

Estimate of Unmet Need among Ohio's High School Students:
A Study Based on 2003 YRBS Dataset
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Introduction

The Youth Risk Behavior Survey was developed in 1990 by the National Centers for Disease Control to determine the extent of certain health risk behaviors in youth. The survey's measurement of health risk behaviors includes tobacco, alcohol and other drug use, dietary and eating habits, physical activity, sexual behaviors, symptoms of depression and suicidal ideation, and other behaviors that contribute to unintended injuries and violence.

Under the auspices of the Ohio Department of Health, the 2003 Youth Risk Behavior Survey was administered to 1,215 students in 35 Ohio public and non-public high schools. The survey gathered a randomized sample so that results from analysis of weighted data could be applied to the entire population of Ohio students in grades nine through 12. Survey results can be applied to an estimated 651,760 Ohio high school students enrolled in grades 9 through 12 in 2003. Survey respondents were 48.8% female and 51.2% male; 83.5% White, 12.9% African American, and 3.6% other minorities such as Hispanic, Asian, American Indian, Pacific Islander or Mixed.

In 2003, the Ohio version of the YRBS included a broad measure of "met need" for behavioral health services that asked students the following question: "When was the last time you saw a doctor, nurse, therapist, social worker, or counselor for a personal problem?" In the simplest terms, "met need" means the adolescent talked with a professional.

The list of professionals (e.g., therapists and counselors) and the placement of the survey question following questions about dental and physical health exams strongly implied providers of behavioral health services. It is important to note that the survey's measure of "met need" does not specifically address psychiatric treatment for a diagnosed illness. However, it can be interpreted as an indicator of youth who, at a minimum, should have been screened by a professional for psychiatric issues in the mix of "personal problems" discussed by the adolescent.

Description of Sample on Met Need

Nearly one-third of the surveyed students (32%) indicated they had talked to a professional in the last 12 months about a personal problem. Table 1 shows the distribution of responses to the survey's "met need" question by gender and race. Roughly the same proportion of Whites and African Americans (32% and 34% respectively) reported seeing a professional, while a somewhat lower proportion (29%) of Other Minorities reported met need. The proportion of African American females (48%)

who reported met need is quite a bit larger than the proportions of White or Other females (35% and 34% respectively). By contrast, only 15% of African American males reported having seen a professional about a personal problem—a much lower proportion than 28% of White males and 24% of Other males. The low proportion of African American males reporting met need is consistent with the literature on the reluctance of this group to seek professional counsel; however, the high proportion of African American females who report having seen a professional was unexpected.

Analyses

Using this measure of “met need” for a minimal level of screening or assessment for behavioral healthcare issues, OPER staff developed two logistic regression models to identify youth with a high enough threshold of behavioral health risk to predict met need for professional contact. To measure behavioral health risk, OPER staff used 18 of the 99 items in the YRBS to develop three indices of behavioral health problems. Selection and inclusion of the 18 items were based on the strength and significance of each item’s association with “met need,” i.e., the strength and significance level at which the item associated with an affirmative response to the question regarding professional counsel for a personal problem.

Four items from the YRBS about depression and suicidal behavior made up the first behavioral risk index (BHrisk1); eight items about substance abuse made up the second behavioral risk index (BHrisk2); and six items concerned with weight loss and problematic eating behavior made up the third behavioral risk index (BHrisk3). The 18 items from the YRBS about depression, suicidality, substance abuse, weight loss and problematic eating behavior also were treated as an additive scale to obtain a single Behavioral Health Risk Index (BHRI) score. Table 2 shows mean scores for the sample on each of the three risk subscales and BHRI, with Chronbach’s alphas for each scale.

