

# Association between coping strategies and drug use in a large cohort of students from a northern Italian University

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**Abstract.** *Background and aim of the work:* Illicit drug (ID) use/abuse represent a social and economic burden for most countries worldwide which, in spite of the efforts to prevent this phenomena, is often a growing habit especially in the young adults. Preventive measurements, are needed to reduce the adverse health and social consequences of ID use/abuse. *Methods:* This study investigated the relationship between coping strategies and ID use in students (N=12316) from the University of Parma, Italy. Information about the ID use in the past 12 months and coping strategies were collected with a cross-sectional research design using an online questionnaire. *Results:* More than 25% of the participants used ID in the past year; men were more likely to use drugs than female; the likelihood of using drugs was inversely related to age. The relationship between coping strategies and ID use was analyzed with a multilevel logistic model taking into account the within-department nested structure of data. Analysis revealed that transcendence-orientation and problem-orientation were associated with a reduction of the likelihood to have used drugs. Conversely, avoidance and positive attitude were associated with an increase of the likelihood to have used drugs. Finally, seeking social support revealed a positive but modest association with increasing in drug use. *Conclusions:* The ID use association factors identified in this study could be utilized by the appropriate institutions/authorities as a critical review in order to develop relevant public health policies and preventive measures aimed at minimizing the use of ID in this critical age group. ([www.actabiomedica.it](http://www.actabiomedica.it))

**Key words:** drugs, substance use, coping strategies, university students, multilevel analysis

## Introduction

The undesirable consequences of drug use and abuse have a great impact on the public health and represent social concerns. According to the 2017 report to the parliament on the state of drug addiction in Italy, approximately 1.65 billion euros of public resources were spent in drug related activities (1). For instance, 41.8% were for subjects assisted in addiction services, 37.7% for the treatment of drug-related diseases, and 13.6% for individuals in socio-rehabilitation structures (1). Sexually transmitted infections like

HIV and HCV (2), a common undesirable outcome of illicit drug users, also impact on the public health system as well as the car accidents associated to the driving under the influence of alcohol and/or illicit drugs which accounts for approximately 6% of the total car casualties (3,4).

The college years (framed approximately between 18-27 years old) often represents an individuals' lifetime critical period typically characterized by the separation from direct parental supervision and the transition to independence (5). Consequently, this age group is associated with a relative independence from

normative expectations and makes risky conduct more common (6). Thus, this life-stage offers a plethora of opportunities to explore with psychoactive substances like alcohol and illicit drugs (7) making students at high-risk of becoming illicit drug/s user (IDU) (5,8,9)

According to the latest 2019 Report of the European Monitoring Center for Drugs and Drug Addiction (EMCDDA) (10), an agency of the European Union (EU), which contains data and statistics on drug use in the 28 EU countries (plus Norway and Turkey), one third (33.3%) of the Italian population (aged 15-64 years) used illicit drugs at least once in his/her life and 10% has used them in the last year. This ranks Italy fourth, out of 30 states, behind France (44.8%), Denmark (38.4%) and Spain (35.2%). The EU average is 27.4%. As observed in other countries, the most widely used illicit drug was cannabis (9,11), whereas the use of cocaine and opioids, although common, was significantly lower (10). If 10% of the Italian population aged 15-64 years used cannabis in the last year, such percentage doubles (20.9 %) when considering the population aged 15 to 34 and became even higher (23.7%) when considering the 15-24 age group (10). In contrast, cocaine has been used by 1.2% of the population (aged 15-64) and by 1.7% among the younger aged 15-34 (10). Among them, the highest percentage of cocaine users (2.2%) was found when considering the 25-34 years old group, whereas only 1.2% of the youngest (aged 15-24) used cocaine during the last 12 months (10). The use of other illicit drugs (amphetamine, methoxyamphetamine (MDMA), etc.) was considerably lower than cannabis and cocaine and the percentage of users in the general population, as well as in the younger, was below 1%. Yet, Italy ranks as one of the EU countries with the highest percentages of users also for these less common substances (10).

There are several risk and protective factors for IDU by university students that have been identified and studied in the past. Among them, being male, smoking and alcohol drinking have been identified as risk factors (8,9,11), conversely, religion, living with their parents, and having better health and health awareness was associated with lower IDU (9,12). This wide range of risk/protective factors provided the rationale for the current study.

