Assessment of campus community readiness for tailoring implementation of evidence-based online programs to prevent risky substance use among university students in Germany

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1 *Original Research*

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18

37   **Abstract**

38   Research suggests that online interventions preventing risky substance use can improve

39   student health. There is an increasing interest in transferring evidence-based online programs

40   into university health promotion practice. However, little is known about how to best tailor

41   the implementation process to capacities and context of individual universities. The purpose

42   of this study was to assess the level of readiness (capacity) of German universities

43   concerning the implementation of evidence-based online programs for risky substance use

44   prevention employing an adapted Community Readiness Assessment (CRA) and to develop

45   tailored action plans for implementation. The CRA involved 43 semi-structured interviews

46   with key persons at ten German universities. The interviews addressed five dimensions

47   (knowledge of efforts, leadership, community climate, knowledge of the issue, resources) at

48   nine possible readiness stages (no awareness – ownership) and additional contextual factors.

49   Overall, readiness for implementing online interventions across universities was rather low.

50   Universities readiness levels ranged between the denial stage with a score of 2.1 and the

51   pre-planning stage with a score of 4.4. University-specific readiness was very heterogeneous.

52   Based on the results of the CRA, universities received feedback and options for training on

53   how to take the necessary steps to increase readiness and to prepare program implementation.

54   The adapted version of the CRA was well suited to inform future implementation of

55   evidence-based online programs for the prevention of risky substance use at participating

56   universities.

57   **Keywords**

INTRODUCTION

The majority of university students are in the developmental stage of "emerging adulthood" as defined by Arnett [1]. In this developmental stage, young adults tend to engage in high levels of sensation-seeking actions, such as substance use [2, 3]. Allen and colleagues [4] found that the university setting is a high-risk environment for substance use due to the opportunity to use. These findings support previous evidence suggesting a high prevalence for substance use among university students, e.g. an 18% prevalence of nonmedical use of prescription stimulants among first year college students [5-7]. In Germany, the 30-day prevalence of binge drinking among 18- to 25-year-olds was 38.0% and the prevalence of frequent binge drinking was 9.7% in 2015. Furthermore, 34.5% and 7% of young adults in this age bracket reported having used illicit drugs in their lifetime and during the past month, respectively [8]. Despite these numbers, only 1.5% of German university students reported alcohol or drug problems which indicates a low awareness of the issue at hand [9]. The negative consequences of substance use and excessive drinking are manifold, including reduced academic performance and damages to students' health and safety [10-16]. To conclude, there is a need for implementing substance use prevention programs targeting students in the university setting in Germany [10, 13, 17-19].

During the last years, considerable progress has been achieved in the research area of campus-based prevention of risky substance use [20-23]. Numerous online interventions have been identified as effective for the prevention and/or reduction of risky substance use in various countries. In Germany, three different online substance use prevention programs, as well as a peer counselling program for university students, were developed and evaluated under scientific conditions in recent years [24-27]. While effects could be demonstrated for two of these online programs in controlled intervention trials, the systematic implementation and dissemination of such programs remain challenging [28]. It is known that the transfer of evidence-based programs to practical settings is a long complex process [29, 30]. Frequently,

considerable resources are invested to develop and evaluate new interventions to prevent health risks and to promote health. However, only a small part of the range of products is translated for practitioners in the field of health promotion or for policy makers so that they can implement them in various settings [31, 32]. The investigation of potential causes and influencing factors of this "research-practice gap" has been well described in the literature [30, 33].

Furthermore, there is little research investigating the role of contextual factors influencing implementation and dissemination of evidence-based programs for the prevention and reduction of risky substance use among students [28]. To date, lack of expertise, difficulties accessing programs , lack of information or inadequate resources have been identified as factors relevant to implementation [20]. According to results of a systematic review conducted by Suárez-Reyes and colleagues [34], these factors and, as a result, the implementation process vary by context of the different universities. In Germany, large differences exist in the organizational structures of universities [35]. To better handle the described complexity of the implementation and dissemination process, several frameworks have been developed so far which can assist both researchers and practitioners during the process [29, 30, 36-39]. All of these frameworks mention the need for sufficient organizational capacity. One of these conceptual frameworks is the community readiness (CR) model focussing on contextual factors and community readiness and applying a stage based behavior change model to the community level [38, 39]. The Community Readiness Assessment (CRA) [40] was developed as a multidimensional tool based on the CR model [38, 39] to assess capacity of institutions, such as universities, to implement programs. It combines community-based knowledge and cultural contexts about a specific issue to develop capacity-specific strategies to implement programs that promote healthy behavior at the community level. Depending on the stage of CR, different strategies to tailor program implementation are suggested.

