The Big Ten Student Suicide Study: A 10-Year Study of Suicides on Midwestern University Campuses

Morton M. Silverman, MD, Peter M. Meyer, PhD, Finbarr Sloane, PhD, Madeleine Raffel, MA, and Deborah M. Pratt, BA

The Big Ten Student Suicide Study was undertaken from 1980–1990 to determine the suicide rates on Big Ten University campuses. The study design attempted to address many of the statistical and epidemiological flaws identified in previous studies of campus student suicides. The 10-year study collected demographic and correlational data on 261 suicides of registered students at 12 midwestern campuses. The largest number of suicides for both males and females were in the 20–24-year-old age group (46%), and amongst graduate students (32%). The overall student suicide rate of 7.5/100,000 is one half of the computed national suicide rate (15.0/100,000) for a matched sample by age, gender, and race. Despite the overall lower suicide rate, the analyses revealed that students 25 and over have a significantly higher risk than younger students. Although women have rates roughly half those of men throughout their undergraduate years, graduate women have rates not significantly different from their male counterparts (graduate women 9.1/100,000 and graduate men 11.6/100,000).

Morton M. Silverman is in the Department of Psychiatry at the University of Chicago. Peter M. Meyer is in the Department of Preventive Medicine, Section of Biostatistics, at Rush University. Dr. Meyer was at the University of Chicago during the initial phases of data analysis. Finbarr Sloane is the statistician for Hewitt Associates Employee Research Consulting Group. Dr. Sloane and Madeleine Raffel were research assistants at the University of Chicago at the time of data collection. Deborah M. Pratt is the Administrator at the Student Counseling and Resource Service at the University of Chicago.

Address correspondence to Morton M. Silverman, Director, Student Counseling and Resource Service, The University of Chicago, 5737 S. University Avenue, Chicago, IL 60637-1507. Fax: 312-702-2011.

Preparation of this manuscript was supported in part by a grant to the University of Chicago's Department of Psychiatry from the Anne Pollock Lederer Foundation.

Acknowledgments - This study would not have been possible without the initial support of the Committee on Institutional Cooperation (CIC) of the Big Ten Universities and the University of Chicago. The initial effort to design and field test a survey instrument was undertaken by the Student Counseling Center at the University of Michigan, while the University of Illinois at Urbana-Champaign accepted initial responsibility for the collection and analysis of data. The final data analyses, collation, and preparation of the reports were made possible by a generous grant to the University of Chicago Department of Psychiatry by the Anne Pollock Lederer Foundation.

The senior author is grateful to the Consortium of Directors of the Big Ten Counseling Centers and to the Big Ten Suicide Prevention Research Group for entrusting the data, data analysis, and reporting responsibilities to the core study team at the University of Chicago in 1988. We wish to acknowledge the support, confidence, and assistance of many staff at the Big Ten Counseling Centers during the collection phases of the project. Without the goodwill and patience of the following individuals, this study would never have come to fruition: Indiana University: Nancy Buckles, MSW; Michigan State University: Lee N. June, PhD; Gordon Williams, PhD; Bonita Pope Curry, PhD; Northwestern University: Harry Whiteley, MD; Chuck Pistorio, PhD; Ohio State University: Louise Douce, PhD; Karen Taylor; Susan Glover; Pennsylvania State University; Dennis Heitzmann, PhD; Sue Gibson, RN; Purdue University: James Westman, PhD; University of Chicago: Alan Burrall, LCSW; University of Illinois at Urbana-Champaign: Tom Seals, PhD; Paul Joffe, PhD; Ann Jolly, PhD; Ralph W. Trimble, PhD; Judy Bessai, PhD; University of Iowa: Gerald Stone, PhD; Sam Cochran, PhD; University of Michigan: Evie Gauthier, PhD; Len Scott, PhD; James Whiteside, PhD; University of Minnesota: Rod Loper, PhD; Elizabeth Wales, PhD; University of Wisconsin: Chuck Heikkinen, PhD.

The senior author wishes to thank senior staff at the National Center for Health Statistics, especially Mr. Thomas Dunn, and the Centers for Disease Control and Prevention, especially Drs. James Mercy, Patrick O'Carroll, and Lloyd Potter, for their invaluable assistance in the acquisition of regional and national suicide statistics used in this study.

Editor's note: Dr. Ronald Maris was the Editor at the time this manuscript was reviewed. As is our practice, Dr. Silverman had no part in the review and decision process.