The aim of the study was to evaluate the association between being an IDU and socio-demographic (sex, age) variables but most importantly, the association between being an IDU and his/her corresponding coping strategy. The association factors between drug use and coping strategies could be utilized by the appropriate institutions/authorities in order to develop targeted social interventions aimed at generating recreations alternatives and opportunities for youth. In this context, the literature suggests knowledge gaps. Furthermore, only a few studies, some of which outdated, investigated university students' illicit drug/s use in Italy (13-17) and none of them associated IDUs with coping strategies.

#### *Coping and drugs use*

Coping can be defined as the cognitive and behavioral efforts made by people to manage internal or external demands from a stressful situation or condition (18). Lazarus and Folkman (1984) proposed two general coping strategies: emotion-focused and problem-focused. Emotional-focused copings are strategies attempting to reappraisal stressful situations in order to avoid/reduce negative emotions and feelings connected with such situations. In contrast, problem-focused copings represent strategies attempting to directly solve/remove the problems causing stress. In a sense, coping strategies are not conceptualized as individual stable traits, but rather as a process of adaptation in response to environmental changes. Thus, albeit people may prefer one strategy over the other, emotion-focused and problem-focused coping strategies are not mutually exclusive processes and both can result in either adaptive and maladaptive outcomes (19).

With respect to substance use, research has shown an important and strong link with coping strategies. It has been shown that emotion-focused coping and problem-focused coping are associated, respectively, with a more frequent and a less frequent use of illicit substances, especially among adolescents and young adults (20-23). For instance, Vargas and Trujillo (24) showed that female psychology students who adopted emotion-focused coping strategies were more likely to consume cannabis. Similarly, Capella and Adan (25)

showed that people with substance use disorders were more likely to adopt maladaptive coping strategies such as problem avoidance and social withdrawal (as well as reduced social support seeking). Accordingly, problem-focused coping strategies are considered as a protective factor against substance use while avoidance coping strategies are considered as a risk factor for the development and maintenance of substance use disorders (25–27).

We have noticed that previous results came essentially from specific populations (i.e., patients with substance use disorders, homeless or minority groups), thus the question about the association between coping strategies and illicit substance use in the general population remains partially unanswered. This study aimed at investigating the association between coping strategies and substance use in a large group of students from the University of Parma, a middle size northern Italian city. Our primary expectations were that problem-focused strategies would be linked with lower levels of substance use, while emotion-focused coping would be linked with higher levels of substance use.

## Method

### *Sample*

Participants to this study included 26841 students from a medium-size university (Parma, Italy), having an active student email account. That includes: undergraduate students as well as PhD students. Between September 2019 and March 2020, an anonymous questionnaire containing questions about illicit drug use and coping strategy behavior was sent by email (see supplementary material). Student could answer the questionnaire until the end of July 2020. We received response from 14103 participants (52.5%). Of them 483 participants were excluded from the study, because they claimed to use drugs for medical purposes. Further 1304 participants were also excluded from the study because their questionnaires were missing values on one or more of the considered variables (of those, 1283 participants had missing values on the whole coping measurement). The final sample size,

consisting of participants with complete questionnaire responses was 12316.

### *Procedure*

No exclusion criteria were applied before sending the anonymous questionnaire to the university students. The University of Parma has nine faculties. Data were considered as a whole but also stratified by the different faculties. The questionnaire was developed using the web-based software Limesurvey (Hamburg, Germany), formerly PHP Surveyor, and the link was sent to the university students' email address. To gain the students' trust and maintain their confidentiality, the questionnaire begins with a brief introduction which guarantees its anonymity, its voluntary nature, and that no personal information were linked to it. By participating to the study, the students authorized the use of their anonymously collected data, according to the University of Parma policy (article 9.2.j; EU general data protection regulation 2016/679 [GDPR]). The University of Parma internal questionnaire platform (Limesurvey), guarantee that personal data (defined as "any information relating to an identified or identifiable natural person" (Article 4(1) of the Ethics and data protection GDPR)) cannot be obtained. For such reason approval of the University of Parma Ethical Comity was not necessary.

The questionnaire includes a first set of seven questions about demographic information (age and sex) and information about drug and alcohol use and a second set regarding the coping strategies (see supplementary material for complete set of items).