The tool was originally developed for the field of substance (ab)use prevention in communities, but since then has been applied to several other public health issues and settings,

including campuses [41-46]. The knowledge about university capacities for implementing online programs in order to prevent risky substance use among students is very limited in Germany [19]. Therefore, it is not surprising that there are no well-tested implementation strategies which support program choice, as well as a sustainable implementation process. The aim of this study was to examine the level of readiness (capacity) of German universities concerning the implementation of evidence-based online programs for risky substance use prevention and to examine to what extent the results of the CRA can be used to develop practical university-specific implementation recommendations (action plans) that assist researchers and practitioners in this setting in implementing such programs.

METHOD

To investigate readiness to implement the three previously evaluated online interventions for the prevention and/or reduction of substance use at ten German universities and to devise tailored recommendations for implementation, a community readiness assessment was conducted at these universities.

The Community Readiness Assessment (CRA)

The CRA is based on the CR model [40]. In the model, five dimensions of CR are defined: (A) knowledge of present prevention programs among university students, (B) problem awareness and support of/by management and key persons, (C) problem awareness and support of/by university students, (D) knowledge of university students about risky substance use and (E) resources for programs at the university. In addition, nine possible readiness stages are defined for each dimension (see Table 1).

The interview guide was developed based on the instructions described in the CRA manual [40]. The questions and the scoring instructions were translated into German and adapted to the German university context. The adaptation took place in several feedback loops in the research team. The guide which was developed contained a total of 42 questions, all score relevant

questions (in total 23) are identical with the ones from the CRA Handbook. Slight changes were made to the additional questions. A total of six additional open-ended questions were added capturing information on specific implementation relevant needs beyond those addressed by the five dimensions of the CRA (e.g., priorities on substances, possible key persons for implementation and hard-to-reach students). Four policy related questions from the original questionnaire were removed because they were not relevant to our study aims. We tested the comprehensibility and feasibility of the interview guide with key stakeholders of the University of Applied Sciences Esslingen (n= 4) which was not part of the study. Only minor additional changes were made after testing.

The participating universities received a feedback on the universities' implementation readiness based on the results of the CRA to facilitate the identification of starting points for choosing and implementing one of the three interventions which had been previously evaluated in the German university context [23-26]. Specifically, an action plan was developed containing recommendations for each stage of readiness for each of the five dimensions (see Table S1).

Recruitment and interview process

To be able to recruit 4-5 stakeholders from the area of health promotion, only universities with already existing organizational structures for health promotion were included in this study. The "Hochschulkompass" (engl.: university compass), an information portal about German universities, was used to identify universities. Subsequently, more information was collected from the individual websites of the universities. To represent the German higher education landscape adequately, at least one university of each federal state was invited to participate and an equal number of research universities and universities of applied sciences were approached. Based on these criteria, 29 universities were invited to participate in the study in December 2016. Of these 29 universities, ten universities in nine federal states agreed to participate. Five

were universities of applied sciences, four were research universities, and one was a teaching training college. At these universities, a minimum of 2,600 students and a maximum of 19,000 students were matriculated during the time of the recruitment. The results of the non-responder analysis suggest that the participating universities did not differ systematically from non-participating universities in terms of number of students or region that they were located in. Willingness to participate in the study appeared to be slightly higher at universities of applied sciences than at research universities (ratio among participating universities: 6/4 vs. non-participating universities: 8/12). The deans' offices were sent a letter of invitation, including a description of the aims and method of the study, and a consent form to participate in the study. In this letter, they were asked to name 4-5 key persons involved in health promotion at their university. These key persons either contacted us or they were contacted by the research team to schedule telephone interviews which were then conducted between January and May 2017. If deans' offices did not react within four weeks, reminder telephone calls were conducted.

