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## High-risk drug use among Palestinian adolescent refugees in the North West Bank Palestine

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### ABSTRACT

Palestinian adolescent refugees are at increased risk for behaviors that can lead to poor health outcomes, such as high-risk substance use. This research focuses on the prevalence of substance use and its relationship with depression among adolescent male refugees in Palestine's North-West Bank. A cross-sectional study was conducted in five of seven refugee camps to gather data using a proportional stratified sampling technique. A structured questionnaire-based interview was conducted to gather sociodemographic data, self-reported substance use, and depression scale information. Additionally, urine screening tests were used to detect the presence of different drugs in participants' urine samples. The final sample size was 386 refugee males; 24.0% were workers, and 13.7% worked previously. For self-reported substance use, 26.9%; 12.4%; 28.0%; 37.0%; and 60.4%, 2.6% of adolescents reported current users of cigarettes, e-cigarettes, waterpipe, coffee, energy drinks (ED), and alcohol, respectively. Moreover, 3.4% tested positive for at least one drug. The drugs that tested positive were as follows: PCP (5%), MDMA (1.8%), THC (1.6%), BZO (0.5%), and MET (0.5%). The adjusted logistic regression showed an increased risk of depression among workers (OR = 3.777;  $p$ -value = 0.008), cigarette smokers (OR = 2.948;  $p$ -value = 0.04), waterpipe smokers (OR = 4.458;  $p$ -value = 0.041), and coffee users (OR = 2.883,  $p$ -value = 0.046). In conclusion, Palestinian adolescent refugees are at increased risk for behaviors that can lead to poor health outcomes, such as high-risk substance use, including illicit drugs, alcohol use, tobacco smoking, and ED intake. The results of this study reveal alarming figures on drug use associated with depression in refugee camps which demand controlling interventions.

### KEYWORDS

Drug abuse; depression; Palestinian refugee adolescents; UNRWA; amphetamine; THC; Palestine

## Introduction

Young people in the occupied Palestinian territories are engaging in risky behaviors that can negatively impact their health. These behaviors include high rates of tobacco, alcohol, and drug use, sexual activity, and interpersonal violence (Damiri, Sayeh, et al., 2018; Glick et al., 2018; Van Hout et al., 2020). Currently, the most common substances used are cigarettes, waterpipes, alcohol, and illicit drugs, with a significant link to using energy drinks (ED) (Damiri et al., 2020). Cannabis, both natural and synthetic, is the most commonly used illicit drug, followed by prescribed drugs, amphetamine-type stimulants (ATS), and opioids (Damiri, Sayeh, et al., 2018; Damiri et al., 2020; Massad et al., 2016). Males and older youth in urban areas and refugee camps are at higher risk for drug-related risk behaviors (Glick et al., 2018). Drug use among children living in refugee camps is a particular concern due to easy drug access (Al-Afifi et al., 2020; Damiri, 2020; Damiri, Sayeh, et al., 2018; Damiri et al., 2020; Damiri & Daraghma, 2023; Massad et al., 2016). Poverty, crowdedness, limited public spaces, and lack of children and youth activities force some children to spend most of their time in the street outside their homes but regularly go to their families homes. In addition, they engage in work to get little income (Hutson et al., 2016; Damiri, Salahat, et al., 2018; Defense for Children International/Palestine Section [DCI], 2017). Refugee children may turn to cigarettes, alcohol, and substance abuse to cope with traumatic events and challenging social and economic situations (Damiri, Salahat, et al., 2018).

The United Nations Children's Fund (UNICEF) defined three types of street children: Street-living, street-working, and street-family children (Section DfCIP, 2007; UNICEF, 2010; Woan et al., 2013). While on the street, these children seek work, beg for money or handouts, play, hang around, or spend leisure time (Section DfCIP, 2007; UNICEF, 2010). Street-working children spend most of their time working on the streets to provide income for their families or themselves. These children have a home to return to and do not usually sleep on the streets. Street children are sometimes stigmatized and face various difficulties and maltreatment, including physical, psychological, and sexual abuse (Chimdessa & Cheire, 2018; Friedrich, 2013; Ibrahim et al., 2019; UNICEF, 2010).

Moreover, their education is frequently in jeopardy. Because street children are vulnerable to direct violence and exploitation, they are also vulnerable to direct delinquency. In addition, they may be either exposed to or directly involved in at-risk situations or illicit activities, particularly for the production and trafficking of drugs, smuggling, and drug users (Cumber & Tsoka-Gwegweni, 2015; Embleton et al., 2013; Woan et al., 2013).