### *Measure*

#### *Substance use in the last 12 months.*

We asked participants to indicate whether they used one or more of the substances listed in the questionnaire (amphetamines, buprenorphine, marijuana, cocaine, ketamine, methadone, methoxyamphetamine, opiates, other) in the past 12 months (0 = no, 1 = yes). After excluding participants using substances for medical purpose only, we computed a dichotomous score of substance use in which 0 represented people who never

used drugs in the past 12 months, and 1 represented people who used at least one of the nine substances for recreational purpose.

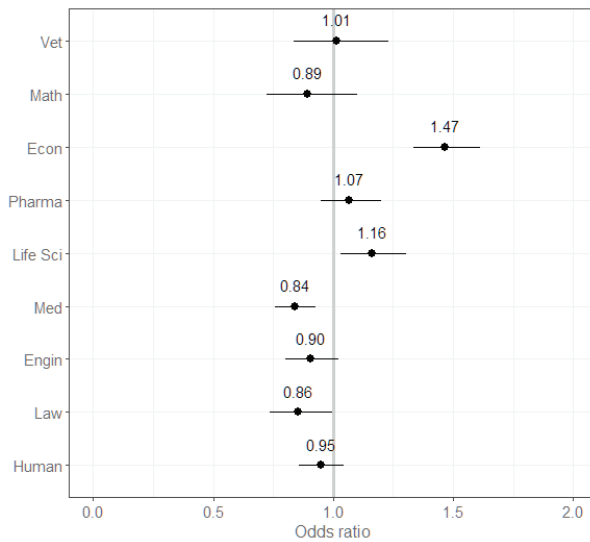
#### *Coping strategies.*

Coping was measured with the COPE-NVI-25 (28): the reduced Italian version of the Coping Orientation to Problem Experiences (29). The COPE-NVI-25

is a reduce version of the COPE-NVI (30) and comprises 25 items measuring five general coping strategies: Avoidance, Transcendent orientation, Positive attitude, Social support and Problem orientation (see supplementary material for the full list of items). Participants were asked to report to what extent, when encountering a problem, they perform each of the behaviors described by the items; responses were on a 6-point Likert-type scale (1 = I never do it, 6 = I almost always do it).

**Table 1.** Demographic characteristics and illicit drug/s use of the university students involved in the study. Data are stratified for university departments. Engin.: Engineering and Architecture; Human.: Humanities, Social and Cultural Disciplines; Med.: Medicine and Surgery; Econ.: Business Economics; Vet.: Veterinary; Math.: Mathematics, Physics and Informatics; Pharma.: Food and Drug Sciences; Life Sci.: Chemical, Life and Environmental Sustainability Sciences; Law: Jurisprudence, Political and International Studies.

	Departments									
	Human	Law	Engin	Med	Life Sci	Pharma	Econ	Math	Vet	Tot
Invited	5124	2118	3863	4719	2289	2843	4426	770	689	26841
Analysed	2185	887	1434	2323	1319	1402	1977	360	429	12316
Gender										
Female	1844	672	472	1543	881	980	1107	128	341	7968
Male	341	215	962	780	438	422	870	232	88	4348
Age										
18-21 years	858	362	633	793	695	663	884	190	228	5306
22-25 years	878	366	580	1064	487	591	877	122	158	5123
26-29 years	194	81	155	282	93	101	144	27	23	1100
>29 years	255	78	66	184	44	47	72	21	20	787
Drug use past 12 months										
No	1725	719	1145	1883	989	1075	1386	291	333	9546
Yes	460	168	289	440	330	327	591	69	96	2770
Amphetamines	11	4	6	12	5	4	12	1	3	58
Buprenorphine	2	2	1	2	3	6	4	0	0	20
Marijuana	446	165	281	434	325	320	585	69	96	2721
Cocaine	37	15	19	24	16	21	57	5	6	200
Ketamine	14	6	4	8	4	7	15	0	2	60
Metadone	0	0	0	3	3	0	4	0	0	10
Methoxyamphet.	16	3	7	11	7	9	20	0	1	74
Opiates	18	9	11	16	14	8	15	2	3	96
Other	17	12	15	11	23	17	27	0	2	124



**Figure 1.** Likelihood of have used drugs for each department. Bars represent the 95% confidence intervals (CI).

### Analysis plan

After a descriptive statistics presentation, zero-order correlations between variables will be assessed using Pearson's  $r$  to investigate multicollinearity. Subsequently, gender differences in coping strategies will be investigated with multivariate analysis of variance (MANOVA), while gender differences in the likelihood of substances use will be analyzed using the Chi-squared test.