Suicide and Life-Threatening Behavior, Vol. 27(3), Fall 1997
© 1997 The American Association of Suicidology
INTRODUCTION

Prior studies of campus student suicides have been criticized for problems of case finding, case definition, sampling bias, and a paucity of standardized epidemiological and statistical techniques (Silverman, 1993). When calculating suicide rates on campus, the existing studies have not used appropriately matched age, sex, and race comparison groups. Existing studies usually compare campus suicide rates against nationally reported rates for 18–24-year-old White men, thereby arriving at imprecise conclusions (Schwartz & Reifler, 1988). For example, in the fall of 1988, over 13 million students attended more than 3,500 colleges and universities in the United States. Only 57% of these students were 24 years of age or younger, and nearly 30% were age 30 years or older (U.S. Department of Education, 1991). Statistically valid comparative studies of campus student suicides do not exist. This, in turn, leads to inconsistent trend data (Lipschitz, 1990). Previously published student suicide rates have often been sample-specific for individual college populations and not representative of the national college or university student population. Lipschitz (1990), in his extensive review of the world’s literature on college campus suicides, concluded that the literature was inconsistent and could, at best, only suggest a campus suicide rate ranging from 5–50/100,000.

Campus health service personnel have sought to understand the etiology of suicidal behaviors on campus (Arnstein, 1986; Bernard & Bernard, 1982; Brent et al., 1988; Hoberman & Garfinkel, 1988; Mishara, Baker, & Mishara, 1976; Patrick, 1988; Rickgarn, 1994; Schwartz, 1990; Trimble, 1990; Westefeld & Furr, 1987; Whitaker & Slimak, 1990b). The research literature contains many characterizations of the late adolescent/youth adult suicide-prone student (Deykin, 1986; Friedman et al., 1987; Garrison, 1989; Hendin, 1975, 1987, 1991; Motto, 1978; Offer & Spiro, 1987; Rosenberg, Smith, Davidson, & Conn, 1987; Ross, 1969; Sorrel, 1972), and there are now a substantial number of monographs on this subject (Berman & Jobes, 1991; Gans, Blyth, Elster, & Gaveras, 1990; Klerman, 1986; Lipschitz, 1990; Peck, Farberow, & Litman, 1985; Pfeffer, 1989b; Shaffer, Philips, Enzer, Silverman, & Anthony, 1989; Shneidman, 1972; Sudak, Ford, & Rushforth, 1984; Whitaker & Slimak, 1990a). However, there has been very little statistically valid epidemiological data on campus student suicides. This study attempts to rectify some of the major epidemiological and statistical problems inherent in these prior studies.

BACKGROUND

In November 1986, the Centers for Disease Control (CDC) of the Public Health Service (PHS) issued a report on suicide in young adults from 1970 to 1980 (Centers for Disease Control, 1986), which highlighted the fact that suicide rates amongst adolescents and young adults had increased dramatically since 1950. Moreover, they represented the fastest rising age group for suicides. The suicide rate for this age group (ages 15–24) increased 40% from 1970 to 1980, while the rate for the remainder of the population remained stable. Young adults (ages 20–24), in comparison to adolescents (ages 15–19), had approximately doubled their rate and number of suicides during this time frame. White male adults (ages 20–24) had the highest suicide risk among all adolescents and young adults (ages 15–24). Of further concern was that the use of firearms as a method of suicide had increased significantly for both sexes.

Even before the scholarly reports of Berman and Jobes (1991), Lipschitz (1990), Pfeffer (1989a), Schwartz and Reifler (1988), and Schwartz and Whitaker (1990), reiterated the need for better epidemiological studies, it was apparent that a new wave of surveillance and analysis was critical to assist in the development, implementation, and evaluation of
clinical services and preventive intervention programs addressing suicidal behaviors on American campuses. A review of existing studies of the incidence and prevalence of suicide in young adults found a paucity of valid information on which to mount empirically based prevention efforts (Shaffer & Bacon, 1989).

Such a need was also recognized by the federal government in its convening of the Department of Health and Human Services Secretary's Task Force on Youth Suicide in 1986 (Alcohol, Drug Abuse, and Mental Health Administration, 1989). This national effort attempted to delineate the extent of the problem and offer recommendations on the development and implementation of clinical and preventive programs at the federal, state, community, school, and individual levels.