Street children in low- and middle-income countries have high rates of substance abuse (Friedrich, 2013).

The “street children” phenomenon in Palestine manifests itself through the presence of children in the streets for long hours, working, wandering, begging, loitering, or playing. However, these children do not sleep on the streets. Their families are known to them, they have homes to go to, and they all maintain some level of relationship with their families (Section DfCIP, 2007).

The prevalence of drug use in the general population assesses the amount of drug use, while the likelihood of problem drug use is assessed by youth drug use (UNODC, 2010). Studies on substance use among children in the West Bank are rare, with most focusing on school children (Aziz et al., 2013; Damiri, Sayeh, et al., 2018; Damiri, Sandouka, et al., 2018; Damiri & Daraghma, 2023; Massad et al., 2016). These studies do not specifically address street children and their relationship with mental health. Moreover, drug-related mortality and morbidity are the most critical indicators for understanding the drug use issue’s scope and discovering the extent of substance abuse among Palestinians. A Palestinian study revealed that 55.0% of youths have depression symptoms (Wagner et al., 2020). Another study revealed that 40% of refugees suffer from depression (Kaya et al., 2019). However, no relevant studies have investigated the association between drug use and depression among Palestinian refugee camps. This study highlighted the prevalence and factors associated with substance use among Palestinian street children and its association with depression. Our main objective was to address all forms of drug use, including underage use of legal substances, inappropriate use of legally obtained substances like tobacco and energy drinks, and illegal drugs like cannabis, opioids, or alcohol. We also described the association of substance use with depression among a community-based sample of refugee children on the street in the north of Palestine.

## **Methodology**

### ***Design, setting, sample size, and sampling technique***

From September to November 2022, a cross-sectional study was conducted in refugee camps in the north of the West Bank, Palestine. The study aimed to assess substance use among street refugee adolescents  $\geq 13$  years and cover all geographical and demographic categories of the Palestinian population in the north of the West Bank. Seven refugee camps are in the north of the West Bank, spread across three governorates. The study used a proportional stratified sampling technique to select a representative sample. Five camps were randomly selected to cover all three governorates,

and a proportional sample size was calculated for each camp. Children on the street are challenging to locate as most street-working children have mobile work. In order to give the street children an equal chance to participate in this study, the study area in each camp was divided into two clusters (sampling units). Male refugee street children aged 13–17 were invited to face-to-face interviews. Adolescents were chosen using convenience sampling. Subjects were excluded if they were under 13 years old, refused to give urine samples, had difficulty understanding or communicating, had a major debilitating illness, or had participated in the pilot study. The expected research population size in each camp is 500–2000 adolescents. The expected sample size for each camp is 42–55 adolescents based on a 3.5% proportion of drug use among children in the West Bank (Damiri, Salahat, et al., 2018), 95% confidence interval, and 5% precession.

### ***Ethical approval***

The research was conducted with the approval of the Institutional Review Board at An-Najah National University in Palestine (Approval number: Ref: Med. August 2022/7). Children who struggle with addiction experience stigma and may even face abuse from their families. Participating in substance abuse studies that limit their involvement can further stigmatize and harm them. The main obstacle to subjects' participation is their apprehension of legal repercussions and lawsuits regarding written informed consent. To safeguard the privacy and confidentiality of participants, the use of illicit drugs in testing was not disclosed in the flyers or media. Instead, informed consent was obtained from adolescents by concealing the true purpose of the urine test to protect participants' rights and interests (Damiri & Daraghma, 2023). The consent did not mention the phrases drug abuse, addiction, misuse, illicit drugs, or illegal drugs (Damiri & Daraghma, 2023). Subjects were then provided with all the information they needed to make a voluntary and informed decision before conducting the study. They were informed they had the right to ascent or descent anytime without consequences. The privacy and confidentiality of participants and data were highly assured. Code numbers were used instead of names.

### ***Study tool, validity, reliability, and operational definitions***

Some children were expected to be illiterate or have difficulty reading and writing. Therefore, the study was conducted through a structured interview based on the questionnaire. Children who agreed to participate in the

study were interviewed in the Committee Services for Refugee Camps offices or a mobile clinic.

The questionnaire was divided into four sections: Section one included the background and sociodemographic data. We considered hard (hazardous) work for jobs that included a great deal of physical stress, dealing with dangerous equipment, manual handling, or transporting heavy loads. Those included working in agriculture, construction, or as carpenters (Driessen et al., 2009; Lutsey et al., 2008). In comparison, light work included jobs without physical risks, like working at restaurants, bakeries, or markets (Damiri, Salahat, et al., 2018; Hutson et al., 2016).