Association between coping strategies and substance use in the past 12 months will be assessed considering nested structure of data. Considering that participants were from nine different departments, the latter will be considered as nesting variable in a

multilevel logistic model in which the reported past use of substances (0 = No) will be regressed on coping strategies, considering sex and age as covariates. All predictors, but sex (0 = woman), will be centered within departments (31).

## Results

### Gender differences on coping strategies and drugs use

Descriptive statistics are shown in table 1, while zero-order correlations between considered variables are shown in table 2.

As indicated, about 22% of the sample reported the use some type of drugs in the past 12 months. The most used coping strategies were positive attitude and problem orientation, while transcendent orientation and avoidance received lower ratings. It must be noted that correlations between coping strategies showed magnitudes ranging from small to large (32). However, while most of them showed moderate magnitude, none had values as high as to create multicollinearity concerns. This was a confirmation that coping strategies are relatively independent one to another and can be considered as separate, albeit related, predictors of substance use.

MANOVA revealed a significant effect of sex on coping strategies (Wilks'  $\lambda = 0.95$ ,  $F(5, 12,310) = 127.00$ ,  $p < .0001$ ). One-way results indicated that women scored higher than men on transcendent orientation ( $M = 1.97$ ,  $SD = 1.39$  vs.  $M = 1.78$ ,  $SD = 1.29$ ), social support ( $M = 3.99$ ,  $SD = 1.09$  vs.  $M = 3.50$ ,  $SD = 1.10$ ) and problem orientation ( $M = 4.31$ ,  $SD = 0.87$  vs.  $M = 4.27$ ,  $SD = 0.91$ ), while no gender difference was found for avoidance and positive attitude copings.

**Table 2.** Zero-order correlations and descriptive statistics of considered variables.

	M	SD	2	3	4	5	6	7
1 Avoidance	2.06	0.80	0.07**	-0.06**	0.01	-0.29**	0.01	0.08**
2 Transcendent orientation	1.91	1.36		0.08**	0.15**	0.11**	-0.07**	-0.17**
3 Positive attitude	4.22	0.88			0.25**	0.56**	0.00	0.01
4 Social support	3.82	1.12				0.33**	-0.21**	-0.03**
5 Problem orientation	4.30	0.89					-0.02	-0.07**
6 Sex (0 = women)	0.35	0.48						0.14**
7 Drug use (0 = no)	0.22	0.42						

Chi-squared test indicated that women were less likely than men to have used substances in the past 12 months ( $\chi^2(1) = 257.85, p < .001$ ).

### *Coping strategies and drug use*

Null model (i.e., the model in which only random intercept between departments was considered) indicated that department accounted for a little portion of variance in substance use (ICC = 0.01). However, this model appeared to account for a higher percentage of variance than the model in which data were considered as not nested ( $\chi^2(1) = 70.06, p < .001$ ); consequently, we maintained departments as a nested variable. Random coefficients for each department are shown in Figure 1 (expressed in odds ratios).

As shown, students from medicine and law were less likely to have used drugs in the last 12 months when compared to students from economics and life sciences. In contrast, students from other departments showed a similar likelihood to have use drugs in the past 12 months.

The full model revealed significant results for all considered variables (see table 3).

Controlling for gender and age, avoidance, positive attitude and social support, increased the likelihood to use substances (26.5%, 22.2% and 5.1% respectively), while transcendent orientation and problem orientation reduced the likelihood to use drugs (31.6% and 23.7% respectively). Regarding covariates, net of the effect of coping strategies, male participants were twice as likely to have used drugs than female

participants, while young students were more likely to use substances than the oldest.