With BHrisk1 = 1.37, Other Minorities females had the highest subscale scores for depressive symptoms and suicidality, while African American males had the lowest (BHrisk1=.613). With BHrisk2 = 2.39, African American males had the lowest mean score on the substance abuse subscale, while Other Minorities females had the highest (BHrisk2=5.51). With BHrisk3 = 2.40, Other Minorities females had the highest mean score on the risky eating behavior and weight loss subscale, while Other males had the lowest (BHrisk3 = 1.18). The highest mean score on the combined indices or risk, the BHRI, was 9.29 for Other Minorities females, while African American males scored lowest with 4.29.

Computation of three subscales and the BHRI permitted development of two logistic regression models. The first ordered regression model (Table 3) was developed to determine which of the three subscales most highly predicted the probability of met need among the various demographic groups. The coefficient $\text{Exp}(b)$ for the three risk indices in Table 3 can be interpreted as odds ratios. The larger the $\text{Exp}(b)$, the greater the odds

that a given risk index will predict met need.¹ The combined indices coefficient (column five of Table 3) shows the statistical model has the greatest odds of predicting met need in the African American subpopulation (coef = 3.89), followed by Other Minorities and Whites, 2.34 and 1.98 respectively. In terms of racial groupings, the White subpopulation has the lowest odds ratio (9.8%) on the combined indices. With $p < .001$, this odds ratio is highly statistically significant because there is a less than one chance in 10,000 that this estimation is incorrect.

Table 3 shows that the subscale for risky eating and weight loss behavior had the highest and most significant odds of predicting met need across various populations within the sample. In general, the substance abuse subscale had lower odds ratios, but higher significance levels. In other words, BHRisk2 did not predict met need as high a level of probability as BHRisk3, but estimations of met need associated with this subscale were highly significant, i.e., extremely unlikely to be a case of a random chance.

The second logistic regression model (Table 4) was developed to determine where “most in need” individuals fall within the distribution of met need. In this model, the estimation of “most in need” was calculated by finding the threshold score at which there is a 50% or better probability of met need. Because the BHRI allows determination of threshold scores for various subpopulations, the precise distribution points at which met need becomes a 50% probability can be easily calculated for differing genders and demographic groups. By locating where the “most in need” fall in the distribution of met need, the regression model found in Table 4 allows us to estimate the point at which various subpopulations reach a threshold of met need. In Table 4, the “Proportion of Population” reflects the percentage of students in the sample for whom the BHRI score predicted a 50% or greater probability of talking to a professional about a personal problem in the past 12 months.

Results

Table 4 shows that 53% of Ohio youth who should have seen a professional about a personal problem had an unmet need. However, estimates of unmet need varied significantly by gender and race. Seventy-six percent of males reported an unmet need for professional consultation, compared to 40% of females.

SAMSHA estimates that 5% to 9% of the general population of children 9 to 17 years old has a serious emotional disturbance that impacts two or more life domains, such as family functioning and school success². Table 4 shows that for the general population of Ohio high school students, those with scores in the highest 3% of all BHRI scores had a better than 50% probability of met need for contact with a profession in the previous year.

¹ The odds ratio for a one unit increase in BHRisk1, BHRisk2 or BHRisk3 at 50% probability of met need is calculated by subtracting 1 from the Exp(b) and multiplying the result by 10. In Table 3, students who have high scores in their problem weight loss behavior have a 24.6% greater probability of met need; by comparison, among those with high scores in their drug and alcohol abuse index, there is only a 2.3% greater likelihood of met need.

² Friedman, Katz-Leavy, Manderscheid & Sondheimer, 1997. “Prevalance of Serious Emotional Disturbance in Children & Adolescents.”

Because this statistical model identifies the highest possible range of scores for having met need, those identified within that range can be viewed as “most in need.” We can see that within 3% of the population of Ohio high school students with the highest BHRI scores, 53% reported they did not talk to a professional in the past year about a personal problem. To put the threshold score of 24 into perspective, the mean score for all students on the BHRI is 7.46. (See Table 2.) With regard to the sample, a score of 24 placed the individual more than three standard deviations from the sample mean.