Section two included a self-reported substance abuse section. For substance abuse, a structured interview was constructed based on previously used questionnaires (Damiri, Salahat, et al., 2018; Damiri et al., 2020). The questionnaire was previously modified from the one used in the Monitor the Future Study and used in the European school survey project on alcohol and others (Hutson et al., 2016; Johnston et al., 2007). The questionnaire was modified and translated into Arabic, considered the native official language in Palestine, and translated back to English. A pilot study was conducted, and the questionnaire was revised to achieve highly valid and precise results. Each interview lasted about 20–30 min and was conducted privately and anonymously. Substance use in this study was defined as licit and illicit substances. Licit substances included tobacco smoking (cigarettes, waterpipes, and e-cigarettes), ED, coffee, and illicit substances without medical prescription and alcohol. European Monitoring Center for Drugs and Drug Addiction (EMCDDA) categorized the frequency of substance use into never, last-month (past few weeks), or last-year use. Last-month use is also called current use, and last-year use is called recent use. Illicit drugs included the substances seized or used in the West Bank by the Palestinian Anti-Narcotic Drugs Department (Damiri, Sayeh, et al., 2018).

Section three included urine test results for illicit drug use: Ecotest multi-Dip Test Panel and Acro Rapid Test were used as screening tools to evaluate the presence of drugs and their metabolites in urine samples. Both are rapid chromatographic immunoassays for qualitatively detecting multiple drugs and their urine metabolites. The first one evaluates the following ten illicit drugs: Amphetamine (AMP), Barbiturates (BAR), Benzodiazepines (BZO), Cocaine (COC), Marijuana (THC), Methadone (MTD), Methamphetamine (MET), Methylenedioxymethamphetamine (MDMA), Morphine (MOP), Opiate (OPI), while the other test evaluates these 15 illicit drugs: AMP, BAR, BZO, COC, THC, MTD, MET, MDMA, MOP, Oxycodone (OXY), Methadone metabolite (EDDP), Phencyclidine (PCP), Propoxyphene (PPX), Tricyclic Antidepressants (TCA), Buprenorphine (BUP). Both tests, which are compatible with healthcare professional use,

can detect any or all of these drugs when they are above the test's detection limit specified in the manual for each drug (Waived, 2019). The use of two different panels was due to the availability of specific numbers of each panel. However, we used both panels for some urine samples as a double-check step. Ecotest multi-Dip Test Panel was used for 234 samples, while Acro Rapid Test was used for 152 samples. A multiple drug user is a participant who reported or tested positive for at least two of the tested illicit drugs in his urine.

Section four included depressive symptoms and psychosomatic symptoms. Birleson Depression Self-Rating Scale (DSRS) assessed symptoms of depression in Children (Birleson et al., 1987). The DSRS is a self-rating scale that evaluates depressive symptoms in children and adolescents. It consists of 18 items related to depression in children. The scale is a way of understanding how children feel about things. Children were asked to rate their condition during the most recent 1-week period on a 3-point scale. The scores for the scale are 2 for most of the time, 1 for sometimes, or zero for never. The researchers explained to children that there is no right or wrong answer and that it is important to say how they have felt. The researchers read the statements neutrally, indicating no preference for what the children wish to hear. Then, the item scores are summed to give the total score. The DSRS cutoff score of 15 points is used as a risk of depression (Birleson et al., 1987; Fundudis et al., 1991). This cutoff point determined the percentage of children with clinically significant depressive symptoms. The Arabic version of DSRS was used in Palestine (Gaza Strip) and has been reported to have a good internal consistency (Cronbach's alpha = 0.8) (Kolltveit et al., 2012; Lange-Nielsen et al., 2012) and showed high reliability (0.89) and split half (0.81) (Thabet & Younis, 2017).

### **Data analysis**

Variables were described using means, standard deviations, and percentages wherever appropriate. One primary dependent outcome of interest was any illicit drug use (yes or no). Adjusted binary logistic regression models were used to evaluate the relative risk by generating the odds ratios (OR) and 95% confidence intervals (CI). Covariates used in the depression model were age (continuous variable), job (worker or without work), and the use of other licit substances, including cigarettes, waterpipe, e-cigarettes, drinking alcohol, ED, and coffee (yes or no for each substance). A  $p$ -value <0.05 was used as the significance level. All analyses were performed using IBM SPSS Statistics for Mac, version 21 (IBM Corp., Armonk, NY, USA).

