidence that these interventions help to build protective factors while reducing risk factors; in addition, there is evidence that social emotional competence is itself a protective factor against a number of risk factors and behaviors (Domitrovich et al. 2017); (CASEL 2013; Davis 2015; Taylor et al. 2017). In such programs, trained teachers conduct interactive sessions allowing students the opportunity to learn and practice a range of personal and social skills that help develop healthy coping

strategies for challenging situations. They also foster substance refusal abilities, allowing young people to practice countering social pressures, and providing opportunities to reflect analytically the social norms and expectations surrounding substance use (Faggiano et al. 2016; Thomas et al. 2015; United Nations Office on Drugs and Crime (UNODC) 2015). Deficits in social and emotional skills have been associated with long-term problem behaviors including substance use, delinquency, and aggression in and out of school; conversely, longitudinal research has shown that students with higher social emotional competency were less likely to be engaged in criminal activity and use or abuse illicit substances (Domitrovich et al. 2017; Jones et al. 2015). The short-term impacts of SEL programs include enhanced student self-confidence, increases in students' engagement with school, and reductions in problem behaviors. In the long-term, improvements in social and emotional competency have been shown to increase students' preparation for success in post-secondary education or in a professional career; students with stronger social and emotional competencies are also more likely to have improved mental health outcomes and positive peer relationships (Greenberg et al. 2017). Programs that combine a classroom-based intervention with activities and resources to build a positive school climate have also been associated with reductions in substance abuse, along with other positive indicators (Thapa et al. 2013). The detailed characteristics of effective prevention programs targeting early adolescents, as well as the characteristics associated with no prevention outcomes, are summarized in the UNODC-WHO International Standards for Drug Use Prevention (United Nations Office on Drugs and Crime (UNODC) and World Health Organization (WHO) 2018). Common characteristics of effective prevention programs include a series of structured, interactive sessions; the proper training of facilitators; opportunities to practice skills learned in lessons; and addressing the belief associated with the risk of using the substance and dispel the normative nature of the behavior (United Nations Office on Drugs and Crime (UNODC) and World Health Organization (WHO) 2018).

Accordingly, parallel to the family, the school becomes the social institution most adequate to implement intervention aiming at addressing the aforementioned factors (Jackson et al. 2012; Sanchez et al. 2016; World Bank 2015). While these International Standards offer descriptive indications on the main features that make classroom-based prevention programs effective, they highlight the fact that evidence on their effectiveness is still too scarce in low- and middle-income countries including in South Eastern Europe (United Nations Office on Drugs and Crime (UNODC) 2015).

The European School Survey Project on Alcohol and Other Drugs clearly highlights that alcohol, tobacco, and illicit drug use are common place among school students in South Eastern Europe (European Monitoring Center for Drugs and Drug Addiction 2016). However, a desk review of UNODC

did not indicate the presence of any program that can be labeled under "Prevention education based on personal and social skills and social influence" in any of the concerned Member States in the region. To respond to this need, a collaborative project was initiated between UNODC and the Lions Clubs International Foundation (LCIF) through an ongoing UNODC global program on prevention. This project aimed to pilot the Lions Quest Skills for Adolescence (LQSFA) initially in South East Europe, extending ongoing UNODC engagements with the concerned regional governments to build national capacities for a comprehensive drug demand reduction response.

Lions Quest is a program developed by LCIF and implemented in more than 100 countries worldwide; the middle school edition, Skills for Adolescence (LQSFA), is the most widely-used of the Lions Quest programs (Lions Club International Foundation 2018). There is a growing body of evidence into the effectiveness of LQSFA in the European context, particularly regarding the building of social competencies through program implementation. A multi-year randomized study in Norway found that LQSFA delayed the onset of alcohol experimentation and use; Lions Quest students had increased dialog with their parents regarding alcohol and drug use. In addition, Lions Quest students showed significant improvements in various social competencies, including self-esteem and social awareness (Malmin 2007). A similar study in Germany found that students participating in an adapted version of LQSFA had stronger refusal/resistance skills regarding tobacco, and those that were already smoking were more likely to try and quit (Kahnert 2002). An additional study in Germany demonstrated the potential of LQSFA to help reduce youth rates of smoking tobacco, and on a number of broader life skills indicators (Menrath et al. 2015). A two-year quasi-experimental study in Austria found positive effects on conflict resolution, a reduction in bullying behaviors, and on strengthening a positive classroom climate; the authors conducted additional multilevel analysis to demonstrate greater effects in the intervention schools that implemented the program with high-quality and a moderate implementation effect on schools with moderate quality (Amtmann et al. 2017).