Table 3 shows that the nature of the behavioral health indicator influenced differing estimates of unmet need. The subscales of substance abuse and suicidality were not significant predictors of met need for some groups. The risky eating and weight loss behavior subscale was the most predictive and highly significant indicator of met need for all groups of Ohio high school students.

Gender influences which indicator most strongly predicted unmet need. Looking at Table 3 we also see, with a coef = 3.79, that there is a much higher probability that males with problem weight loss behavior reported having seen a professional than females (coef exp(b) = 2.22³). With a coef = 1.50 at a significance of <.001, females with drug and alcohol abuse issues showed a greater probability of reporting contact with a professional than males. Chances are better than 1 in 1,000 that the 50% or better probability for met need among females with risky substance abuse behavior, while the 11% probability for males is no greater than random chance. Males with risk of depression/suicidality were about as likely as females to have reported met need, but chances are better than 1 in 100 that the 55% or better probability for met need among females is correct while the probability for males is no greater than random chance.

Males who are most in need of counsel for personal problems differ from females on the threshold of their risk indicators. Looking at Table 4 (column 3), we can see that the sample as a whole reached a 50% probability of met need with a BHRI score of 24. We can also see that the adolescents with a BHRI score at the 50% probability threshold represent about 3% of the population.⁴ However, males have much higher BHRI threshold score of 40 and represent less than 1% of the at-risk population. Even within such narrow band of the most-at-risk individuals, 76% of males had an unmet need for professional contact. Adolescent females, on the other hand, had a BHRI threshold score of 16 when they reached a better than 50% probability of met need, and only 40% had an unmet need for professional contact. A greater proportion of at-risk females than at-risk males report met need. At the same time, at-risk males have a higher threshold of risk indication when they report met need

³ Analysis of the survey’s weight and height data using CDC standards for adolescents indicated that 9.57% of the males and 4.75% of the females were obese.

⁴ National estimates of SED prevalence suggest that 5% of the general population of children and adolescents have a behavioral health disorder that significantly impacts functioning in several life domains; about 12% have a disorder that impacts functioning in one life domain; about 20% have a diagnosable behavioral health condition.

Because adolescent males with met need as a group fell within such a narrow band of the population distribution, it was not possible to estimate unmet need among males of the African American and Other Minorities groups across all survey strata. White adolescent males were the only males in the sample who reported met need in sufficient numbers to permit estimation of unmet need.

Ethnicity influences which indicator most strongly predicted unmet need. Looking at Table 3, we see that the depression/suicidality subscale was highly predictive for African Americans, less so for Whites, and not at all predictive for Other minorities. Risky eating and weight loss behaviors were highly predictive and significant for all three ethnic groupings, but more so for African Americans and Other minorities than Whites. The intersection of ethnicity and culture is also evident with regard to the power of the substance abuse subscale to predict met need, with the odds ratio and significance level high for Whites, but low and not significant for African Americans and Other minorities. Although Other minorities had the highest mean scores on the substance abuse subscales (See Table 2), their high level of risk exposure did not associate with the likelihood of having talked to a professional about a “personal problem.” African Americans, on the other hand, had the lowest mean scores on the substance abuse subscale. In such a case, one might also expect a lower probability of met need to be associated with this ethnic group.

Ethnic groups differ on the intensity of their risk indicators when adolescents reach a high probability of met need. As seen in Table 1, African American adolescents had the lowest threshold score (BHRI = 12), less than half that of White adolescents (BHRI = 25) and slightly less than two-thirds that of Other Minorities (BHRI = 32). African Americans had the highest percentage of met need, and not surprisingly, this group of students represents 19% of the at-risk population. The low percentage of unmet need among African American students probably was influenced by unreliable estimates for African American males, a subpopulation too small to allow for accurate statistical calculation across all survey strata. An extremely small number of African American males reported talking with a professional about a personal problem (N=4/33).⁵

Ethnic groups and genders differ on the proportion likely to have reported a met need. Because of their lower BHRI threshold score, a greater proportion of AA girls have the probability of met need than their White or Other Minorities group counterparts. In Table 4, we can see in column 5 that about 32% of AA females had BHRI scores that reached the threshold of likelihood for met need, whereas only 11% of White females and less than 1% of Other Minorities females fell within the most-at-risk proportion of the population.