## Results

A total of 484 refugee males aged 13–17 agreed to participate from the three governorates of North West Bank. However, 98 refused to give urine samples; the final sample size was 386 refugee males. [Table 1](#) describes the general characteristics of the participants. Most (87.3%) were school children, 9.1% did not go to school, 3.6% dropped out of school, 24.0% were working currently, 13.7% worked previously, and 69.9% of the workers worked hard type of work, 48.6% had stable jobs.

### *Psychoactive substances practice*

ED was the most frequently used substance, as 60.4% of adolescents used it in the last month, and 2.8% used it in the past 12 months. This was followed by coffee intake (37%) last month. The total use of alcohol was 2.6%. For tobacco smoking, 26.9% of the adolescents were cigarette smokers, 28.0% were waterpipe smokers, and 12.4% were e-cigarette smokers. Most cigarette smokers (75.7%) smoked cigarettes daily. The prevalence of daily use of other substances is as follows: 40.0% e-smoking, 30.3% waterpipes smoking, 57.2% coffee intake, 50.2% ED, and 10.0% alcohol use. Among users, 26.3% of cigarette smokers and 37.9% of e-cigarette smokers intended to quit smoking. In contrast, among non-users, the intention for future use was as follows: 10.8% for cigarette smoking, 6.3% for e-smoking, 10.4% for waterpipes smoking, 11.8% for coffee, 12.1% for ED, and 0.3% for alcohol. The mean initiation age of the substances was: cigarette smoking ( $11.8 \pm 2.1$ ), e-smoking ( $12.2 \pm 2.0$ ), waterpipe smoking ( $12.0 \pm 2.0$ ), coffee ( $11.1 \pm 2.4$ ), ED ( $11.4 \pm 2.0$ ), and alcohol ( $12.9 \pm 2.8$ ) ([Table 2](#)).

[Table 3](#) shows the frequencies of drugs that tested positive by the urine drug test. Thirteen participants (3.4) tested positive for at least one

**Table 1.** Sociodemographic characteristics of the participants.

Variable	<i>n</i>		<i>n</i> (%)
School enrollment	386	Students	337 (87.3)
		Dropped from school	14 (3.6)
		Did not go to school at all	35 (9.1)
Ability to read and write	386	No	81 (21.0)
		Work	386
Workplace	136	Never	240 (62.3)
		Working currently	93 (24.0)
		Previously worked	53 (13.7)
		City	53 (39.0)
Type of work	136	Village	25 (18.4)
		Camp	58 (42.6)
		Hard work	95 (69.9)
Job stability	146	Not hard	41 (30.1)
		Stable job	71 (48.6)
		Unstable job	75 (51.4)



**Table 2.** Frequencies of last use of psychoactive substances.

Habits	Use <i>n</i> (%)			Frequency of use <i>n</i> (%)					Intention to stop use <i>n</i> (%)	Intention to start <i>n</i> (%)	Initiation age (years ±SD)
	In the last month	In the past year	Never	Daily	Weekly	Monthly	Yearly				
Cigarette smoking	104 (26.9)	13 (3.4)	269 (69.7)	84 (75.7)	14 (12.6)	7 (6.3)	6 (5.4)	30 (26.3)	29 (10.8)	11.8 ± 2.1	
E-cigarette	48 (12.4)	21 (5.4)	317 (82.1)	26 (40)	20 (30.8)	15 (23.1)	4 (6.2)	25 (37.9)	20 (6.3)	12.2 ± 2.0	
Waterpipe	108 (28)	14 (3.6)	264 (68.4)	36 (30.3)	52 (43.7)	21 (17.6)	10 (8.4)	19 (16)	27 (10.4)	12.0 ± 2.0	
Coffee	143 (37)	11 (2.8)	232 (60.1)	87 (57.2)	50 (32.9)	13 (8.6)	2 (1.3)	12 (7.8)	27 (11.8)	11.1 ± 2.4	
Energy drinks	233 (60.4)	11 (2.8)	142 (36.8)	121 (50.2)	100 (41.5)	16 (6.6)	4 (1.7)	23 (9.6)	17 (12.1)	11.4 ± 2.0	
Alcohol	2 (0.5)	8 (2.1)	376 (97.4)	1 (10)	1 (10)	3 (30)	5 (50)	5 (71)	1 (0.3)	12.9 ± 2.8	

**Table 3.** Frequency of drugs screened by the urine test.

Drugs	<i>n</i> (%)
Two drugs positive	4 (1.0)
One drug positive	9 (2.3)
Negative	373 (96.6)
BZO	2 (0.5)
MET	2 (0.5)
THC	6 (1.6)
PCP	8 (5.0)
MDMA	7 (1.8)