The most robust research of LQSFA outside the USA specific to prevention indicators is in Latin America. A comparison of results in three countries (Colombia, Peru, and Paraguay) found LQSFA students had an improvement in perception of risk of substance abuse, as well as a lowering in the use rates of tobacco, marijuana, and alcohol (including binge drinking). The results were strongest in countries that had done a more robust cultural adaptation of curriculum materials (Salazar Silva 2015).

Despite the availability of research on LQSFA in the European context, most of this research is confined to higher income countries. Research on such programs particularly in East or South East Europe is scarce based on the database review of the UNODC-WHO International Standards on Drug Use Prevention (United Nations Office on Drugs and Crime (UNODC) and World Health Organization (WHO) 2018). The aim of this study is to summarize the results of the LQSFA pilot on substance use and intention to continue using among users in three South Eastern European countries.

Methods

Participants

Eligibility Criteria

Selection of Schools and Instructors This intervention was conducted in collaboration with the Ministries of Education of the concerned countries. The participating elementary schools were identified by the Ministries of Education. The intervention was first initiated in Serbia for testing during the academic year 2014–2015. At this stage, after consultation with the Serbian Ministry of Education, the program was introduced as an intervention arm only. The positive preliminary feedback received from this implementation encouraged the regional expansion of the pilot. The Ministries of Education in the two additional countries (FYRO Macedonia and Montenegro) selected the pilot schools and participating teachers, whose classes formed the intervention group. The Ministries of Education also in all three countries identified the comparison groups (i.e., the classes receiving the regular curriculum), per each school, for the study. Serbia and Montenegro decided to nominate the schools from the capital and major cities in the country, whereas the FYRO Macedonia selected schools from relatively rural areas.

Intervention

Content

Lions Quest Skills for Adolescence (LQSFA) is a program developed by Lions Clubs International Foundation. Originally drafted for use in the USA, it has been implemented in over 100 countries globally. The program is based on five key social emotional competencies identified by the Collaborative for Academic and Social Emotional Learning (CASEL): self-management, self-awareness, social awareness, relationship skills, responsible decision-making (CASEL 2013). It thus matches the description of effective prevention components found in the literature (CASEL 2013; United Nations Office on Drugs and Crime (UNODC) 2015). The aim of this program is to teach youth and young adults skills that build resilience against the use of alcohol, cigarettes, and marijuana, and that help to make healthy

decisions in life. The curriculum was built on the social and behavioral theories of Social Learning; Problem Behavior; Health Belief model; Reasoned Action-Attitude and Planned Behavior; and Social Norms (Jessor and Jessor 1977; Vigna-Taglianti et al. 2014).

During the period of 2014 through 2016, the UNODC piloted a tailored implementation model using a translated and adapted version of the fourth edition of the US version of Lions Quest Skills for Adolescence (LQFSA) (Eisen et al. 2003). This version of the program included 40 sessions focusing on the following topics: i) challenges entering the teen years; ii) building self-confidence and positive communication skills; iii) positive management of emotions; iv) improving peer relationships; v) making healthy choices; and vi) setting targets for a healthy, drug-free life. The 40-lesson implementation sequence mirrored one which was used and validated as effective in the USA (Eisen et al. 2003).

Intervention Delivery Method

The intervention material and timeline were presented for approval to the respective Ministries. This was followed by an initial cultural adaptation of the program. At this stage, the material was presented in English and in each of the national languages of the three countries to the representatives of their respective Ministry of Education for feedback. Feedback was confined to surface level adaptations, cosmetic, and editorial changes, and did not affect the content of the material; as such, all feedback and suggestions were accommodated. A total of 232 instructors ($N = 82$ in Montenegro and $N = 75$ in each of FYR Macedonia and Serbia) were enrolled and trained on the intervention curriculum material. Five rounds of training workshops were conducted in each country, with groups of 15–17 instructors each participating in a three-day workshop.