Data analysis

The audio-recorded interviews were transcribed with the F4 software and results were analysed, using a coding system and the software MAXQDA 11. The deductive coding system was based on the 42 questions of the five dimensions of the CRA interview guide and the coding was done by two independent researchers. To evaluate the readiness to implement programs preventing risky substance use among university students, an analysis sheet was developed. This analysis sheet contained the coded statements of the interview partners for each of the five dimensions and the requirements that had to be fulfilled for each stage of the dimensions. Results were evaluated separately for each dimension by two independent researchers. The statements of the interviews were sorted into one of the nine readiness stages. Where there was disagreement, researchers had discussions until consensus was reached

regarding diverging classifications. Afterwards, the means of the readiness stages reached across all interviews of one university were calculated. Inter-rater reliability was determined with intraclass correlations which were calculated using SPSS statistical package version 24 resting on a mean rating, absolute agreement, 1-way random-effect model., We found moderate to excellent estimates ranging between $ICC = 0.74$ and $ICC = 0.93$ [47].

Answers to the additional questions in the interview assessing university-specific context were analyzed in a qualitative content analysis according to Mayring [48]. The relevant codes in MAXQDA 11 were exported to an Excel-sheet in which the steps of the qualitative content analysis, namely paraphrasing, generalization and reduction, were performed by two independent researchers. Quotes used in this article to illustrate the main findings were translated from German into English.

RESULTS

Key persons' characteristics

All of the 43 interview partners (4-5 per university) had been employed or had studied at university for at least four years (*range* 4-17 years; *Mdn* = 10 years). Information on the individual positions of interviewees by university is displayed in Table 2.

Community readiness scores at universities

The results regarding community readiness are provided in Table 3 and Figure 1.

The lowest readiness score was 1.0 for dimension A "knowledge about prevention programs", indicating a readiness stage of "no awareness". Students at the respective university J did not know anything about local prevention programs or thought that, at this university, no programs existed. In comparison, at university H, at least some students had heard about local programs to prevent risky substance use (*readiness score 4.5*). In addition, the highest university-specific score was 5.4 observed for dimension E "Resources" which indicates that university G was in

the preparation stage for this dimension. Some students, leaders or key persons were actively working to secure relevant resources for prevention (e.g., soliciting donations, writing grant proposals or seeking volunteers). In comparison, university H reached a level of vague awareness (*readiness score 3.7*), suggesting that there was little or no support for the use of some resources to prevent risky substance use among students. No university displayed consistent readiness stages for all of the five dimensions. For example, university C displayed a combination of "no awareness" for the dimension "Knowledge of prevention programs" and the readiness stage "preplanning" for the "Ressources" dimension (see Table 3).

Figure 1 illustrates the variability in the relatively low scores across all ten universities and for each dimension. The score for the dimension "Knowledge of prevention programs" corresponds to the denial stage meaning that at least some students had any knowledge about implemented programs preventing substance (ab)use among university students. "Leadership" was in the stage of vague awareness. The overall score for the dimension "University climate" was 3.8 suggesting a stage of vague awareness. The score for "Knowledge of the issue" was 3.9 suggesting vague awareness as well. With an average score of 4.4, "Resources" was the highest overall score suggesting a pre-planning stage.

Results regarding additional contextual factors relevant to implementation

While capacity for implementing evidence-based online programs across participating universities was generally low (reported above), additional sets of factors (student characteristics, organizational structure, prioritization of substances for prevention) facilitating or hindering implementation were identified.

Regarding the first set of factors, stakeholders reported student characteristics and course load as factors affecting program participation. For example, interviewees stated that students might avoid existing (non-web-based) prevention programs because they are frightened of getting stigmatized by participating in programs which are not anonymous.

'It certainly has something to do with outing. Everyone thinks that those who go there and also the place where the event is often taking place will immediately lead to outing the participants, that they somehow have a mental problem, that they aren't able to cut the bar in their studies. I think that often the biggest hurdle is simply going there and even being in the room. Often, people who work at the university are the same ones who are leading the program, so there is always a worry that word will get out.'