Despite these efforts, college students (predominantly 17–23 years old) and graduate students (mainly 24–34 years old) remained a neglected population in terms of accurate epidemiological health surveys (Patrick, Grace, & Lovato, 1992). Suicide prevention programming that addresses specific risk factors are lacking for these two groups, in part because they straddle the conventional reporting categories (15–19, 20–24, 25–29, etc.) traditionally used to identify behavioral health risk factors. Even the studies of Schwartz and Reifler (1980, 1988) were unable to answer many of the epidemiological questions associated with this population (Silverman, 1993), leaving unaddressed the identification of modifiable risk factors.

Representatives from the major midwestern universities affiliated through the Big Ten Athletic Association first met in August 1985 to endorse a collaborative research project proposal emanating from the University of Michigan. The Committee on Institutional Cooperation, a group of student affairs administrators from the Big Ten universities and the University of Chicago, encouraged this type of collaborative work by funding three annual meetings of the newly formed Big Ten Suicide Prevention Research Group.

Of particular interest was determining the incidence of student suicides on these university campuses, the extent to which students had contacted counseling centers in close proximity to their deaths (Murphy, 1975a, 1975b; Robins, Murphy, Wilkinson, Gassner, & Kayes, 1959), and whether there were risk factor distinctions between and among undergraduate populations and graduate student populations. The identification of modifiable risk factors would encourage the development and implementation of preventive intervention programs directed at those students most "at risk."

This report will focus on the incidence rates of student suicides by age, gender, and race.

**METHOD**

**Study Design**

The Big Ten Suicide Prevention Research Group first conducted a retrospective data-analytic study of all known completed suicides on their campuses from September 1, 1980 through August 30, 1985. It was felt that it would be difficult and unreliable to attempt to identify and validate information on student suicides that occurred beyond a 5-year time frame. Inasmuch as the already published CDC data on youth suicides was quite comprehensive beginning in 1980, it was felt that 5 years of student suicide data (1980–1985) could be gathered, collated, analyzed quickly, and then compared to the existing national data. The Counseling Centers had easy access to university health service records, believed to be the most important source of data on campus student suicides (Carpenter, 1959; Parnell & Skottowe, 1957; Rook, 1959; Schwartz, 1980). After the initial 5 years of data were analyzed (Bessai, 1986), it was decided to continue the study for an additional 5 years.

**Time Frame**

The period of the study was from September 1, 1980 through August 31, 1990. The
study was divided into two 5-year time frames, whereby the first wave of data was collected retrospectively (September 1, 1980 to August 31, 1985) in the Fall semester of 1985. The second wave was a 5-year prospective study from September 1, 1985 to August 31, 1990. All data from the first 8 years of the study was revalidated and updated in 1988. One university entered the study in 1989 (after recently affiliating with the Big Ten University Athletic Association), occasioning the data collection from that school to be retrospective for the period September 1, 1980 to March 31, 1989.

**Exposure to Risk**

The period of exposure to risk was defined in terms of student years. This procedure is accomplished by adding up the number of students registered for each academic year (September 1–August 31), defined by the Fall semester enrollment figures provided by each school. A critical statistical decision was to base our analyses on a 12-month academic year versus a 9-month year (excluding the summer), as has been suggested by some researchers (Cresswell, 1972; Platt, 1986; Seiden, 1966). The decision was based on the fact that almost all of the world's literature on student suicides assume a 12-month calendar, and all of the national data sources used for comparisons are based on a 12-month year.

When we analyzed our data by quarter, we determined that approximately 20% of all our student deaths occurred over the summer months (expected percentage is slightly less than 25%, based on national data). In the mid-1980s, national data indicated a slight increase in the number of suicides during the spring and a slight decrease during the winter months.

Inasmuch as the “academic” year (September 1–August 31) does not coincide with the traditional “calendar” year (January 1–December 31) used to report national suicide statistics, we carefully explored this potential problem in comparing computed rates by age, gender, and race. As the changes in the national annual suicide rates for the age groups of interest were small with respect to the differences between rates in the population and rates for Big Ten students, the fact that we compared academic year rates to calendar year rates does not affect our conclusions. We calculated suicide rates on campus separately by age (each year of age in the study population), by class year of enrollment, by undergraduate versus graduate registration, as well as by gender and race.