Training is an important part of the Lions Quest model. Teachers who attend a Lions Quest training facilitated by a certified trainer are more likely to perceive the goals of the program to be coherent and important to their students, and feel more competent and empowered to actually deliver program sessions in their classrooms (Talvio et al. 2016). Instructors' self-efficacy is an important factor in how they implement the program with fidelity (Talvio et al. 2016). New instructors were introduced in each training, and one to two instructors per country were identified across the five training waves to later qualify as national trainers. These selected candidate trainers received a regular training during the first session. In the second session, they participated in a form of "shadowing and observing" the trainer. In the third session, they co-lead some of the training sessions. In the fourth session, they lead the training while being supervised. During the fifth and final session, they lead unsupervised and they reported back their experiences to the main trainers. All trainings were conducted and supervised by the same internationally certified trainer on LQSFA. The comparison group followed the regular school curriculum which does not include LQFSA.

Pilot Description and Assessment

The intervention was conducted among a total of 5196 elementary school youths (average age 13 years) in three South East European countries (Serbia, Montenegro and FYRO Macedonia). The study population of this pilot was determined by the Ministries of Education of each country as a result of the existing engagement with UNODC. A standard LQSFA tool was used for data collection. This was a self-filled anonymous and confidential questionnaire distributed at two time-points. The first was prior to the intervention for baseline data, and the second at the end of the intervention; the study duration was 10 months in total. The same tool was used for the intervention and comparison groups. The data was entered by two independent consultants, using EpiData (El-Khatib 2004). Data analysis was conducted using Stata ver. 12.0 (StataCorp., 2011). The main outcome questions used for the purposes of this article are substance use in the last 30 days of alcohol, cigarettes, or marijuana (as proxy for current use) and intentions to use any of these substances in the next 3 months (among ever users of these substances). These were the main two indicators that the UNODC global prevention program needed to assess and document in an effort to consider such programs within the national strategic responses for drug use prevention by the Ministries of the concerned countries. Positive indication on these two indicators would advocate for commissioning a fully powered clinical trial to further document impact of the program.

Statistical Analysis

The analysis was done for each country independently. A set of complementary steps was used during the analysis. Delta analysis ($D\%$) was used to assess change in the indicators between pre-test (t0) and post-test (t1), contrasting as such this change within the intervention and comparison groups. This was complemented by an effect size assessment to quantify the difference in change between the two groups; a Cohen's d test was used to this effect (J Cohen 1988). Furthermore, an ANOVA analysis was implemented to further contrast difference in outcomes between intervention and comparison groups post-intervention (at t1). The ANOVA analysis for significance level was set at p values less than 0.05. Effect size of the intervention was assessed using Cohen's d at t1 (J Cohen 1988). To respect the full anonymity and confidentiality of the students' information on request of the Ministries of Education and the schools of concern, the surveys were answered in a fully anonymous fashion. Matching the questionnaires on the respondent level at t0 and t1 was as such not feasible. Therefore, to compensate for this caveat, a paired

matching strategy was used for pre- to post-data in each of the intervention and comparison groups (Shadish et al. 2002; Stuart and Rubin 2008). This matching was done randomly based on age and gender, using Stata ver. 12.0 (StataCorp. 2011). This dataset was used in an additional step of the analysis where a hierarchical level modeling was conducted, considering schools as the cluster of concern. Socioeconomic status was considered homogenous because all schools were selected from the same neighborhoods.

Results

Study Population Characteristics—Baseline

Across all of the countries, a total of 2964 students were enrolled in the intervention group, and 2232 students were enrolled in the comparison groups (Table 1). Seventeen schools participated in both Montenegro and Serbia; forty-seven schools participated in FYR Macedonia. Out of all enrolled students, the proportion of students enrolled in the intervention group was approximately 50% for Montenegro and FYRO Macedonia, and 72% for Serbia.

Despite minor fluctuations, the intervention and comparison groups across the three countries had very similar demographic distributions in terms of age and gender, and substance use history (use and intention to use in the next 3 months among users) at baseline. The average age of the students was around 13 years of age with a 1:1 distribution by gender. The most frequently used substance in the last 30 days, and intended to be used in the next 3 months among users, was alcohol; all of the three countries had similar reports on this substance. The second most frequently used substance in the last 30 days, and intended to be used among users in the next 3 months, across all three countries was cigarettes. Marijuana was the third-ranking substance in this regard, again with relatively similar reports across countries (Table 1).