### **Discussion and conclusion**

The study aimed at analyzing the relationship between coping strategies and the likelihood of using drugs in a large students' population from a medium-size university in northern Italy. To the best of our knowledge, this is the first study investigating the association between coping strategies and illicit drugs use in a non-clinical setting with a relatively large sample of young adults. Noteworthy, we did not consider substance use as a maladaptive coping strategy per se, rather, we tried to investigate whether the extent to which coping strategies are routinely used can be related to drugs use. Overall, our findings confirmed some of the previous literature results: men and younger students were more likely to have used drugs in the past year (11). Moreover, male participants were less likely than female participants to use transcendent and social support coping strategies. This seems to confirm that men and women are likely to engage in gender-role consistent coping strategies such as religiosity and communal engagement (i.e., social support seeking). Accordingly, no gender differences appeared on gender-role unrelated coping strategies such as avoidance and positive attitude. Considering the likelihood of using drugs, and net of gender and age of participants, results indicated that coping strategies have different and specific associations with drug use. Both transcendence orientations (i.e., to pray and/or to seek

**Table 3.** Fixed effects of coping strategies, sex and age on the likelihood to have used drugs in the last 12 months.

	<b>Estimates (logit)</b>	<b>SE</b>	<b>Z</b>	<b>OR</b>	<b>95%CI</b>	
Intercept	-1.680	0.088	-19.16 ***	0.186	0.157	0.221
Avoidance	0.235	0.029	8.030 ***	1.265	1.195	1.340
Transcendent orientation	-0.379	0.022	-17.086 ***	0.684	0.655	0.715
Positive attitude	0.201	0.032	6.371 ***	1.222	1.149	1.300
Social support	0.050	0.022	2.253 *	1.051	1.007	1.098
Problem orientation	-0.204	0.034	-6.098 ***	0.815	0.763	0.871
Sex (0 = men)	0.774	0.049	15.761 ***	2.168	1.969	2.386
Age	-0.200	0.029	-6.952 ***	0.818	0.773	0.866

God's help) and problem orientation (i.e., increasing commitment with problem solving attempts) were negatively related with drug use. Considering that problem orientation and transcendent orientation are regarded, respectively, as primary and secondary coping strategies (i.e., problem-focused and emotion-focused), it seems that both contribute in reducing the likelihood of using illicit substances. Conversely, both avoidance (i.e., attempt to avoid stress or problem) and emotion-focused positive attitude (i.e., I learn to live with the problem, I'm looking for something positive in what happened) were associated with substance use. Thus, we might argue that the use of drugs might be increased in students who are trying to avoid (i.e., distancing oneself from the stressor) or reappraise the problem, as the effect of illicit substances is believed to temporarily relieve emotional burden. Finally, social support was associated to an increase in the likelihood of using drugs, yet, its effect was rather small. We might hypothesize that seeking social support can, in some cases, increase the likelihood of drug sharing opportunities and thus increase the likelihood of using drugs (33). On the other hand, we might speculate that social support would work actively in helping people to manage the stressor and then reduce the likelihood of using substances. This double effect could explain the low association between social support and the use of drugs.

Before concluding, some limits of this study must be acknowledged. First, the correlational nature of our research prevented us to infer causal relationship between variables. It is indeed possible that people who used drugs in the past year were more likely to use different coping strategies with respect to those who did not use drugs. However, theoretical reasons seem to make the reverse path of relations more plausible. Another limit was the fact that we did not ask for current use of drugs, focalizing instead on the past 12 months. The choice was motivated by the fact that, in such type test, asking for intimate/confidential information, a question regarding the current drug use could have been interpreted as too confidential leading students to insincere answers that could affect the whole test. Conversely, we thought that a

question about the last 12 months would be perceived as a request for a more general information to which students would respond honestly.

Future research should focalize on these aspects and in particular the causal relations between coping strategies and use of drugs. Despite these shortcomings that can limit the generalizability of our results, we believe that the wide sample size and the statistical procedures accounting for the nested structure of data strongly increased the robustness of the findings.

In conclusion, our results seem to confirm that the way people are used to respond and adapt to the environment's demands is associated with the likelihood of using drugs, at least in university students. Specifically, the more one is incline to either focalize on his/her own abilities to face problems (i.e., problem orientation) or seek for a divine intervention, the less he/she would be likely to use drugs. In contrast, the more he/she is oriented to either avoid to face problems or reappraise the problems, the more they will be likely to use drugs. Social support appears to be a little "borderline" in this regard, albeit results suggested that it might contribute slightly to the use of substances.

**Ethical approval:** By participating to the study, the students authorized the use of their anonymously collected data, according to the University of Parma policy (article 9.2.j; EU general data protection regulation 2016/679 [GDPR]).

**Conflicts of interest:** Each author declares that he or she has no commercial associations (e.g. consultancies, stock ownership, equity interest, patent/licensing arrangement etc.) that might pose a conflict of interest in connection with the submitted article.