**Table 4.** Depression screening test results.

Depressive screening questions	Always <i>n</i> (%)	Sometimes <i>n</i> (%)	No <i>n</i> (%)
1. I look forward to things as much as I used to	286 (74.1)	65 (16.8)	35 (9.1)
2. I sleep very well	301 (78.0)	66 (17.1)	19 (4.9)
3. I feel like crying	16 (4.1)	92 (23.8)	278 (72.0)
4. I like to go out to play	313 (81.1)	38 (9.8)	35 (9.1)
5. I feel like running away	16 (4.1)	39 (10.1)	331 (85.8)
6. I have lots of energy	346 (89.6)	34 (8.8)	6 (1.6)
7. I get tummy aches	17 (4.4)	132 (34.2)	237 (61.4)
8. I enjoy my food	341 (88.3)	38 (9.8)	7 (1.8)
9. I can stick up for myself	358 (92.7)	21 (5.4)	7 (1.8)
10. I think life isn't worth living	24 (6.2)	43 (11.1)	319 (82.6)
11. I am good at the things I do	348 (90.2)	29 (7.5)	9 (2.3)
12. I enjoy the things I do as much as I used to	302 (78.2)	39 (10.1)	45 (11.7)
13. I like talking with my family	361 (93.5)	19 (4.9)	6 (1.6)
14. I have bad dreams	17 (4.4)	136 (35.2)	233 (60.4)
15. I feel very lonely	17 (4.4)	41 (10.6)	328 (85.0)
16. I am easily cheered up	324 (83.9)	50 (13)	12 (3.1)
17. I feel so sad I can hardly stand it	8 (2.1)	39 (10.1)	339 (87.8)
18. I feel very bored	38 (9.8)	159 (41.2)	189 (49.0)
Depression screening	Yes <i>n</i> (%)	20 (5.2)	
	No <i>n</i> (%)	366 (94.8)	

substance, and four (1.0%) tested positive for more than one substance. The only positive drugs were PCP (5%); MDMA (1.8%); THC (1.6%); MET (0.5%); and BZO (0.5%). In addition, the following drugs tested negative in all samples: AMP, PPX, TCA, BUP, MOP, OXY, EDDP, COC, MTD, BAR, and OPI (Table 3).

### ***Illicit drugs practice and depression***

In Table 4, the depression screening showed that 5.2% of participants had significant depressive symptoms. In the depression scale, 6.2% of adolescents answered "Always" to the item assessing suicidal ideation, Item 10, while 11.1% answered "Sometimes". For item 1, "I look forward to things as much as I used to," 9.1% answered "No," and 16.8% answered "Sometimes". For item 2, "I sleep very well," 4.9% answered "No," while 17.1% answered "Sometimes." For item 17, "I feel so sad I can hardly stand it," 2.1% responded "Always," and 10.1% responded with "Sometimes".

**Table 5.** Crosstab of substance use and depression.

Variable name		Depression (Yes) <i>n</i> (%)	Depression (No) <i>n</i> (%)	Total <i>n</i> (%)	Odds ratio	95% Confidence interval	<i>p</i> -Value
Work	Yes	12 (60.0)	81 (22.1)	92 (23.9)	5.28	(2.07–13.35)	<0.001*
	No	8 (40.0)	285 (77.9)	293 (76.1)			
Cigarette smoking	Yes	13 (65.0)	104 (28.4)	117 (30.3)	4.67	(1.81–12.05)	0.001*
	No	7 (35.0)	262 (71.6)	269 (69.7)			
e-cigarette smoking	Yes	3 (15.0)	66 (18.0)	69 (17.9)	0.802	(0.228–2.817)	0.999
	No	17 (85.0)	300 (82.0)	317 (82.1)			
Waterpipe smoking	Yes	11 (55.0)	111 (30.3)	122 (31.6)	2.808	(1.132–6.966)	0.021*
	No	9 (45.0)	255 (69.7)	264 (68.4)			
Coffee intake	Yes	14 (70.0)	140 (38.3)	154 (39.9)	3.767	(1.415–10.029)	0.005*
	No	6 (30.0)	226 (61.7)	232 (60.1)			
Energy drink intake	Yes	16 (80.0)	228 (62.3)	244 (63.2)	2.421	(0.793–7.390)	0.153
	No	4 (20.0)	138 (37.7)	142 (36.8)			
Alcohol intake	Yes	3 (15.0)	7 (1.9)	10 (2.6)	9.050	(2.150–38.097)	0.011*
	No	17 (85.0)	359 (98.1)	376 (97.4)			

\**p*-Value is significant <0.05.