Delta Analysis for Substance Use Indicators (Changes Within Groups Pre-Test vs. Post-Test)

Across the three countries, a larger relative increase in reported consumption of alcohol, smoking cigarettes, or smoking marijuana in the last 30 days was noted among the comparison as compared to the intervention group (Table 2). This was with the exception of smoking marijuana in the last 30 days in Serbia; however, the number of such users was too small to draw valid conclusions.

A similar sharper increase among the comparison versus the intervention group was also noted on the indicator of intention to use among users of the respective substances across the three countries (Table 2). The Cohen's d, quantifying the difference in increase of each indicator between intervention and comparison group across countries, revealed a range between small (< 0.20) and medium (< 0.40) effect (with few significant values) (Table 2).

Analysis of Variance (ANOVA) for Substance Use Indicators (Difference Between Groups at t1)

A higher prevalence of substance use in the last 30 days for all three substances was noted in the comparison group in contrast to the intervention group at t1 across all three countries. This difference reached statistical significance for smoking marijuana last 30 days for Montenegro and smoking cigarettes and/or smoking marijuana in the last 30 days for FYRO Macedonia. The difference was borderline significant for alcohol consumption last 30 days for Serbia (Table 3). In addition, the prevalence of intention to use the three substances in the next 3 months among current users was also higher at t1 among the comparison group as compared to the intervention group. This difference reached statistical significance for intention to smoke marijuana for Montenegro and smoking cigarettes for FYRO Macedonia. The difference was borderline significant for intention to use alcohol for Serbia (Table 3).

Multilevel Model-Adjusted Odds Ratio

While the results were mostly in favor of the intervention, none of the countries showed any statistically significant difference for drinking alcohol (current drinking and intention to drink in the next 3 months among users) (Table 4). Regarding smoking cigarettes, in FYRO Macedonia, the comparison group showed almost twofold increase in reporting the current history of smoking (OR 1.97, CI95% 1.30–3.00). As for the intention of smoking cigarettes in the next 3 months, there was less than a fourfold difference among the comparison group in Serbia (OR 3.52, CI95% 1.58–7.80). When it comes to smoking marijuana during the last 30 days, there was a statistically significant difference in each of Montenegro and FYRO Macedonia (OR 2.30, CI95% 1.31–4.03 and OR 2.51, CI95% 1.03–6.07 respectively).

Discussion

The results of this pilot across the two most commonly reported substances of consumption (alcohol and cigarettes) indicated consistently a relative change in prevalence that is more favorable to the intervention group in contrast to the comparison group. In the majority of cases, the results on marijuana were also more favorable to the intervention group. The pattern of significant findings was, however, quite mixed between countries, with many null results noted. The effect size of the intervention was small to medium, and in the direction favoring the intervention. Nevertheless, these favorable relative changes have reached the level of statistical significance

Table 1 Characteristics of the study population in Montenegro, FYRO Macedonia and Serbia