**Definition of Student Status**

The term “student” was defined as any individual who was registered in either the graduate or undergraduate programs during the regular academic year (full or part-time). Only the main campuses were included in the study, although many of the larger state schools maintained fairly large-sized branch campuses. As the majority of the participating schools had very few part-time students on their main campuses, it was not felt that the few part-time students who might appear in the group of student suicides would skew the findings in any significant way. It was also felt to be too difficult to ascertain exactly whether a student suicide had a less-than-full-time registration.

A “student suicide” was defined as any death that occurred within 6 months of having been last registered as an active student (“6-month rule”). The 6-month time frame was so designated in order to cover the summer vacation months, the possibility of a student having recently been placed on a medical or academic leave of absence, and students taking coursework or doing fieldwork elsewhere. It was felt that most students would identify themselves as being a “student” if an injury occurred within a 6-month time frame of their last date of active student registration.

There were no reported student suicides who were taking courses elsewhere or who were involved in university-affiliated fieldwork. Therefore, all deaths reported here occurred either on campus, contigu-
ous to campus, or off-campus (most often at home), and all within a 6-month time period of last active registration.

Student Age and Academic Parameters

We set 16–50 years old as the age range for searching for student suicides in medical examiner’s records of death. We analyzed all student suicides reported to us from all sources. The observed age range was 17–49.

It was possible to code an undergraduate student at the time of his or her death by academic class year (freshman, sophomore, junior, or senior), but in several cases it was difficult to determine level of study of a graduate student at time of death. Therefore, the number of academic class distinctions are six: 4 undergraduate years, graduate level, and unclassified advanced standing (“other”).

Definition of Suicide

The term “suicide” was defined as a self-inflicted injury resulting in death. The initial identification of a student suicide was made through the Student Counseling Service staff at each of the respective universities, and then corroborated by other officials, or by a local medical examiner’s certificate of death stating that suicide was the legal cause of death. When a death occurred while a student was at home and we were unable to obtain confirmation from a local medical examiner’s certificate of death stating that suicide was the legal cause of death, we ascertained that the death was, in fact, by suicide from more than one reliable source (i.e., family, registrar’s office, Dean of Students’ office, etc.). Where the cause of death was considered to be accidental, natural, unknown, or equivocal, it was regarded as a “nonsuicidal death,” and not included in the study.

Exclusions

Initially there were 263 student suicide deaths in the registry that met the time frame criteria. Due to rigorous case definition of student status, one student suicide was excluded from the final data analysis because of status: The individual was a part-time extension student enrolled in night classes. In addition, there was one student death (due to an antidepressant overdose) that was ruled by the medical examiner’s office to be an unintentional (i.e., accidental) death, and therefore was excluded from our analysis of intentional (i.e., suicidal) student deaths. The final data set consisted of 261 suicides.

Survey Instrument

The initial survey instrument used for the first wave of the study (September 1, 1980 to August 31, 1985) was a 19-item checklist that included the following information: age, sex, race, country of origin, marital status, academic class year, major area of study, date of death, time of death, location of death, method used, concurrent use of alcohol, residential location at time of death, contact with a member of the mental health service system within the last 2 years, history of prior suicidal threat, attempt, or gestures, and use of psychotropic medications. The information on toxicological analysis was sparse and not statistically evaluable.

Following the collection and analysis of the initial wave of data, the instrument was modified to collect data on student suicides from September 1, 1986 to August 31, 1990. The additional items included notation of day of week of the death, use of other drugs in addition to alcohol, information about the number of counseling or therapy sessions received within the last 2 years, a psychiatric diagnosis (if available), and an expanded listing of the suicidal methods used. The modified instrument sought more information about comorbidity issues and attempted to refine the classification of the suicide method. Thus, the 19-item instrument was used for 6 years, and the modified instrument for the last 4 years of the study. The sample sizes in each separate reporting category shift slightly due to
missing data among the variables collected.

Case Finding
Following receipt of the completed survey instrument, additional investigations were undertaken by members of the core study team at the University of Chicago, which included personal visits to 6 of the 12 campuses to confirm the data with the registrar’s office and other campus administrative units. The core study team also compared death records from the local medical examiner’s office with those of the university’s registrar to ascertain student status, and to identify additional deaths not known to the campus administration.

Hence, case finding was initiated by the respective Student Counseling Services, but confirmation occurred through six separate on-site investigations by members of the core study team. At those schools not visited, Student Counseling Service records of student suicides were verified by the local Student Counseling Service staff with the local medical examiner’s offices.