**Table 6.** Adjusted logistic regression for the risk factors associated with depression.

Depression (Yes) Reference category is No	Reference category	Odds ratio	95% Confidence interval		<i>p</i> -Value
			Lower	Upper	
Working (Yes)	No	3.777	1.418	10.057	0.008*
Cigarette smoking (Yes)	No	2.948	1.053	8.255	0.040*
Waterpipe smoking (Yes)	No	4.458	1.061	18.734	0.041*
Coffee intake (Yes)	No	2.883	1.017	8.217	0.046*
Alcohol intake (Yes)	No	3.468	0.706	17.033	0.112
Energy drink intake (Yes)	No	1.095	0.312	3.843	0.887
Drug use (Yes)	No	1.408	0.142	3.958	0.777

\**p*-Value is significant <0.05.

Univariate analysis to determine if any substance use is a risk factor for depression among adolescents showed a significant association between depression and working (OR, 5.28S; *p*-value <0.001), cigarette smoking (OR, 4.67; *p*-value 0.001), waterpipe smoking (OR, 2.808; *p*-value 0.021), coffee intake (OR, 3.767; *p*-value 0.005), and drinking alcohol (OR, 9.050; *p*-value 0.011). However, E-cigarette smoking and ED use were not associated with an increased risk of depression (Table 5).

Adjusted binary logistic regression for the association between substance use and depression revealed that worker adolescents (OR = 3.77; *p*-value = 0.008), cigarette smokers (OR = 2.94; *p*-value = 0.04), waterpipe smokers (OR = 4.458; *p*-value = 0.041), ad coffee users (OR = 2.883, *p*-value = 0.046) were more likely to be depressed. No significant association between depression and the other substances (*p*-value >0.05) (Table 6).

## Discussion

Early drug abuse is linked to later-life substance use disorders, and the most significant increases in destructive behavior appear to occur in older

teenagers and young adults (NCfDAS, 2023). Most Palestinian adults who meet the criteria for a substance use disorder began using substances as adolescents (Damiri, Sayeh, et al., 2018). This study investigated risk behaviors among Palestinian refugee adolescents, including smoking, alcohol, and drug use. In addition, the study focuses on high-risk drug use among Palestinian refugee adolescents and their related risk behaviors.

In agreement with previous studies, Palestinian adolescent refugees are at an increased risk for behaviors that can lead to poor health outcomes, such as high-risk substance use (Massad et al., 2016; Van Hout et al., 2020). In this study, 3.4% of the refugee male adolescent population had at least one drug tested positive in their urine, and 2.6% reported alcohol use. Although the prevalence of drug and alcohol use among Palestinian refugees is less than among other refugees (Horyniak et al., 2016; Salama et al., 2018; Vasic et al., 2021), these percentages are still high according to the Palestinian culture that stigmatizes and condemns these behaviors for Muslims. Moreover, it is still important to recognize the potential risks associated with underage use.

A recently published study indicated that 19.1% of Palestinian adult males tested positive at least for one drug, with the highest percentages among refugees (25.9%) and increased with increasing age (Damiri & Daraghma, 2023). A previous study targeting 10th-grade Palestinian schoolchildren among 877 students indicated that 2% used illicit drugs according to the self-reported questionnaire, and 0.3% intended to try them (Damiri, Salahat, et al., 2018). Another study revealed that 3.75% of male youth reported trying illicit drugs (Glick et al., 2018). These results indicated that the problem of drug use among adolescents in refugee camps is not in its early stages. Therefore, there is growing evidence that the drug use problem among refugees is increasing and alarming (Al-Afifi et al., 2020; Damiri, 2020; Glick et al., 2018; Massad et al., 2016), and no action has been taken to stop this problem.

Trafficking and use of new psychoactive substances in the West Bank and amphetamine Type substances (ATP), particularly a manufactured liquid methamphetamine in favor of marijuana, have been noticed since 2013 (Damiri, Sayeh, et al., 2018). A study conducted by United Nations Office on Drugs and Crime (UNODC) in 2017 showed that there is a significant prevalence of novel psychoactive substances (NPS) (“Sintetique Marijuana”) or hashish but also, and mainly, the use of prescription medications, antidepressants and painkillers, in high doses (methadone, morphine, phencyclidine, barbiturates, benzodiazepines, and synthetic opioids such as tramadol, and gabapentinoid drugs) in the West Bank and East Jerusalem (UNODC, 2017). The results of this study indicated the emergence of PCP use among adolescents in refugee camps. PCP comes at the top drug substance use, according to our study, followed

by MDMA and THC. Surprisingly, THC was the most commonly used illicit drug among the Palestinian population in the last decades until 2013 (Damiri, Salahat, et al., 2018). This shift in the type of substance used indicated that newly emerging drug use is increasing rapidly in the West Bank. PCP has a more potent and dangerous effect on the child's psychology and mental health. Moreover, it is a common behavior, called smoking wet, to use PCP in combination with THC (Gilbert et al., 2013).