Characteristics	Montenegro (N = 1572)			FYRO Macedonia (N = 1575)			Serbia (N = 2049)		
	Intervention N (%)	Comparison N (%)	p value	Intervention N (%)	Comparison N (%)	p value	Intervention N (%)	Comparison N (%)	p value
Gender	N = 804	N = 768		N = 795	N = 780		N = 1365	N = 684	
Males	418 (52%)	385 (50.1%)		386 (48.6%)	400 (51.3%)		668 (48.9%)	360 (52.6%)	
Females	386 (48%)	383 (49.9%)	0.46	409 (51.4%)	380 (48.7%)	0.28	697 (51.1%)	324 (47.4%)	0.11
Age—years									
< 11	0	0		1 (0.1%)	0		5 (0.4%)	0	
11	2 (0.3%)	3 (0.4%)		16 (2.1%)	11 (1.4%)		68 (5.3%)	13 (2%)	
12	129 (17.2%)	158 (21.5%)		224 (28.6%)	207 (27.1%)		290 (22.6%)	105 (16.4%)	
13	227 (30.2%)	253 (34.4%)		241 (30.8%)	243 (31.8%)		468 (36.5%)	294 (45.9%)	
14	324 (43.1%)	260 (35.3%)		171 (21.9%)	168 (22%)		359 (28%)	199 (31%)	
> 14	69 (9.2%)	62 (8.4%)	0.02	129 (16.6%)	135 (17.7%)	0.77	91 (7.1%)	30 (4.7%)	< 0.01
Mean age (SD)	13.4 (SD 0.9)	13.3 (SD 0.9)	< 0.01	13.3 (SD 1.3)	13.4 (SD 1.3)	0.40	13.1 (SD 1.0)	13.2 (0.8)	0.02
Baseline information									
Substance use—last 30 days									
Drinking alcohol									
Never used	481 (60.1%)	487 (63.7%)		515 (64.5%)	493 (62.9%)		792 (58.2%)	425 (62.1%)	
None during last 30 days	212 (26.5%)	177 (23.1%)		185 (23.2%)	182 (23.2%)		373 (27.4%)	181 (26.5%)	
Users	107 (13.4%)	101 (13.2%)	0.28	98 (12.3%)	109 (13.9%)	0.62	196 (14.4%)	78 (11.4%)	0.11
Smoking cigarettes									
Never used	745 (92.7%)	718 (93.7%)		721 (91.3%)	689 (88.2%)		1259 (92.6%)	621 (92.4%)	
None during last 30 days	46 (5.7%)	36 (4.7%)		46 (5.8%)	62 (7.9%)		65 (4.8%)	30 (4.5%)	
Users	13 (1.6%)	12 (1.6%)	0.83	23 (2.9%)	30 (3.8%)	0.14	36 (2.7%)	21 (3.1%)	0.79
Smoking marijuana									
Never used	788 (98.4%)	750 (98.4%)		779 (98.4%)	764 (97.8%)		1329 (98.2%)	659 (98.1%)	
None during last 30 days	7 (0.9%)	5 (0.7%)		10 (1.3%)	14 (1.8%)		10 (0.7%)	7 (1%)	
Users	6 (0.7%)	7 (0.9%)	0.83	3 (0.4%)	3 (0.4%)	0.69	15 (1.1%)	6 (0.9%)	0.71
Intention to use substance in the coming 3 months—among users									
Intention to drink alcohol									
No	682 (84.7%)	670 (87.7%)		680 (85.6%)	666 (85%)		1171 (86.5%)	575 (84.9%)	
Yes	123 (15.3%)	94 (12.3%)	0.09	114 (14.4%)	118 (15%)	0.7	183 (13.5%)	102 (15.1%)	0.34
Intention to smoke cigarettes									
No	778 (96.9%)	745 (97.4%)		764 (96.3%)	764 (97.3%)		1294 (95.8%)	657 (96.3%)	
Yes	25 (3.1%)	20 (2.6%)	0.55	29 (3.7%)	21 (2.7%)	0.27	57 (4.2%)	25 (3.7%)	0.55
Intention to smoke marijuana									
No	785 (97.8%)	751 (98.4%)		785 (99.2%)	769 (98.8%)		1315 (97.3%)	666 (98.2%)	
Yes	18 (2.2%)	12 (1.6%)	0.33	6 (0.8%)	9 (1.2%)	0.42	37 (2.7%)	12 (1.8%)	0.18

on a number of instances, which further support these findings. It is valuable to note that the replication of many of the results in favor of the intervention groups (with different degrees of significance) across the three countries from the same geographic region potentially adds further value to the consistency of the findings. This was true despite the difference in modality of implementation of the study in Serbia (the comparison group enrolled a year after the intervention—for reasons explained in methodology), the results remained in the same direction as in the other two countries.

Previous studies of LQFSA identified dosage as a key element of successful implementation; in one such study, a threshold of 15 sessions per year was identified as the minimum for continuous implementation quality, with a higher number of sessions (between 25 and 40) being needed for better outcomes (Matischek-Jauk and Reicher 2015; Reicher and Matischek-Jauk 2015). Other research also indicated that there was also the possibility of an implementation threshold effect; that is, that after a certain point, programs may see a diminishing effect (Durlak and DuPre 2008).