Another factor mentioned was the lack of time among university students. Interviewees also stated that the location of programs might prevent a large number of students from participating. In addition, stakeholders reported that insufficient awareness of the problem among university students might be a barrier to participation.

'Yeah, I would say that it is certainly internal hurdles. That means unawareness of the problem, or simply too much fear to deal with the problem.'

They also stated that particularly students in urgent need for help meaning those who may have already developed serious substance abuse issues were not currently reached by programs. Moreover, interviewees reported that students who are generally not physically present at the university, for example, those participating in distance learning might not be reached with prevention programs located at the university.

'I think that people with a really big addiction problem, that they really are not even suitable for functional studies, one simply doesn't catch them. You also won't catch those who are right at the beginning, so to speak, those who say "OK, this is all, this is all quite chill, I can stop any time" or with alcohol, those in the area where according to the WHO one might count them as drinkers, but at the same time, they are socially completely inconspicuous and can still perform student jobs. I simply don't think that you will catch those people because their awareness of the problem at that point is too small.'

The second set of factors was related to heterogeneity in organizational structures for supporting substance use prevention at individual universities. At some universities, a few individuals at the health promotion or social work departments were dedicated to program implementation; at other universities, steering groups or even a professional health management were already established. Stakeholders recommended that, in addition to persons in leadership positions, staff working in the administration, in research or education and students should be included in committees and steering groups implementing preventive programs. Additionally, interviewees proposed that the management of prevention programs could be integrated into the operational health management, staff positions for diversity, disabled persons or family, or into psychological student counseling.

'Yeah, we formed a committee, it has been in existence since 1993 (anonymized) and it is the steering group 'Healthy University.' There are different parties from the university represented, for example the Disabilities Officer, the Officer for Work Safety, the Officers for Families, Family-friendliness, Gender, and Diversity, the students' council representative, the management of the university is represented, and Quality Management. Yes, it is a good mixture of different parties, and in this forum we naturally discuss measures. What else is important? We would like to develop further, strategically, and that is what this steering committee 'Healthy University' is all about.'

Thirdly, different substances were prioritized at universities; however, most often alcohol prevention had the highest priority. The second and third often cannabis and tobacco were mentioned. Stakeholders were not sure about the relevance of other substances, such as pharmacological cognitive enhancers.

'With alcohol I know for sure, that it would be good, but with other things I can only assume that it would be good. […] Of course, that is only the most visible, that's why it is number one. When students go around campus noticeably loud and drunk, it is naturally easier to see than when someone somewhere is smoking a joint. As a result, naturally is it a bit biased, I think.'

'Tobacco, alcohol, and maybe cannabis. What I really don't know much about is the consumption of performance-enhancing drugs, I think that that is a really large untouched area.'

Recommended actions according to dimension-specific readiness of universities

Following the CRA Framework which recommends planning readiness specific actions for each dimension, a detailed action plan for implementation was developed. A short exemplary version can be found in Table S1, the long version can be made available upon request. The provided action plan for implementation combines precise actions to implement evidence–based online programs and more general actions to implement prevention programs on-campus.

DISCUSSION

This research is novel in that it is the first to use CR scores to assess multidimensional readiness (capacity) of German universities to implement effective online programs to prevent risky substance use among university students. The adapted CRA was useful for determining different levels of implementation readiness at German universities. Overall, universities included in this study displayed low levels of readiness for implementing online programs for the prevention and/or reduction of risky substance use. Based on the results of the assessment, universities received feedback on how to take necessary next steps to increase readiness and to prepare for program implementation.

Overall readiness was highest for the dimension "Resources" where the stage of pre-planning was reached. This leads to the conclusion that, in general, resources for the prevention of substance (ab)use seem to be available at German universities. However, the overall score of the dimension "Knowledge about prevention programs" was (with 2.1) the lowest indicating a stage of denial or resistance. This, on the one hand, suggests that prevention programs are non-existent or that existing programs are not adequately promoted or visible.