Children exposed to nicotine, illicit drugs, and alcohol are more likely to have substance disorders and addiction later in adulthood (Ren & Lotfipour, 2019). Evidence suggested a higher risk of developing alcohol disorders if initiation of alcohol use was at ages 11–14 (Giustino et al., 2018). The early use of cannabis can also lead to lifetime use and can seriously impact depression, schizophrenia, anxiety, brain development, and suicidal behavior in children and youth. In the depression scale, a critical item to assess the presence of suicidal ideation was answered “Always” by 6.2% of adolescents, while 11.1% answered “Sometimes. In addition, early use of cannabis may have deleterious effects on neural development and later cognitive functioning (Duperrouzel et al., 2018; Fischer et al., 2020; Gobbi et al., 2019; Godin & Shehata, 2022). The type of the substance, the initiation age, and the multiple substances used were considered other important risk factors.

Adolescents and young adults with substance use disorders are more likely to develop physical and mental illnesses, a decline in overall health and well-being, and a potential for addiction (CfDCaP, 2023). Our findings align with previous studies and confirm that depression is common among Palestinian refugees (Kaya et al., 2019; Wagner et al., 2020). Whether smoking predicts depression or the opposite is controversial (Chaiton et al., 2009; Fluharty et al., 2017). A study among Syrian refugee youth in Jordan found an association between smoking and depressive symptoms which disappeared after adjustment of confounders (Kheirallah et al., 2020). In agreement with previous studies, the univariate analysis revealed that depressed adolescent refugees were more likely to be workers, cigarette smokers, waterpipe smokers, alcohol users, and coffee users (Benko et al., 2011; Kheirallah et al., 2020).

In contrast, the adjusted binary logistic regression results revealed that depressed refugee adolescents were more likely to be workers, cigarette and waterpipe smokers, and ED users, which aligns with other studies' findings (Abadi et al., 2020; Arnold et al., 2014; Byeon, 2015). These results indicate that tobacco smokers may suffer from behavioral and psychiatric conditions that further worsen their smoking habits and psychological health, stressing the importance of controlling tobacco smoking as it may endanger health in general. In addition, this study showed that around half of the adolescents reported being current tobacco smokers,

while at least two-thirds were ED users and 39.8% were coffee users. These results are consistent with the results of other studies among refugee adolescents in the West Bank (Damiri, 2020; Damiri et al., 2021; Glick et al., 2018; Jawad et al., 2016; Khader et al., 2009). However, among other refugees living in other countries, lower rates of tobacco smoking (14.9%) were established for Syrian male refugees in camps in Jordan (Kheirallah et al., 2020), and among Lebanese school-aged males, in which 22% of them were smokers (Jawad et al., 2015). It is also concerning that 75.7% of cigarette smokers smoke daily. The prevalence of daily use of other substances, such as e-smoking, waterpipe smoking, coffee intake, ED, and alcohol use, also highlights the need for increased awareness and prevention efforts. Previous studies showed high ED consumption and tobacco smoking prevalence in Palestinian refugee adolescents (Damiri et al., 2021). Their use was linked to the increased likelihood of metabolic syndrome, dyslipidemia, and central obesity, warranting attention (Damiri et al., 2021). Overall, the mean initiation age of these substances is also a cause for concern, with many adolescents starting young. It is encouraging to see that a significant portion of cigarette and e-cigarette smokers intended to quit smoking, with 26.3% of cigarette smokers and 37.9% of e-cigarette smokers expressing their desire to quit. However, it is important to note that some non-users still intend to use these substances in the future. It is crucial to educate and inform young people about the potential risks associated with substance use and encourage healthy habits and decision-making. The increased tobacco smoking among Palestinian adolescent refugees might be due to higher levels of depression and stress due to occupation compared to other countries (Shukri et al., 2023). Further investigation is required for the political and social reasons that could increase tobacco smoking among refugee children.