Table 2 Relative difference (Delta analysis) in the prevalence of substance use during the last 30 days and intention of use during the coming 3 months (comparing pre- to post-test) and effect size (Cohen's *d*), comparing intervention to control groups in post-test

Country		Intervention relative difference pre- to post-test (95% CI)	Control relative difference pre to post-test (95% CI)	Cohen's *d* method Effect size (95%CI)
Substance used last 30 days				
Montenegro	Drinking alcohol	0.3% (− 3.1%, 3.7%)	3.3% (0.9%, 5.7%)	− 0.09 (− 0.19, 0.01)
	Smoking cigarettes	1.8% (0.9%, 2.7%)[*]	3.0% (2.1%, 3.9%)[**]	− 0.07 (− 0.18, 0.03)
	Smoking marijuana	0.7% (0%, 1.4%)	3.8% (3.2%, 4.4%)[**]	− 0.15 (− 0.25, − 0.05)
FYRO Macedonia	Drinking alcohol	5.4% (3.1%, 7.7%)[**]	6.8% (4.3%, 9.3%)[**]	− 0.02 (− 0.12, 0.08)
	Smoking cigarettes	− 0.5% (− 1.7%, 0.7%)	1.7% (− 1.7%, 0.7%)	− 0.15 (− 0.26, − 0.05)
	Smoking marijuana	0.3% (− 0.1%, 0.7%)	1.5% (− 0.1%, 0.7%)[**]	− 0.08 (− 0.18, 0.02)
Serbia	Drinking alcohol	3.4% (1.5%, 5.3%)[*]	9% (6.6%, 11.4%)[**]	0.03 (− 0.05, 0.11)
	Smoking cigarettes	1.9% (1.0%, 2.8%)[**]	2.2% (0.9%, 3.5%)[*]	− 0.06 (− 0.14, 0.02)
	Smoking marijuana	2.0% (1.4%, 2.6%)[**]	1.6% (0.9%, 2.3%)[*]	0.01 (− 0.07, 0.10)
Intention to use substances in the coming 3 months[a]				
Montenegro	Intention to drink alcohol	− 0.3% (− 2.9%, 2.3%)	5.5% (3.1%, 7.9%)[**]	0.14 (− 0.29, 0.02)
	Intention to smoke cigarettes	1.2% (0%, 2.4%)	3.2% (1.2%, 5.2%)[**]	0.15 (− 0.45, 0.15)
	to smoke marijuana	− 0.3% (− 1.3%, 0.7%)	2.3% (1.4%, 3.2%)[**]	0.06 (− 0.52, 0.64)
FYRO Macedonia	Intention to drink alcohol	4.8% (2.3%, 7.3%)[**]	6.1% (3.6%, 8.6%)[**]	− 0.02 (− 0.12, 0.08)
	Intention to smoke cigarettes	− 1.9% (− 3.2%, − 0.6%)[*]	2.2% (1.1%, 3.3%)[*]	− 0.51 (− 0.85, − 0.17)
	Intention to smoke marijuana	1.0% (0.4%, 1.6%)	1.0% (0.2%, 1.8%)	− 0.08 (− 0.18, 0.02)
Serbia	Intention to drink alcohol	6.2% (4.4%, 8.0%)[**]	7.4% (3.7%, 11.1%)[**]	− 0.25 (− 0.37, − 0.12)
	Intention to smoke cigarettes	2.1% (1.0%, 3.2%)[*]	4.6% (3.2%, 6.0%)[**]	− 0.23 (− 0.48, 0.01)
	to smoke marijuana	1.3% (0.4%, 2.2%)	1.8% (0.8%, 2.8%)[*]	− 0.16 (− 0.58, 0.26)

[a] Among users only

[*] *p* < 0.05

[**] *p* ≤ 0.01

Due to project implementation needs, the intervention was rolled out during the span of one academic year. Accordingly, the series of five trainings, needed to cover the entire cohort of teachers and schools chosen for piloting, could only be initiated at the beginning of the school year due to lack of availability of teachers for such training during the summer holidays. This made it very difficult to implement all 40 sessions of the program within the available number of weeks within the scholastic year, as the sessions were originally intended to be given weekly. A median of 27 sessions per country were implemented. Despite the lack of ability to undertake the entire program, the intervention still carried a favorable prevention effect in contrast to the comparison, indicating that most likely this threshold number of session was reached.

Moreover, the success of Lions Quest, and the associated student outcomes, is largely dependent on the quality of implementation within the classroom. While no formal assessment of the quality of implementation was undertaken, there seems to be a fidelity in the implementation of the sessions.