Also, the dimension representing student's awareness of the problem was low with a score of 3.8 representing the stage of vague awareness. This finding is confirmed by results from the German Students Health Survey [9] indicating that only a small proportion of university students see their own substance use as problematic. In addition, our results suggest that awareness of the problem among stakeholders of the university is equally low compared to awareness of students. This leads to the conclusion that addressing students', as well as stakeholders' awareness of the problem at German universities seems to be an important step to increase the dissemination of substance use prevention programs at German universities. The overall readiness scores found in our study are contrary to results of Kelly et al. [44] who found higher scores for the dimensions. This can, in part, be explained by the fact that alcohol prevention on U.S. American college campuses has a long tradition and is comparatively very well established. German universities have only recently begun to put alcohol prevention onto their agenda. Scores for the dimension "Resources", however; were similar in both studies. Moreover, the results of both studies have in common that readiness scores varied between the dimensions, as well as between universities.

In our study, we observed very heterogeneous scores for the individual dimensions and overall scores of the different universities. Not only scores of the dimensions differed between the universities, but also the ranking of the dimensions. For example, university A reached the lowest score for dimension A "knowledge about prevention programs" whereas, in comparison, this was the dimension with the highest score for university B. This underlines the need for very specific tailored implementation strategies for each university and supports findings from the previous literature showing that the implementation process of health promotion programs is dependent on specific contexts [20, 34]. Hence, the various organisational structures of universities [35] which were described by stakeholders during the interviews need to be taken into account when planning the implementation of programs. Existing structures can be used for the implementation process which, in turn, requires a high degree of adaptability of the

programs [30]. Moreover, university-specific factors, such as specific barriers for students to participate in these programs, need to be considered when implementing programs.

Interviewees in our study declared alcohol as the substance with the top priority for prevention efforts at German universities. This finding is supported by results of the study by Orth [8] suggesting that the 30-day prevalence of drinking was highest among university students compared to prevalences for the use of other substances. However, it remains unclear whether alcohol is really the substance with the highest need for prevention or whether alcohol is only the substance which is most visible due to a high acceptance of use in the German society as mentioned by one of the interviewees. Interviewees also gave information on other potential implementation barriers, such as fear of stigmatization, distance learning or lack of organizational resources.

Universities' readiness stages and additional information about local barriers and preferences were combined and tailored support was offered in the form of a written readiness feedback (action plan), an implementation-manual, and an accompanying implementation consultancy with each university. From the practitioner's point of view (results of a process evaluation, not shown here), the CRA was regarded as a useful evaluation instrument and a practical implementation support. This is in line with results of a systematic review and a recent study that concluded the usefulness of the CR model for developing targeted health promotion programs in diverse community settings [41, 49]. Moreover, the tool was inexpensive and easy to access, as has also been previously pointed out by Kelly et al. [44].

There are some study limitations that should be discussed. It is important to mention that the readiness scores, as well as the summarised results of the additional questions, are context-specific. Therefore, these aggregated qualitative findings are limited in their transferability to a broader context. Also, some additional questions in the interview guide were not related to online programs but answers to these questions provided important information regarding organizational structures at universities and initiatives that could serve as a starting

point for the implementation of (online) programs. Moreover, response bias cannot be ruled out because results based on a personal perspective of the key persons interviewed may differ from the actual university readiness level. Because, in this study, data were collected from a relatively small sample of universities, overall community readiness scores may not be representative for all German universities. However, universities which were recruited for this study reflect a structural and geographical spectrum that is likely to represent different types of universities that German students are enrolled in. Furthermore, the presented study captured only a snapshot of participating universities' readiness during the interview period. In addition, the CRA contains a limited number of nine readiness stages. Every university context has to match with one of the defined stages, whereas the „real world" implementation operates on a continuum between „no awareness" and „ownership" [39].

One critical point from the practitioners' perspective was that the written feedback, although it was tailored to the CR of the universities, was still too unspecific. This criticism underlines results from Cronce [20] showing that handbooks and written feedbacks are insufficient when supporting practitioners in the implementation process of prevention programs and that active personal support should be provided as well.

CONCLUSIONS

To conclude, universities participating in this study mostly recognized that they had a role to play in improving university student health. Moreover, universities made some resources available to support substance (ab)use prevention. However, the low awareness of the issue and existing prevention programs and the heterogeneity of readiness for the different dimensions within each university highlight the need to increase problem awareness to further promote the tailored implementation of anonymous online programs requiring little resources. Participating universities were ready to invest in moving forward with their health promotion agenda. Further steps should be aimed at translating implementation plans into action as recommended.

