Web-based Behavioral Health Screen (BHS) for adolescents and young adults

An innovative suicide prevention tool

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Why Screen in Primary Care?

- The three leading causes of death among adolescents – unintentional injury, homicide and suicide – are preventable (Downs & Klein, 1995; Ellen et al., 1998).
- Screening tools can maximize efficient use of time (Rhodes et al., 2001).
- Screening in places like primary care has also been shown to alleviate problems by addressing risk taking behaviors directly (Gadomski et al., 2003).
- Teens are willing to discuss risk-taking behaviors with practitioners (Townsend et al., 1991).
- However, patients are more likely to disclose "socially undesirable" behaviors on a screening tool than they are in a face-to-face interview (Kurth et al., 2004).
- Screening adolescents for risk-taking behaviors or symptoms of emotional distress is a first step in helping practitioners to better address the needs of adolescents (AACAP, 2009; US Preventive Services Task Force, 2009).

Why use a standardized screen?

- Increase case identification
- Identify and refer patients prior to suicidal crisis
- Standardize assessment questions
- Reduce provider bias
- Possible to increase staff efficiency

Barriers to Screening in Primary Care

- Lack of provider training
- Minimal reimbursement, if any
- Difficulty accessing behavioral health services

Limitations of current screening tools:

- Single domain (e.g., depression)
- Lack psychometric validation
- Fail to reduce staff and patient burden

The BHS seeks to address these limitations through a validated, multi-domain, web-based screening design.

BHS Development

- Developed by a team of psychologists, pediatricians, and adolescent medicine physicians
- Comprehensive review of best practice guidelines, existing screening tools, behavioral health and risk behavior measures, and psychiatric diagnostic criteria
- Behavioral health items were designed around DSM-IV criteria
- Items were reviewed by 20 national experts
- Focus groups with pediatricians to tailor for primary care setting

Psychosocial Domains of BHS

- Demographics
- Medical
- School
- Family
- Safety
- Substance Use
- Sexuality
- Nutrition and Eating
- Anxiety
- Depression
- Suicide and Self-Injury
- Psychosis
- Trauma

Suicide Items

- Have you ever felt that life is not worth living?
  - Has this feeling occurred in the past week?
- Have you ever thought about killing yourself?
  - In the past week, including today, have you ever thought about killing yourself?
- Did you ever make a plan to kill yourself?
  - In the past week, including today, did you have a plan to kill yourself?
- Have you ever tried to kill yourself?
  - In the past week, including today, have you tried to kill yourself?
- Have you ever done anything to intentionally harm yourself?
  - In the past week, including today, have you done something to intentionally hurt yourself?

Adapted from: Wintersteen, in press; Wintersteen, Diamond, & Fein, 2007

BHS Procedures

- Patient completes the BHS prior to medical appointment
- Can be completed in waiting room or exam room
- Computer scores answers and generates a report
- Provider reviews report prior to seeing the patient

Feasibility Study

- 24 adolescents were consented and administered the BHS before a medical appointment
- Satisfaction Questionnaire Results
  a) liked the software (75%)
  b) completed the tool on average within 12.4 minutes (sd=5.04)
  c) understood the questions
  d) reported honestly (92%)
  e) thought it should be used in future appointments (92%)
  f) found it helpful during the appointment (94% of those patients whose doctors used the printout during the appointment)

Validation Study

- Sample recruited from primary care clinics
- Completed BHS
- Also completed validation battery that included:
  - Beck Depression Inventory-II (BDI-II)
  - Scale for Suicidal Ideation (SSI)
  - Trauma Symptoms Checklist for Children (TSCC)

Validation Study

Sample

- 415 adolescents aged 12-21 (M = 15.8, SD = 2.2)
- 66.5% female
- 77.5% African American, 10.7% Caucasian, 9.7% mixed race, 2.1% of another race

Scales

- Single-factor confirmatory factor model fit statistics support the unidimensionality of the four scales (depression, suicide, trauma, anxiety)
- All scales had adequate internal consistency reliability (range: .75 - .87)
- Overall accuracy of each scale 78-85%

BHS Reliability and Validity

	Depression	Anxiety	Suicidal risk	PTSD symptoms
Mean (SD)	0.36 (.50)	0.36 (.44)	0.13 (.29)	0.09 (.24)
Internal consistency	0.87	0.75	0.82	0.83
One-factor CFA fit statistics and standardized factor loadings				
CFI	0.99	0.99	0.95	0.99
TFI	0.97	0.98	0.95	0.99
RMSEA	0.08	0.05	0.08	0.04
Factor loadings, range (β)	0.72 – 0.83	0.54 – 0.74	0.64 – 0.74	0.85 – 0.88
IRT item fit statistics and parameters ranges				
Infit	0.81 – 1.29	0.89 – 1.25	0.79 – 1.34	0.79 – 1.25
Outfit	0.74 – 1.34	0.87 – 1.13	0.85 – 1.59	0.70 – 1.45
Item discrimination (a)	0.66 – 1.16	0.86 – 1.14	1.12 – 1.30	0.96 – 1.53
Item difficulty (b)	-0.41 – 1.41	-1.20 – 2.12	-2.25 – 2.01	-0.74 – 0.84
Convergent and divergent validity				
BDI	0.64	0.59	0.48	0.37
SSI	0.44	0.37	0.72	0.31
TSCC – anxiety	0.49	0.65	0.36	0.36
TSCC – PTSD	0.53	0.56	0.43	0.48