This conclusion was noted due to the favorable intervention group outcomes, despite receiving a lower number of sessions than originally intended, per the aforementioned reasons. Such results are in line with the previous research showing that a good outcome can still be reached with a fewer number of sessions, as long as a minimum number of sessions are provided with good fidelity (Matischek-Jauk and Reicher 2015; Reicher and Matischek-Jauk 2015).

The current study addresses a gap in the literature by testing the implementation of life skills programs in achieving drug prevention outcomes in the region of South Eastern Europe. The results are in line with the reports published elsewhere with the program, and also in line with the recent reviews of evidence, including the one on which the UNODC-WHO International Standards on Drug Use Prevention is based (United Nations Office on Drugs and Crime (UNODC) and World Health Organization (WHO) 2018). As substance use remains a significant public health challenge for the South East European region (European Monitoring Center for

Table 3 ANOVA analysis post-intervention outcome

		Montenegro			FYRO Macedonia			Serbia		
	Study group	N at t1	t1 %	p value at t1	N at t1	t1 %	p value at t1	N at t1	t1 %	p value at t1
Substance use in the last 30 days[a]										
Drinking alcohol	Intervention	101/738	13.7		130/736	17.7		209/1188	17.8	
	Control	121/732	16.5	0.13	151/730	20.7	0.14	216/1060	20.4	0.09
Smoking cigarettes	Intervention	25/740	3.4		18/736	2.4		55/1187	4.6	
	Control	34/731	4.6	0.21	40/728	5.5	< 0.01	56/1048	5.3	0.44
Smoking marijuana	Intervention	12/736	1.6		5/736	0.7		37/1183	3.1	
	Control	33/731	4.5	< 0.01	14/727	1.9	0.03	26/1044	2.5	0.37
Substance use—intention to use in the coming 3 months[b]										
Intention to drink alcohol	Intervention	111/739	15		141/734	19.2		234/1188	19.7	
	Control	130/731	17.8	0.15	154/729	21.1	0.36	238/1056	22.5	0.10
Intention to smoke cigarettes	Intervention	32/738	4.3		13/736	1.8		74/1178	6.3	
	Control	42/729	5.8	0.21	36/727	4.9	< 0.01	88/1054	8.3	0.06
Intention to smoke marijuana	Intervention	14/736	1.9		13/733	1.8		47/1173	4	
	Control	28/726	3.9	0.02	16/727	2.2	0.56	38/1050	3.6	0.63

[a] Scale 0 to 1, where 0 is equivalent to no usage last 30 days and 1 means reported using substance during the last 30 days

[b] Scale 0 to 1, where 0 is equivalent to no intention to use substance in the coming 3 months and 1 means intention to use substance in the coming 3 months

Drugs and Drug Addiction 2016), it is valuable to have affirmative results of methods found efficacious elsewhere for preventing substance use; these results might be transferable and effectively used within the existing education infrastructure in the concerned countries and region.

While the effect size statistical interpretation is ranging between small at worse and medium at best, it is important to reflect on the practical and meaningful interpretation of this data from a policymaking perspective, as this was the main objective of the UNODC-LCIF collaboration. Such positive outcomes are elemental in reassuring the policy makers who supported the pilot of the transferability, feasibility, and positive added value of such programs. This opens the door for promoting evidence-based interventions as part of the action plans articulating the drug prevention strategy, rather than relying on non-evidence-based responses. Fostering such acceptability towards evidence-based prevention among the national policymakers is the core objective of this project. These decision-makers often act as "gate keepers" in the field of health policies and substance use prevention, influencing the "culture of prevention," the support towards evidence-based policies and practices such as the Lions Quest program, and a

Table 4 Multilevel model-adjusted odds ratio post-intervention

Characteristics Substance use	Montenegro Intervention group (Ref); p value	FYRO Macedonia Intervention group (Ref); p value	Serbia Intervention group (Ref); p value
Alcohol			
Had alcohol during the last 30 days	1.13 (0.92–1.40); 0.23	1.17 (0.95–1.44); 0.94	0.93 (0.76–1.13); 0.46
Intention to drink—next 3 months[a]	0.84 (0.58–1.21); 0.34	1.33 (0.91–1.93); 0.14	1.17 (0.84–1.64); 0.35
Cigarettes			
Smoking cigarettes last 30 days	1.25 (0.81–1.94); 0.31	**1.97 (1.30–3.00); < 0.01**	1.11 (0.75–1.63); 0.61
Intention to smoke cigarettes—next 3 months[a]	0.64 (0.30–1.37); 0.25	1.09 (0.51–2.34); 0.82	**3.52 (1.58–7.80); < 0.01**
Marijuana			
Smoking marijuana—last 30 days	**2.30 (1.31–4.03); < 0.01**	**2.51 (1.03–6.07); 0.04**	0.89 (0.51–1.55); 0.68
Intention to smoke marijuana—next 3 months[a]	3.18 (0.66–15.33); 0.15	1.00 (0.15–6.53); 0.99	0.59 (0.18–1.92); 0.38