This study demonstrated the usefulness of the CRA for the area of substance use prevention in the German university context. Components of the CRA address both the perspective of the target group (university students), as well as views of professional practitioners (university key persons). Therefore, the assessment is well suited to contribute to the current challenges of integrating evidence-based online programs which have the potential to reach hard-to-reach groups (e.g. off campus students) into existing health promotion activities at universities. However, these online programs programs are suitable for treating serious substance use issues and cannot replace clinical counseling services available on campus. More research is needed to examine the associations between a CRA-based program implementation and changes in substance use behavior and related outcomes. Finally, brief versions of the CRA, have the potential to be used by stakeholders in the field without the assistance of researchers ("real-world laboratories"). A continuous collaboration with stakeholders in this setting will increase our understanding of how implementation and institutionalization of evidence-based programs to prevent risky substance use among university students is best accomplished in this setting.

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Implications

Practice: Low awareness of the prevalence of substance (ab)use among university students and of existing prevention programs targeting this issue in Germany highlight the need to increase problem awareness in this setting and to further promote implementation of web-based programs which require little capacity.

Policy: Strategies for scaling up the implementation of effective prevention programs to prevent substance (ab)use among university students should take into account that universities vary in implementation readiness and contextual factors.

Research: Future research should examine the impact of conducting a community readiness assessment on subsequent implementation and effects of substance use prevention programs.

Figures
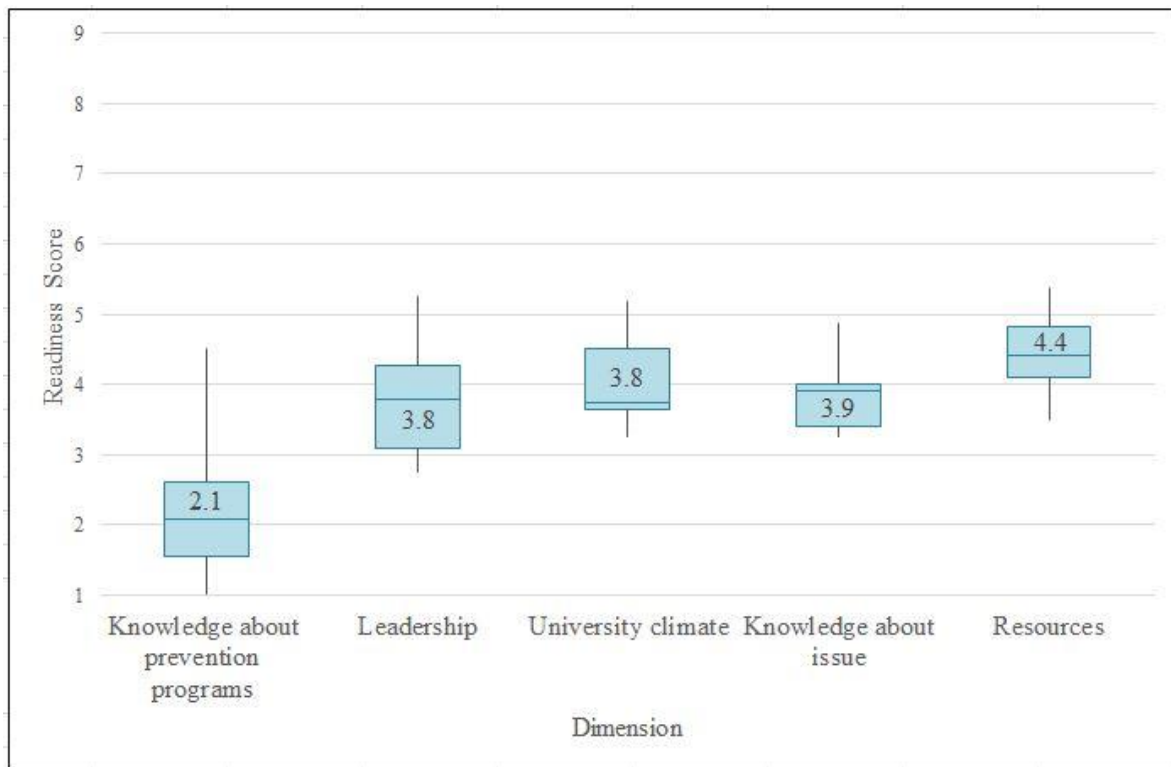
Figure 1. Boxplots of readiness scores across all universities for each dimension (median and minimum plus maximum scores).