Operating curve characteristics of the BHS subscales

	Sensitivity, % (95% CI)	Specificity, % (95% CI)	Overall accuracy, %
Depression	85 (73–93)	76 (71–80)	81
Suicidal risk	83 (71–90)	87 (83–91)	85
Anxiety	88 (68–97)	67 (62–72)	78
PTSD symptoms	80 (56–93)	80 (72–86)	80

Domain	Number of Items	Time Frame(s)	Description	Cut Off
Demographics	3	Current	Race, ethnicity, gender	N/A
Medical	2	Past year	Health over past year	N/A
School	3 and 5*	Current Past year	Grades, attendance, enrollment status, job, activities	N/A
Family	4	Current	Conflict, cohesion, monitoring	N/A
Safety	5 and 1	Current Past year	Personal safety	N/A
Substance Use	4 and 8	Past 30 days Past year Whole life	Use of tobacco, alcohol, other drugs and abuse of drugs	0 - 1= NS 1.0001 - 4 = At risk
Sexuality	3 and 12	Current Whole life	Unprotected sex, number of partners, orientation	N/A
Nutrition and Eating	6	Current	Exercise habits and weight control	0 - 2.045 = NS 2.046 - 4 = At risk
Anxiety	6 and 1	Past 2 weeks Past year	Generalized anxiety, OCD symptoms, panic, social phobia, and impairment	0 - 1.1523 = NS 1.1524 - 4 = Significant
Depression	4 and 8	Past 2 weeks Past year	Feeling sad, loss of interest in things, and impairment	0 – 0.3568 = Minimal 0.3569 – 1.2752 = Mild 1.2753 – 1.6058 = Moderate 1.6058 – 4 = Severe
Suicide and Self-Harm	5 and 5	Past week Whole life	Suicidal thoughts, plan, attempt, self-harm	If life = 0, week = 0, then "No History" If life = 1, week = 0, then "History of Suicide, but not current" If week = 1, then "Currently at risk for Suicide"
Psychosis	2	Past year	Seeing or hearing things that aren't there	N/A
Trauma	8 and 1	Past year Whole life	Exposure to difficult or upsetting things and symptoms of avoidance	0 - 0.94324 = NS 0.94325 – 4 = At risk for PTSD

*Item numbers after "and" refer to number of drop-down items that are only asked if earlier items are endorsed.

Odds ratios for risk factors and BHS subscale scores

	Depression	Anxiety	Suicidal Risk	PTSD Symptoms
Substance Abuse				
Alcohol use (≥ 1 day in past 30 days)	2.57***	2.34***	2.70***	2.26**
Marijuana use (≥ 1 day in past 30 days)	3.02***	3.28****	3.37***	3.81****
Substance use to get high or relax (lifetime)	4.65**	14.94****	6.18**	10.02****
Substance abuse disorder †	3.62**	4.62***	4.62****	6.12****
Been in a car when you or the driver had been using alcohol, marijuana, or other drugs (≥ 1 time in past year)	2.74**	3.46***	3.98****	3.95****
Sexuality				
Been pregnant (females)	2.75***	2.00*	1.45	2.39*
Got someone pregnant (males)	2.60	1.79	4.50*	2.79
Sexual preference (Lesbian, gay, bisexual, or questioning)	3.62****	3.64****	2.92***	2.68**

Odds ratios for risk factors and BHS subscale scores (continued)

	Depression	Anxiety	Suicidal Risk	PTSD Symptoms
Victimization				
Physically or sexually hurt by a romantic partner (in past year)	6.82****	7.65****	7.63****	14.35****
Physically or sexually hurt by an adult who lives in your home (in past year)	15.43****	3.71***	15.25****	6.10****
Eating Disordered Behavior				
Think of yourself as fat despite others saying you're skinny (often)	3.89**	2.22*	1.87*	1.52
Self-Induced vomiting (sometimes or often)	5.32**	3.89*	3.31*	1.54
School Failure				
Dropped out of high school	2.33*	2.47*	1.91	2.73*
Family Disengagement				
Frequent arguing in the home (often)	7.25****	3.77****	2.92***	4.66****

Behavioral Health Screen

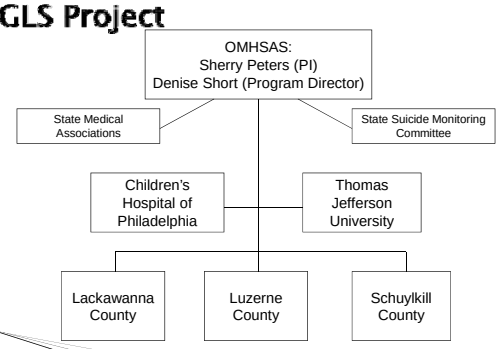
- BHS has promising initial psychometric support
- The web-based platform is innovative and solves common administration problems
- BHS is comprehensive, providing information about psychiatric symptoms and risk behaviors

Demonstration

BHS in broader context – The Pennsylvania GLS project

- BHS is a key component in a multi-layered strategy to help PCPs become better gatekeepers.

Collaborators and Partners in PA GLS Project



Objectives of PA GLS project

1. Create a task force of a broad range of stakeholders.
2. Provide a youth suicide "gatekeeper" training program to participating primary care providers in the designated counties.
3. Provide medical practitioners in three counties free access to a web-based, patient self-report screening tool to assess for suicide and related risk factors.
4. Increase the integration, if not collocation, of behavioral health services with medical services.
5. Provide clinical training in best practice therapy models for suicidal youth to behavioral health providers

Adapting the BHS to practice

- New model emerging
- Two versions of BHS:
  - Short version – (depression & suicide → other domains)
  - Long version – comprehensive (as described)
- Spanish language version
- Expand to adult populations
- This could fit the sick and well visit structure at primary care practices
- Could also allow flexibility in other settings

Questions?

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