⁵ The statistical model requires at least 5 “met need” cases to estimate the probability of met need for the subpopulation of African American males. By forcing an additional dummy case into the equation to meet the statistical requirement of five cases, the model estimated unmet need for AA males at 28%

Discussion

An estimate of 53% unmet need is comparable to estimates made by Peter Jensen et al. in an unpublished paper presented on March 30, 2003, in Baltimore, Maryland⁶. Using a dataset of 4,223 12- to 17-year-old adolescents from Iowa, Texas, New York, and the MECA sample, Jensen, et al. developed six symptom profiles that mapped onto DSM diagnoses in 50% to 75% of cases. The Jensen et al. dataset represented about 3% of the population, the same proportion identified as “most in need” by the BHRI in the present study.

The Ohio 2003 YRBS sample contains three subscales of risk behavior that loosely map onto DSM symptom profiles for depression, substance abuse, and eating disorders. However, the present study does not determine need for professional contact by estimating the percentage of cases in the Ohio 2003 YRBS sample that meet DSM diagnostic criteria. Instead, predicted need for professional contact is based on the threshold of risk at which there is a 50% probability the adolescent reported met need. Despite the different methodological approaches, the Jensen et al. study found that “less than half” the children with three symptom profiles were receiving services. In a clarifying statement, Jensen placed the range of unmet need between 50% and 60% for children with two to three symptom profiles⁷.

Individual risk subscales developed for the present study were not as sensitive in predicting met need for males as for females. The lower propensity for adolescent males to talk about personal problems with professionals compared to females has been demonstrated in other studies. The present study supports previous findings on gender differences and demonstrates that adolescent males who report talking to a professional also have a higher threshold of behavioral health risk indicators than their female counterparts. However, the greater likelihood that adolescent males (as opposed to females) with risky eating and weight loss behavior reported having talked to a professional is a significant finding.

It is important to understand that results of this study do not make a direct connection between the nature of the behavioral health risk indicator and the propensity to talk about personal problems with a professional. When the analysis shows that males with problematic weight loss behavior have a strong likelihood of speaking with a professional about a personal problem, this does not mean they necessarily talk about behavior associated with eating disorders. What the findings suggest is that professionals who see adolescent males should screen them for behaviors associated with eating disorders, because there is a high likelihood that the decision to talk about “personal problems” may be associated with risky eating and weight loss behavior. The same can be said for adolescent females with regard to screening for substance abuse.

⁶ Jensen, Offord, Costello, Friedman, Huff, Crowe, Amsel, Bennett, Bird, Conger, Fischer, Hoagwood, Li, Roberts (2003), Unmet Needs for Mental Health Services in U.S. Children and Adolescents: What are the warning signs?

⁷ Email correspondence, 2/6/05.

The higher propensity of African American females to report talking about personal problems with a professional, as well as the lower threshold scores for most-at-risk status may be an accurate representation of reality. ODMH estimations of public mental health service penetration rates for African American adolescents show higher access to care among this group than among other groups of adolescents⁸. In 2004, the mental health treatment rate (per 100,000 populations) for Black adolescent girls aged 12 through 17 was nearly twice that of White adolescent girls. However, this leads us ask why African American adolescents--particularly girls--are more likely than their White or Other Minorities counterparts to talk with professionals about personal problems.