Confidentiality
This study was submitted for Human Subjects Review and was approved for purposes of case finding, data collection, analysis, and reporting. In addition, each of the participating counseling centers submitted the study protocol in advance to their respective university administrations for their approval and support. Each school received endorsements from the Offices of the Dean of Students, Dean of the Divisions, and Legal Affairs. The study received full support from the Committee on Institutional Cooperation of the Big Ten Universities. Due to the sensitive nature of the study, a decision was made to code all data such that only the core study team had access to all the schools’ individual data and no school had access to another school’s data. Each student death was coded by number, and no student names appear on any files. Furthermore, all the data is pooled and carefully disguised so that it is not possible to ascertain the specific number of suicides or the specific suicide rate at any one of the participating universities.

Participating Universities
All ten midwestern universities comprising the Big Ten Universities Athletic Association, as well as the University of Chicago, participated in the study from its inception. These eleven schools are in the Midwest (East North Central or West North Central) portion of the United States. Three of the universities are in Illinois, two in Indiana, two in Michigan, and the remainder in states contiguous to each other. Pennsylvania State University (Penn State) joined the data collection process at the point in which it was to become a member of the Big Ten Athletic Association. Ten of the 12 participating universities are mainly publicly supported (state supported), and two are privately funded institutions. From 1980–1990, five schools were on a quarter system (four equal academic sessions per year of approximately 11 weeks each), and seven schools were on a semester system (two equal sessions of approximately 15–16 weeks each, with one summer session of approximately 10–12 weeks). One school subsequently switched from a quarter system to a semester system in 1992.

Because of the relative homogeneity of the undergraduate student populations at these universities, in part serving as the basis for their athletic affiliation, it was felt that the study findings would be comparable across sites. Each of the participating universities have comparably designed, administered, and executed Student Counseling Services. Each university’s Student Counseling Service maintains a similar relationship with the other student support organizations and personnel on their respective campuses, allowing for similar access to available information about student deaths.
Data Sources

U.S. population figures for the years 1980–1990 are from the Current Population Reports of the U.S. Bureau of the Census (1993). The estimated figures for the intercensal years (1981–1989) in this report are based upon the 1990 census and as such supersede those of earlier published reports. National suicide data was abstracted from the National Center for Health Statistics (NCHS: 1980–1990) Mortality Detail Tapes for the years 1980 through 1990. Suicides were identified by codes E950–E959 from the International Classification of Diseases (Health Care Financing Administration, 1991). Only resident American citizens were included in the totals.

Big Ten student enrollment figures are from two data sources. The National Center for Education Statistics (NCES) Fall Enrollments (Higher Education General Information Survey) for the Big Ten plus Penn State were obtained in electronic format through the National Data Service for Higher Education (NDSHE) for the years 1980 through 1985. NCES Fall Enrollments (Integrated Postsecondary Education Data System) for the years 1986 through 1989 were also obtained through the NDSHE. NDSHE data include enrollment totals by academic school year, school, class, and gender. In addition, all individual schools were asked to provide enrollment information by class, gender, race, and year of age for each academic year. Table 1 summarizes the data on the enrolled students on these campuses for the 10-year period 1980–1990. Because of the small number of suicides for racial groups other than White and Black, remaining student suicides were pooled into the national reporting category of “Other.”

Statistical Methods

NCES Fall Enrollments together with the enrollment information from the University of Chicago were used in order to provide a consistent source for enrollment totals across schools. There were some discrepancies between the self-reported data and the NCES data.

Race and year of age data were obtained from the information provided directly by the schools. We determined the proportions of each school/class/gender/race group by year-of-age (year-of-age distribution). Year-of-age distributions were graphically compared across schools and across years.

Year-of-age distributions were then applied to the NCES Fall Enrollment data to impute the number of students in each school/class/gender/race/year-of-age group on the basis of the NCES totals (single imputation). If a school did not provide detailed information for a specific year, a surrogate was chosen. Surrogates were chosen to be the closest year for which data was available for that school. Two schools did not provide race and year-of-age data. A comparison of age distributions across schools who provided year-of-age information indicated a high degree of homogeneity. Thus, we felt that surrogates could be chosen even for schools that provided no data on year-of-age. In one case, the surrogate was chosen to be a school in the same state, and in the second case, a similar school in a neighboring state was used as a surrogate. The year-of-age distributions of the surrogate were applied to the NCES totals for each school and year of interest. In the few cases where race or year-of-age information was missing from a case record, those records were excluded from the analysis.