According to the Palestinian Central Bureau of Statistics, 6.2% of children in the West Bank are working either with or without a wage (Hildrum et al., 2007). Street children are vulnerable to risks, including working long hours for low wages, working at night, or without health or accident insurance due to frequent economic exploitation. Due to the harsh environment in which they are forced to survive, refugees are often characterized by aggressiveness, unstable emotional behavior, lack of concentration, constant rebellion against authority, mistrust of others, and sometimes abusive behavior toward other children, and quickly involved in fights (Newcomb et al., 1988; UNICEF, 2010). In this study, worker adolescents were at higher risk of being depressed. In agreement with our study, a previous systemic review showed an association between child labor and mental health problems attributed to low family income, daily working hours, and likelihood of abuse (Ibrahim et al., 2019). In addition, as depressed adolescents are more likely to be tobacco smokers, being paid

for work, they will be able to buy cigarettes without asking their families for money. Most children in this study work hard jobs, so they are vulnerable to all the risks mentioned above, especially substance abuse and depression, which synergistically worsen one's health. This suggests that there is an urgent need to address the problem of depression and cigarette smoking among working adolescents, as they are at a higher risk, and the need to educate refugees about mental health and associated risk factors.

We recommend strict policies about children handling these substances and establishing healthier community activities that distract the children from these substances. The labor code for children must be enforced. We recommend a legalization change for The Palestinian National Authority Anti-Smoking Law No. (Kaya et al., 2019) of 2005, which does not define the legal smoking age. There is a solid need to modify the law and introduce the Protection from tobacco act for children and young persons, which makes it illegal to sell any tobacco product to anyone below the age of 18 years. Moreover, more efforts are needed to develop more effective smoking prevention and cessation strategies and promote tobacco-free environments by local authorities. The United Nations Relief and Works Agency for Palestinian Refugees in the Near East (UNRWA) should develop age-targeted cessation programs and mental health and psychosocial support (MHPSS) clinics in all refugee camps for different age groups.

### ***Limitations and strengths of the study***

Our study has several limitations. This was a cross-sectional study, and therefore, the results should be interpreted cautiously as they did not test for temporality or establish causality. In addition, the study was limited to the north of the West Bank. Moreover, the female children were not included. Self-reported substance use could underestimate the results. A selection bias is possible because of the convenience sampling technique and the refusal rate. Moreover, the urine test does not detect some of the most used substances in the West Bank, like tramadol, ketamine, and synthetic THC. In addition, the test used to examine urine has a limited time frame to detect substances. Therefore, a negative result may not necessarily indicate drug-free urine. Therefore, the frequency of substance use may be underestimated in this sample, limiting the findings' generalizability. Moreover, the test does not distinguish between drug use and addiction. Despite these limitations, this first study focused on the Palestinians' adolescent substance use using urine tests and its association with depression, and the results of this study have several clinical impacts.

## Conclusion

Palestinian adolescent refugees are at an increased risk for behaviors that can lead to poor health outcomes, such as high-risk substance use, including illicit drug, tobacco smoking, and ED intake. Overall, the type of drugs used, the multidrug used, and the initiation age indicate that these drug users will suffer from drug dependency and several behavioral and psychiatric conditions. Other impacts include an increased prevalence of cardiovascular diseases, lung diseases, kidney function impairments, and endocrine dysfunctions. Despite the increased evidence of growing drug use among refugees in the last decade, no action was taken. We recommend developing a monitoring system for drug and related risk behaviors among youth in the region, specifically refugees. Given these substances' health and social effects, the UNRWA should adopt effective diagnostic methods for tracing and treating children using these substances. It's important to prioritize the implementation of effective clinical interventions to reduce the high risk of addictive behaviors among Palestinian refugees. This will help to prevent negative impacts on the health and wellbeing of vulnerable populations in the region. It's crucial that we take action and address this issue to ensure that those who are struggling with addiction and related risk behaviors receive the support they need from mental health providers, school teachers, parents, and others. Together, we can work toward a healthier and safer community for all. Finally, we recommend conducting additional studies about the association between psychoactive substances and depression and other mental health disorders for better evidence. We recommend further researching youth and young adult substance use and its association with various risks and behaviors.

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## Ethical approval

All procedures performed in this study involving human participants were in accordance with the ethical standards of An-Najah University's Institutional Research Ethics Board, approval reference number (Ref: Med. August 2022/7), and with the 2013 Helsinki Declaration.

## Informed consent

Informed consent was obtained from all participants.

## Authors' contributions

BD contributed to conceptualization, resources, methodology, formal analysis, supervision, and original draft preparation. MS, SK, MB, QS, IA, MH, and NK contributed to



methodology, data curation, and original draft preparation. AA and AH contributed to supervision. SB contributed resources. All authors have read and agreed to the published version of the manuscript.

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## Data availability statement

The datasets generated during and/or analyzed during the current study are available from the corresponding author upon reasonable request.

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