Tables

Table 1
Stages and dimensions of community readiness model

Stage of community readiness	Dimension of community readiness
Stage 1: No awareness	A: Knowledge of Efforts
Stage 2: Denial	B: Leadership
Stage 3: Vague awareness	C: Community Climate
Stage 4: Preplanning	D: Knowledge of the issue
Stage 5: Preparation	E: Resources
Stage 6: Initiation	
Stage 7: Stabilization	
Stage 8: Confirmation	
Stage 9: Ownership	

Table 2
Key person characteristics (n = 43)

Profession / Position	Number of key persons

University administration	9 (21%)
Student representation	8 (19%)
Academic teaching	7 (16%)
Psychosocial student counseling	5 (12%)
Health promotion	5 (12%)
Central student advisory service	3 (7%)
University leadership	3 (7%)
Students	1 (2%)
Occupational safety and health protection	1 (2%)
University sports	1 (2%)

Note. All percentages have been rounded off pursuant to the common rules.

University administration   9 (21%)

Student representation   8 (19%)

Academic teaching   7 (16%)

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Table 3
University specific readiness scores for implementing programs to prevent risky substance use among university students per dimension and overall readiness.

Uni-versity		Knowledge about prevention programs	Leadership	University climate	Knowledge of issue	Resources	Overall readiness
A	*M (SD)*	2.2 (1.77)	4.1 (1.79)	4.6 (1.4)	3.9 (1.14)	4.9 (0.25)	3.9 (1.06)
	Stage	Denial	Preplanning	Preplanning	Vague Awareness	Preplanning	Vague Awareness
B	*M (SD)*	4.4 (2.73)	3.0 (0.50)	3.8 (0.00)	4.0 (1.26)	4.4 (0.66)	3.9 (0.58)
	Stage	Preplanning	Vague Awareness	Vague Awareness	Preplanning	Preplanning	Vague Awareness
C	*M (SD)*	1.3 (0.63)	2.8 (0.00)	3.3 (0.43)	3.5 (0.50)	4.4 (0.88)	3.1 (1.13)
	Stage	No awareness	Denial	Vague Awareness	Vague Awareness	Preplanning	Vague Awareness
D	*M (SD)*	1.6 (0.80)	4.9 (2.07)	3.7 (0.57)	3.4 (0.58)	4.7 (1.96)	3.7 (1.35)
	Stage	No awareness	Preplanning	Vague Awareness	Vague Awareness	Preplanning	Vague Awareness
E	*M (SD)*	2.4 (1.55)	2.9 (0.45)	3.3 (1.13)	3.3 (0.47)	4.1 (0.96)	3.2 (0.60)
	Stage	Denial	Denial	Vague Awareness	Vague Awareness	Preplanning	Vague Awareness
F	*M (SD)*	2.7 (2.01)	3.4 (3.07)	3.8 (1.00)	3.4 (0.75)	3.5 (1.41)	3.4 (0.40)
	Stage	Denial	Vague Awareness	Vague Awareness	Vague Awareness	Vague Awareness	Vague Awareness
G	*M (SD)*	1.6 (1.13)	4.1 (0.43)	5.2 (1.21)	3.9 (0.90)	5.4 (1.48)	4.0 (1.52)
	Stage	No awareness	Preplanning	Preparation	Vague Awareness	Preparation	Preplanning
H	*M (SD)*	4.5 (2.46)	5.3 (2.10)	4.2 (1.05)	4.9 (1.59)	4.9 (0.63)	4.8 (0.41)
	Stage	Preplanning	Preparation	Preplanning	Preplanning	Preplanning	Preplanning
I	*M (SD)*	1.9 (2.12)	4.3 (0.82)	4.7 (1.20)	4.1 (0.43)	4.2 (1.04)	3.9 (1.09)
	Stage	No awareness	Preplanning	Preplanning	Preplanning	Preplanning	Vague Awareness
J	*M (SD)*	1.0 (0.00)	3.3 (1.33)	3.6 (1.45)	4.0 (0.29)	3.7 (1.70)	3.1 (1.21)
	Stage	No awareness	Vague Awareness	Vague Awareness	Preplanning	Vague Awareness	Vague Awareness