There were only 13,758 unclassified student-years reported by NCES at 8 of the 12 schools during the years 1980–1990. Unclassified students thus make up less than 0.5% of the 3,459,633 student years. Only one school provided detailed information on unclassified students. The race and year-of-age distributions for that school were used as surrogate for the other schools.

U.S. suicide rates were calculated by dividing person-years into the number of suicides for the specific group. Big Ten suicide rates were calculated by dividing
TABLE 1
Demographic Profile of Students At Risk:
1980-1990, Big Ten Student Suicide Study

<table>
<thead>
<tr>
<th>Age Range</th>
<th>Female No.</th>
<th>Female %</th>
<th>Male No.</th>
<th>Male %</th>
<th>Total No.</th>
<th>Total %</th>
</tr>
</thead>
<tbody>
<tr>
<td>15-16</td>
<td>167</td>
<td>0</td>
<td>147</td>
<td>0</td>
<td>314</td>
<td>0</td>
</tr>
<tr>
<td>17-19</td>
<td>486324</td>
<td>31</td>
<td>475673</td>
<td>25</td>
<td>961997</td>
<td>28</td>
</tr>
<tr>
<td>20-24</td>
<td>749079</td>
<td>48</td>
<td>964870</td>
<td>50</td>
<td>1713949</td>
<td>50</td>
</tr>
<tr>
<td>25-29</td>
<td>150695</td>
<td>10</td>
<td>275681</td>
<td>14</td>
<td>426376</td>
<td>12</td>
</tr>
<tr>
<td>30-34</td>
<td>72998</td>
<td>5</td>
<td>120753</td>
<td>6</td>
<td>193751</td>
<td>6</td>
</tr>
<tr>
<td>35-39</td>
<td>44427</td>
<td>3</td>
<td>49853</td>
<td>3</td>
<td>94792</td>
<td>3</td>
</tr>
<tr>
<td>40-44</td>
<td>23981</td>
<td>2</td>
<td>17695</td>
<td>1</td>
<td>41677</td>
<td>1</td>
</tr>
<tr>
<td>45-49</td>
<td>10808</td>
<td>1</td>
<td>6165</td>
<td>0</td>
<td>16973</td>
<td>0</td>
</tr>
<tr>
<td>&gt;49</td>
<td>6863</td>
<td>0</td>
<td>3455</td>
<td>0</td>
<td>10317</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>1545342</td>
<td>44.7</td>
<td>1914291</td>
<td>55.3</td>
<td>3459633</td>
<td>100</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Race</th>
<th>Female No.</th>
<th>Female %</th>
<th>Male No.</th>
<th>Male %</th>
<th>Total No.</th>
<th>Total %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Black</td>
<td>183568</td>
<td>12</td>
<td>309840</td>
<td>16</td>
<td>493408</td>
<td>14</td>
</tr>
<tr>
<td>Other</td>
<td>71049</td>
<td>5</td>
<td>56724</td>
<td>3</td>
<td>127772</td>
<td>4</td>
</tr>
<tr>
<td>White</td>
<td>1290725</td>
<td>84</td>
<td>1547727</td>
<td>81</td>
<td>2838452</td>
<td>82</td>
</tr>
<tr>
<td>Total</td>
<td>1545342</td>
<td>44.7</td>
<td>1914291</td>
<td>55.3</td>
<td>3459633</td>
<td>100</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Class Year</th>
<th>Female No.</th>
<th>Female %</th>
<th>Male No.</th>
<th>Male %</th>
<th>Total No.</th>
<th>Total %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Freshman</td>
<td>351808</td>
<td>23</td>
<td>375128</td>
<td>20</td>
<td>726936</td>
<td>21</td>
</tr>
<tr>
<td>Sophomore</td>
<td>306432</td>
<td>20</td>
<td>340637</td>
<td>18</td>
<td>647069</td>
<td>19</td>
</tr>
<tr>
<td>Junior</td>
<td>298228</td>
<td>19</td>
<td>347590</td>
<td>18</td>
<td>645818</td>
<td>19</td>
</tr>
<tr>
<td>Senior</td>
<td>287141</td>
<td>19</td>
<td>349812</td>
<td>18</td>
<td>636953</td>
<td>18</td>
</tr>
<tr>
<td>Other</td>
<td>5894</td>
<td>0</td>
<td>7871</td>
<td>0</td>
<td>13765</td>
<td>0</td>
</tr>
<tr>
<td>Graduate</td>
<td>295839</td>
<td>19</td>
<td>493253</td>
<td>26</td>
<td>789092</td>
<td>23</td>
</tr>
<tr>
<td>Total</td>
<td>1545342</td>
<td>44.7</td>
<td>1914291</td>
<td>55.3</td>
<td>3459633</td>
<td>100</td>
</tr>
</tbody>
</table>