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Received: 20 May 2021

Accepted: 7 June 2021

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## APPENDIX

## Supplementary material

## Drug use questionnaire (Italian version, used in the study)

1. Sesso	Maschio		Femmina	
2. Età (anni)	18-21	22-25	26-29	>29
3. Hai mai fatto uso (ricreativo oppure per uso medico) di una o più delle seguenti sostanze stupefacenti? amfetamine, buprenorfina, cannabinoidi, cocaina, ketamina, metadone, metossianfetamine, oppiacei	Si		No	
4. Hai mai assunto questo tipo di droga? Se sì per quale motivo?				
Amfetamine	medico		ricreativo	
Buprenorfina	medico		ricreativo	
Cannabinoidi	medico		ricreativo	
cocaina	medico		ricreativo	
ketamina	medico		ricreativo	
metadone	medico		ricreativo	
metossianfetamine	medico		ricreativo	
oppiacei	medico		ricreativo	
5. Hai assunto questo tipo di droga negli ultimi 12 mesi?				
Amfetamine	SI		NO	
Buprenorfina	SI		NO	
Cannabinoidi	SI		NO	
cocaina	SI		NO	
ketamina	SI		NO	
metadone	SI		NO	
metossianfetamine	SI		NO	
oppiacei	SI		NO	
6. A che età (anni) hai assunto per la prima volta questo tipo di droga?				
Amfetamine	Mai	<15	15-20	>20
Buprenorfina	Mai	<15	15-20	>20
Cannabinoidi	Mai	<15	15-20	>20
cocaina	Mai	<15	15-20	>20
ketamina	Mai	<15	15-20	>20
metadone	Mai	<15	15-20	>20
metossianfetamine	Mai	<15	15-20	>20
oppiacei	Mai	<15	15-20	>20

**Drug use questionnaire (English translation)**

1. Sex	Male		Female	
2. Age (years)	18-21	22-25	26-29	>29
3. Have you ever used (either for recreational or medical use) one or more of the following drugs? amphetamines, buprenorphine, cannabinoids, cocaine, ketamine, methadone, methoxianphetamines, opiates	Yes		No	
4. Have you ever used this type of drug? For which reason?				
Amphetamines	medical		recreational	
Buprenorphine	medical		recreational	
Cannabinoids	medical		recreational	
Cocaine	medical		recreational	
Ketamine	medical		recreational	
Methadone	medical		recreational	
Methoxianphetamines	medical		recreational	
Opiates	medical		recreational	
5. Have you used this type of drug during the last 12 months?				
Amphetamines	Yes		No	
Buprenorphine	Yes		No	
Cannabinoids	Yes		No	
Cocaine	Yes		No	
Ketamine	Yes		No	
Methadone	Yes		No	
Methoxianphetamines	Yes		No	
Opiates	Yes		No	
6. Which age (years) you first used this type of drug?				
Amphetamines	Never	<15	15-20	>20
Buprenorphine	Never	<15	15-20	>20
Cannabinoids	Never	<15	15-20	>20
Cocaine	Never	<15	15-20	>20
Ketamine	Never	<15	15-20	>20
Methadone	Never	<15	15-20	>20
Methoxianphetamines	Never	<15	15-20	>20
Opiates	Never	<15	15-20	>20

**COPE TEST-NVI-25 (English translation)**

1. I look for advice from someone
2. I learn how to live with the problem
3. I focus on dealing with the problem and put other things aside if necessary
4. I don't do much to solve the problem
5. I try to prevent other things from interfering with my efforts to address the problem
6. I look for something positive in what happened
7. I refuse to believe this has happened
8. I seek help from God
9. I do what needs to be done, one step at a time
10. I talk to someone in order to do something concrete to solve the problem
11. I pray more than usual
12. I try to learn something from this experience
13. I try my best to act on the situation
14. I try to find reassurance in my religion
15. I ask people how they have acted in similar situations
16. I try to use this experience to improve as a person
17. I act as if it never happened
18. I look for moral support from friends and family
19. I put my hope in God
20. I think hard about what moves to take to address the problem
21. I recognize there is nothing I can do about it and I abandon any attempt to act
22. I tend to fantasize to distract myself
23. I accept the situation as it is
24. I try to get used to the idea that it happened
25. I look for someone's understanding and solidarity