[a] The analysis was conducted among participants that have been reported as "ever users" at t0

scientifically grounded testing of prevention programs in general. This is the main objective of the larger UNODC prevention work (Campello et al. 2016; United Nations Office on Drugs and Crime (UNODC) 2018). Moreover, it offers the opportunity to avail programs effectively instilling social, emotional, and life skills in students and building resilience potentially going beyond substance use behaviors.

It is worth noting that the results of this pilot have already encouraged the Ministries of Education of these countries to consider adopting such programs in their national prevention strategies within school settings. Furthermore, the positive results of this collaborative initiative to pilot evidence-based programs have already encouraged the expansion of the program to benefit Guatemala, El Salvador, Ivory Coast, and Bosnia-Herzegovina.

Moreover, the experience generated from the three countries that are the subject of this manuscript could serve the purpose of better refining the process of implementation in the new countries to pilot LQSFA. One major difference in modality of the roll out is that the intervention could be spread over the span of two academic years instead of one; this would ensure higher chances of the completion of the 40 sessions in the intervention group. The combined experience and lessons learned from the implementation of LQSFA and the revised process of roll out in the new countries would make a more powered randomized clinical trial possible that would better address the impact of LQSFA and potentially explore the mediating parameters and variables explaining this impact in South East Europe and other regions.

Limitations of this Study

The main limitation of this study is that the intervention and the comparison group were not fully randomized. Moreover, as previously mentioned, the rollout design of this study made it difficult to implement all 40 sessions of LQSFA in any of the schools. There are further limitations in study design that need to be considered. First, as the average age of the sample post-test was around 14 years of age, a longer follow-up (beyond 10 months) could have likely allowed for the generation of higher incidence of initiation of substances, which might have further strengthened conclusions. This was particularly true for the marijuana use indicators. Second, it was not possible to be sure of the exact follow-up rate of the students, nor could we accurately match the pre-test to the post-test questionnaires given the data was anonymized. These factors combined might have carried an effect on the pattern of positive findings being quite mixed with many null results. Such limitations in study design need to be accounted for by the reader of this manuscript while interpreting results. Despite these limitations, this pilot could still be considered an innovative study with very encouraging results as this is considered as the first study in South Eastern European schools to pilot such a standardized manualized school-based prevention program with trained school teachers.

Conclusions

The Lions Quest Skills for Adolescence seems to be a transferable program to the South East Europe Region. Moreover, the results of the pilot provided promising positive and congruent outcomes on preventing current use of alcohol, cigarettes, and marijuana among students. Interestingly, the intervention also seems to carry an effect on the intention of use of these substances in the next 3 months among current users. Such results were replicated across three different countries from South East Europe, which adds further corroboration of the findings. This is valuable especially given the lack of research on effective substance use prevention models coming from low- and middle-income countries, the mixed results derived from such programs, and the low coverage of evidence-based approaches registered worldwide. Moreover, this study paves the way to guide a potential future randomized clinical trial to further corroborate the results.

Compliance with Ethical Standards

Conflict of Interest The Lions Clubs International Foundation (LCIF) is the owner of the copyright to the Lions Quest program. Matthew Kiefer is the program manager for LCIF. He receives no commission or financial incentive for increased sales of the program.

Ethical Approval This was a pilot study, which was reviewed and approved by the Ministries of Education of the three countries, the representatives of the schools, and the UNODC Drug Prevention and Health Branch. Also, no personal identifiers, for the participating students, were collected. All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Informed Consent Permit for the study was received from the Ministries of Education, schools, and teachers. Informed assent was received, verbally, from the students, and their participation was voluntarily. No personal identifiers were collected and students were given the option to opt-

out by submitting the self-filled questionnaire blank, in case they prefer not to answer.

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