Engaging Teenagers in Asynchronous Online Groups to Design for Stress Management

Appendix G: Code Book

Research questions:
RQ1: What needs do teenagers envision for support with stress management?
RQ2: How might technologies support needs of teenagers for stress management?
RQ3: What are opportunities and challenges in using asynchronous online groups as a method to engage teenagers in designing for wellbeing?

Coding Library:

	Code	Description of Code
RQ1: What needs do teenagers envision for support with stress management?		
1.	**Stressors and coping**	
1.1	Stressor	Stressor is a stimulus that invokes a stress response. The perception of stimuli is subjective to each teen but there are common stressors of school, family, romantic relationships, self-image, future (college/work).
1.2	Stress perception or appraisal	An individual can perceive stress stimuli to be significant or threatening to them to different degrees or not relevant to them at all. This perception can also be viewed as appraisal of stress (Lazarus et al. [1]) – individual's assessment of how significant the stimuli is to them (primary appraisal) and assessment of their resources for coping (secondary appraisal).
1.3	Stress response	Automatic physiological, physical, and emotional reactions to stressors. These responses can also vary from person to person. As one learns coping, automatic response can be changed with training. For the purpose of coding, we will treat it as the "as is" response without any intervention and not how the person wishes they should respond.
1.4	Coping • Coping_Problem focused • Coping_Emotion focused • Coping_Meaning based	Strategies implemented by individuals to change the stress response [1]. Coping can be: 1. Problem focused coping: focused on changing the stressful situation (information seeking, problem solving, active coping) 2. Emotion focused coping: changing the way one thinks about the situation (venting, avoidance, denial, seeking social support) 3. Meaning based coping: Interpretation of a stressful situation in a personally meaningful way – positive reinterpretation, acceptance, use of religion and spirituality, spirituality Coping may also be situational, depend on a person's personality, self-efficacy beliefs, available resources, and knowledge.
1.5	Coping style	Coping style is an individual's general style of coping. Willingness or openness of a teen to adopt a coping style. E.g., In group 1, most teens preferred distraction and venting. Coping styles are considered to be: 1. Adaptive and maladaptive ways of coping 2. Engaging and disengaging ways of coping:

		This includes problem solving, support-seeking, escape, distraction, cognitive restructuring, positive restructuring, rumination, helplessness, social withdrawal, emotional regulation, information-seeking, negotiation, opposition, and delegation.
		Disengaging: cognitive avoidance, distancing, behavioral avoidance, distraction, denial – when perceived highly threatening and uncontrollable situation – can be maladaptive or intrusive over time [note: based on the data, distraction can also help to return to the stressor with a fresh or different perspective, later. It is counterproductive when the distraction leads to avoidance and a teen never want to come back to the problem]
		Engaging: active coping, planning problem solving, information seeking, making use of social support. (these can include both problem-focused and emotion-focused coping)
1.6	Coping resources	Resources available to teens to access: e.g., social support network (family, peers, mentors), school counselor, professional counselor, technology such as mobile device, tv, financial support, health insurance
1.7	**Perceived control**	Appraisal or judgement of how much control one has to change a stressful situation or their stress response. It can also determine and alter one's coping style over time. E.g.; some teens perceived lack of control over stress and/or stressful stimuli as something that has control over them and not let them function as they otherwise would like to.
		There are positive associations between perceptions of control over illness and psychological adjustment
		Coping in situations that cannot be changed: In situations that cannot be altered, perceived control may increase distress or dysfunction (e.g., severe or fatal illness) – beliefs about control are likely to be adaptive only to the extent that they fit with reality – acceptance is said to be the adaptive coping style in such cases [note: Also relates to hopelessness, helplessness, optimism]
1.8	Barriers to coping	Challenges in emotional regulation, challenges in accessing external resources (social support, stigma, financial support), comorbid health concerns (e.g., anxiety)
1.9	Autonomy/Ownership/Self-reliance	The desire of teens to want to make decisions, take ownership of their health, use self-help measures, and self-management tools. E.g., not wanting to follow parents' decision when planning goals
2.	**Social needs and support**	
2.1	Type of social support • Social_informational • Social_logistical • Social_companionship • Social_emotional • Social_appraisal	The type of support teens expect or receive from others in their network during stressful situations (Langford et al. [2]). **Sub-codes include:** 1. *Informational support:* practical advice or suggestions, provides resources and information, shares their own experience 2. *Logistical support:* Helping me with chores or school work, driving me places, help me with planning or saving time