Note. Values are reported as: Mean Score, standard deviation (*SD*) and readiness stage

Supplement

Table S1 *Short version of a detailed action plan for implementing evidence-based (online) programs.*

CRA-Dimension	Readiness Stage*	Precise actions to implement online programs**	General actions to implement programs**
Knowledge of present prevention programs among university students	Denial (2.1)	**Develop and implement a low-threshold promotion concept** including *Offline actions* (1. Outreach activities on campus. 2. Distribution of flyers, posters. 3. Promotion of the issue in print media via articles or reports) and *Online actions* (e.g., referral to "eCHECKUP TO GO"); whenever possible, involve students in the process of social marketing.	**Raising efforts for establishing a health and prevention culture.** Options include 1. informational workshops and campaign days/ weeks; 2. Raising sensitivity for the topic via environmental prevention 3. house/ dorm rules, sales bans, participatory concepts for safe festive events.
Leadership problem awareness and support by management and key personnel	Vague Awareness (3.8)	**Raise awareness among leaders and key personnel** at your university with respect to the issue of risky consumption of substances and respective prevention options. The following information may be conveyed to leaders and key personnel: Reference to scientific publications regarding prevalence of substance use in the age group of 18 to 29 years or prevalence of substance use among students from German universities. Naming issues – particularly those affecting academic performance - accompanying substance use. Transfer of information by prevention offers, for example, by means of a handbook for the implementation of (online) prevention measures in universities.	**Seek support** and collect arguments for preventive measures at your university. By establishing a **"Steering Committee Health"** you may obtain passive supporters for active involvement.
Problem awareness and support by university students	Vague Awareness (3.8)	**Raise students' awareness regarding the issue of consumption of substances.** The following information may be disseminated among students: **Information** concerning substance use among students and the consequences regarding health and academic performance by interaction/linkage of university specific counseling institutions, if possible. This may be achieved	**Build an inventory of pertinent information at your university**. **If possible, implement health monitoring.** Involve students in this process and attempt to distribute information by offering low-threshold

		with articles in university online and offline media (homepage, newsletter, flyers or posters) **Online prevention programs attempt to raise students' awareness** regarding risky consumption patterns, e.g., by contrasting students' assumptions of the prevalence of substance use with the actual use (social norms approach), and individual risk profiles and feedback regarding consequences of alcohol use. Because students may not support **preventive actions yet, not even passively**, involving students in the implementation process is urgently recommended at this stage.	activities: e.g., gather first-hand experience reports from students and make these experiences accessible to more students. Urge teaching personnel to supervise homework or master's theses. Organize awareness-raising activities for students (scientific speakers for seminars).
Knowledge of university students about risky substance use	Vague Awareness (3.9)	**Inform students about the issue of risky use of substances among students in order to raise awareness**. Encounter false assumptions about substance use by specifically informing students about causes, prevalence, and consequences of risky substance use. General information about substance use may be provided **via online prevention programs as well**.	**Utilize results from existing surveys** about students' risky use of substances and distribute results among students.
Resources for programs at universities	Preplanning (4.4)	**Utilize existing resources for the prevention of risky substance use and acquire further resources.** The following resources potentially available for prevention at your university were named: Students and honorary staff, donations and external funds, experts, rooms, seminars, workshops, conferences. Online prevention measures have the advantage of being relatively cost-effective. In order to implement these measures, funds are required for printing and distributing flyers and posters. In addition, staff taking over the task of actively getting into contact with students, the promotion of the programs via university mailing lists and websites will be necessary.	**Connect existing supporters in order to gain even more internal and external support from the university.**

* Readiness stage across all universities for each dimension, ** shortened example of actions for implementing evidence-based (online) programs.