student-years into the number of suicides for the specific group. Previous studies have looked at suicide rates by 5-year (i.e., 15-19, 20-24, etc.) and 10-year (i.e., 15-24) age groupings. For purposes of this report, we will provide suicide rates for 5-year age groupings by gender, ages 17-49 (except in the case of only reporting 17-19-year-olds as a group).

RESULTS

Number of Suicides
The total number of students at risk per academic year across the 12 campuses was about 346,000 students, or approximately 3.5 million student at-risk years for the decade of the study (see Table 1). The total number of suicides that met case definition and that had sufficient demographic information for inclusion in the study was 261 (Table 2).

As a result of independently comparing medical examiner death certificates with university registrar records for the entire study period, a significant number of additional cases of student suicide were discovered, both from the first 5 years of the study (retrospective) and from the second 5-year wave. Every effort was made to verify all demographic and correlational variables for each of the student deaths. Nevertheless, the analyses reported here contain the following missing information: age at time of death (4), marital status (2), race (7), and class year (3).

The total number of suicides for the 10-
<table>
<thead>
<tr>
<th>Age</th>
<th>Females</th>
<th>Percentage female suicides</th>
<th>Suicide rate</th>
<th>95% Confidence interval (CI)</th>
<th>Males</th>
<th>Percentage male suicides</th>
<th>Suicide rate</th>
<th>95% Confidence interval (CI)</th>
<th>Total n</th>
<th>Percentage of all suicides</th>
<th>Suicide rate</th>
<th>95% Confidence interval (CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>15-16</td>
<td>0</td>
<td>0.0</td>
<td>0.0</td>
<td>(0.0, 1790)</td>
<td>0</td>
<td>0.0</td>
<td>0.0</td>
<td>(0.0, 2040)</td>
<td>0</td>
<td>0.0</td>
<td>0.0</td>
<td>(0.0, 954)</td>
</tr>
<tr>
<td>17-19</td>
<td>6</td>
<td>8.7</td>
<td>1.2</td>
<td>(0.5, 2.4)</td>
<td>27</td>
<td>14.1</td>
<td>5.7</td>
<td>(4.0, 7.8)</td>
<td>33</td>
<td>12.6</td>
<td>3.4</td>
<td>(2.5, 4.6)</td>
</tr>
<tr>
<td>20-24</td>
<td>34</td>
<td>49.3</td>
<td>4.5</td>
<td>(3.3, 8.0)</td>
<td>87</td>
<td>45.3</td>
<td>9.0</td>
<td>(7.5, 10.8)</td>
<td>121</td>
<td>46.4</td>
<td>7.1</td>
<td>(6.0, 8.2)</td>
</tr>
<tr>
<td>25-29</td>
<td>15</td>
<td>21.7</td>
<td>10.0</td>
<td>(6.1, 15.3)</td>
<td>45</td>
<td>23.4</td>
<td>16.3</td>
<td>(12.5, 20.9)</td>
<td>60</td>
<td>23.0</td>
<td>14.1</td>
<td>(11.2, 17.4)</td>
</tr>
<tr>
<td>30-34</td>
<td>7</td>
<td>10.1</td>
<td>9.6</td>
<td>(4.5, 18.0)</td>
<td>12</td>