		3. *Companionship:* holding me accountable, distraction, doing activities together 4. *Emotional support:* listening or venting, positivity/encouragement, validates/acknowledges how I feel, comforting. 5. *Appraisal:* assessment of self or a situation
2.2	Social Ties • Social ties_helpful • Social ties_unhelpful	Social ties include people in the partcipants' offline and online social network -- Friends, best friend, other friends/not close friends, mom, older brother Social ties that are not helpful or make teens feel uncomfortable in asking for support – e.g., dad doesn't understand, mom worries more Social ties that teens do not consider helpful feel comfortable in asking for support – e.g., preferring venting to strangers as opposed to friends or family
2.3	Barriers to social support	Barriers perceived by teens in reaching out for support. E.g., stigma, not having people who listen, unavailability of people in network Include characteristics of unhelpful support from social ties
2.4	Family interdependence	How much do teens depend on family, emotional dependence, how they are affected by parents' stress, codependence
2.5	Family conflict	Teens find family to be a source of conflict or stress. E.g., separation of parents, uninvolved parent
2.6	Family support	Teens find support from their family during stressful situations. E.g., face time home for distraction. Support with prioritizing and logistical support, empathizing, wanting emotional support (being there).
2.7	Family change	Where teens envision scope of improvement in their relationship with family. This includes how they envision design of technology can support change in how they interact with technology.
2.8	Peer influence	When teens want to do activities with peers, influenced by peers, or share with peers. The influence can be positive or negative. For example, peer pressure for maintaining romantic relationships, peer influence on social media
RQ2: How might technologies support needs of teenagers for stress management?		
3.	**Design and Technology:** Includes both existing and envisioned technologies.	
3.1	Technology: positive perception	Positive perceptions or expectations of use of technology for coping with stress 1. Technology_self_positive: e.g., using for self-reflection, tracking, journaling, venting 2. Technology_social_positive: using with others or to access support from others , empathy building
3.2	Technology: negative perception	Negative perceptions or expectations from use of technology 1. Technology_self_negative: e.g., tracking or reminders being intrusive 2. Technology_social_negative: using with others or to access support from others e.g., social media as a source of stress, privacy or overriding autonomy

3.3	Technology: Venting	Technology provides a platform to vent (e.g., text message, digital agent)
3.4	Technology: Increasing exposure	Technology suggests activities or measures for teens to cope and/or take breaks from stressful work or circumstances.
3.5	Technology: Positive restructuring	Technology is a platform for logging positive events (e.g., good things) for memory keeping and may support reflection later.
3.6	Technology: Tracking Mood/Journaling	Technology supports logging mood – both positive and negative. Technology is a platform for journaling thoughts and feelings (free writing).
3.7	Technology: Mindfulness/meditation	Technology supports with guided or unguided meditation, adding personalized music and backgrounds (e.g., Headspace)
3.8	Technology: Logistical support_self	Technology supports with managing time, planning and breaking down tasks, setting reminders, and
3.9	Technology: Facilitating social support	Technology connects with teens with similar stressors. Technology helps share a stress checklist with loved ones who can send check-ins and reminders to do the activities during stressful times.
3.10	Systemic change	Expectations of changes in policy, school curriculums, societal stigma

RQ3: What are opportunities and challenges in using asynchronous online groups as a method to engage teenagers in designing for wellbeing?

4	**ARC Method**	
4.1	Method • Method: anonymity • Method: asynchronous • Method: format • Method: other	Aspects of the ARC procedures and Slack that teens found helpful or unhelpful/would like to change. **Sub codes include:** 1. Anonymity – feedback and preferences on anonymity (e.g., what teens say about using Facebook, privacy) 2. Asynchronourous – feedback and preferences based on asynchronous nature of the study 3. Format: Feedback on format of the study 20 minutes, weekly structure, posting days, compensation) 4. Other: general feedback not in any above category
4.2	Activities • Activities_reflection • Activities_stress/mental health • Activities_other	Aspects of the online group activities that teens found helpful or unhelpful/would like to change (helpful/unhelpful for stress management and mental health, reflection or learning)
4.3	Group interactions	Interactions among group members. **Sub codes include:** 1. Disclosure: comfort, privacy, confidentiality 2. Influence: of other people's posts on their posts 3. Reciprocity: or responses from others 4. Negative experiences 5. Positive experiences

4.4	Comparison w/ Face to Face	Perceived benefit, challenges, and differences if the study format was face to face (speculated).
4.5	Safe space	1. characteristics of people in the safe space, 2. characteristics of conversations in a safe space 3. physical or structural characteristics of safe spaces 4. Examples of safe spaces provided by adolescents 5. Suggestions from teens on creating a safe space (online/offline)
4.6	Researcher strategies/reflexivity	Strategies that researcher needed to adopt and adapt and challenges in running the group (e.g., moderating, maintaining a safe space, dropouts, issues with slack interface)

Note: codes can overlap and are not mutually exclusive. E.g., preferred coping style, social support, and technology_positive can overlap.

Existing app feedback:

	Function appreciated by participants	Apps tried
1	Mindfulness meditation – relaxation, helping relax before sleep	Headspace
2	Tracking mood	Moods
3	Tracking and positive restructuring	Happify
4	Track habits	What's up
5	To do list/planners	WunderList, SplenDo
6	Venting, listening, advice from trained professionals	7cups of tea
7	Distraction or takes mind off from stressor	I love Hue Netflix Spotify
8	Distraction and connect with family	Facetime

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