Beyond their apparent propensity for more professional contact, African American girls in the sample had a lower overall risk index than their White and Other Minorities counterparts. Given the confounding of ethnicity and poverty, AA girls may have an important measure of risk that was not captured in the study's three risk indices. But the confounding of ethnicity and poverty does not explain a greater recognition of need for professional counsel. It also is not safe to assume that poor, African American girls will get their needs met in the high proportion found in this study.

Summary

The findings of this study show that adolescents have differing levels of need on three important indices of risk, but in virtually all groups of adolescents, high levels of unmet need exist for screening and assessment.

⁸ ODMH Balanced Score Card #4, January 2005.

Table 1. Distribution of Met Need by Gender & Race

Population	% Who Saw Professional	% Who Did Not See Professional
All Students	32%	68%
Females	37%	63%
Males	26%	74%
Whites	32%	68%
White Fem	35%	65%
White Males	28%	72%
African Am	34%	66%
AA Fem	48%	52%
AA Males	15%	85%
Other ^γ	29%	71%
Other Fem	34%	66%
Other Males	24%	76%

^γOther: Asian, Native American, Hispanic or Latino, Pacific Islander, Multiple Hispanic, Multiple Non-hispanic.

Table 2. Mean Scores on Behavioral Risk Indices

Population	BHrisk1 (Dep & Suicidality) <i>α = .74</i>	BHrisk2 (Drug & Alcohol Abuse) <i>α = .79</i>	BHrisk3 (Weight loss Behavior) <i>α = .74</i>	BHRI (All Three Indices Additive Scale) <i>α = .79</i>
All Students	.789	4.96	1.70	7.46
Females	.917	4.79	2.15	7.87
Males	.661	5.04	1.27	6.78
Whites	.751	5.18	1.72	7.67
White Fem	.858	4.96	2.21	8.03
White Males	.655	5.35	1.28	7.39
African Am	.900	3.20	1.56	5.69
AA Fem	1.10	3.79	1.77	6.68
AA Males	.613	2.39	1.28	4.29
Other	1.07	5.46	1.73	8.27
Other Fem	1.37	5.51	2.40	9.29
Other Males	.819	5.42	1.18	7.39

Highest and lowest subpopulation means are bolded.

**Table 3. Logistic Regression of Met Need on BH Risk Indices,
Using a Broad Measure of Need**

Population	BHrisk1: (Depression & Suicidality) Coef exp(b)	BHrisk2: (Drug & Alcohol Abuse) Coef exp(b)	BHrisk3: (Problem Wgt. Loss Behavior) Coef exp(b)	Combined Indices Coefficient
All Students	1.54*	1.23**	3.46****	1.89****
Males	1.58	1.11	3.79**	1.90**
Females	1.55*	1.50***	2.22**	1.64****
White	1.85 **	1.45***	2.71**	1.98****
AfricanAmerican	5.74**	.88	9.68**	3.89***
Other	1.31	1.14	6.99**	2.34***

Significance levels:

- * <.10
- ** <.05
- *** <.01
- **** <.001

Table 4. Logistic Regression of Met Need on BH Risk Index Score

Population	BH Risk Index $\alpha = .79$ Exp (b)	Threshold Score @ 50% Probability of Met Need	Proportion Of Population for whom Met Need is >50% Probabilityβ	Percent of Unmet Need in this Segment of Population
All Students	1.05***	24	3%	53%
Males	1.03**	40	<1%	76%
Females	1.07****	16	11%	40%
White	1.05**	25	4%	49%
Males	1.03*	44	<1%	70%
Females	1.06****	19	7%	42%
AfricanAmerican	1.13***	12	19%	42%
Males	1.11	*	*	*
Females	1.10**	8	32%	37%
Other	1.04]	32	<1%	64%
Males	.99	*	*	*
Females	1.12**	32	<1%	33%

Significance levels:

] approaching .10

* <.10

** <.05

*** <.01

**** <.001

β Sample percentile reflects the distribution point at which the BH Risk Index score predicted a 50% or greater probability that the student reported talking to a professional about a personal problem in the past 12 months.

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