<td>6.3</td>
<td>9.9</td>
<td>(5.7, 16.1)</td>
<td>19</td>
<td>7.3</td>
<td>9.8</td>
<td>(6.4, 14.4)</td>
</tr>
<tr>
<td>35-39</td>
<td>4</td>
<td>5.8</td>
<td>9.0</td>
<td>(3.1, 20.6)</td>
<td>12</td>
<td>6.3</td>
<td>24.1</td>
<td>(13.9, 39.0)</td>
<td>16</td>
<td>6.1</td>
<td>17.0</td>
<td>(10.7, 25.8)</td>
</tr>
<tr>
<td>40-44</td>
<td>3</td>
<td>4.3</td>
<td>12.5</td>
<td>(3.4, 32.3)</td>
<td>3</td>
<td>1.6</td>
<td>17.0</td>
<td>(4.6, 43.8)</td>
<td>6</td>
<td>2.3</td>
<td>14.4</td>
<td>(6.3, 28.4)</td>
</tr>
<tr>
<td>45-49</td>
<td>0</td>
<td>0.0</td>
<td>0.0</td>
<td>(0.0, 27.7)</td>
<td>2</td>
<td>1.0</td>
<td>32.4</td>
<td>(5.8, 102.0)</td>
<td>2</td>
<td>0.8</td>
<td>11.8</td>
<td>(2.1, 37.1)</td>
</tr>
<tr>
<td>Unknown</td>
<td>0</td>
<td>0.0</td>
<td>0.0</td>
<td>a</td>
<td>4</td>
<td>2.1</td>
<td>a</td>
<td>a</td>
<td>4</td>
<td>1.5</td>
<td>a</td>
<td>a</td>
</tr>
<tr>
<td>30-39</td>
<td>11</td>
<td>15.9</td>
<td>9.4</td>
<td>(5.3, 15.5)</td>
<td>24</td>
<td>12.5</td>
<td>14.1</td>
<td>(9.7, 19.8)</td>
<td>35</td>
<td>13.4</td>
<td>12.2</td>
<td>(9.0, 16.1)</td>
</tr>
<tr>
<td>40-49</td>
<td>3</td>
<td>4.3</td>
<td>8.6</td>
<td>(2.4, 22.3)</td>
<td>5</td>
<td>2.6</td>
<td>21.0</td>
<td>(8.3, 44.1)</td>
<td>8</td>
<td>3.1</td>
<td>13.6</td>
<td>(6.8, 24.6)</td>
</tr>
<tr>
<td>Class Year</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Freshman</td>
<td>6</td>
<td>8.7</td>
<td>1.7</td>
<td>(0.8, 3.4)</td>
<td>22</td>
<td>11.5</td>
<td>5.9</td>
<td>(4.0, 8.4)</td>
<td>28</td>
<td>10.7</td>
<td>3.9</td>
<td>(2.7, 5.3)</td>
</tr>
<tr>
<td>Sophomore</td>
<td>6</td>
<td>8.7</td>
<td>2.0</td>
<td>(0.9, 3.9)</td>
<td>34</td>
<td>17.7</td>
<td>10.0</td>
<td>(7.4, 13.3)</td>
<td>40</td>
<td>15.3</td>
<td>6.2</td>
<td>(4.7, 8.0)</td>
</tr>
<tr>
<td>Junior</td>
<td>16</td>
<td>23.2</td>
<td>5.4</td>
<td>(3.4, 8.1)</td>
<td>34</td>
<td>17.7</td>
<td>9.8</td>
<td>(7.2, 13.0)</td>
<td>50</td>
<td>19.2</td>
<td>7.7</td>
<td>(6.0, 9.8)</td>
</tr>
<tr>
<td>Senior</td>
<td>14</td>
<td>20.3</td>
<td>4.9</td>
<td>(3.0, 7.8)</td>
<td>42</td>
<td>21.9</td>
<td>12.0</td>
<td>(9.1, 15.5)</td>
<td>56</td>
<td>21.5</td>
<td>8.8</td>
<td>(7.0, 11.0)</td>
</tr>
<tr>
<td>Other</td>
<td>0</td>
<td>0.0</td>
<td>0.0</td>
<td>(0.0, 50.8)</td>
<td>3</td>
<td>1.6</td>
<td>38.1</td>
<td>(10.4, 98.5)</td>
<td>3</td>
<td>1.1</td>
<td>21.8</td>
<td>(6.0, 56.3)</td>
</tr>
<tr>
<td>Graduate</td>
<td>27</td>
<td>39.1</td>
<td>9.1</td>
<td>(6.5, 12.6)</td>
<td>57</td>
<td>29.7</td>
<td>11.6</td>
<td>(9.2, 14.4)</td>
<td>84</td>
<td>32.2</td>
<td>10.6</td>
<td>(8.8, 12.8)</td>
</tr>
<tr>
<td>Total</td>
<td>69</td>
<td>26.4</td>
<td>4.5</td>
<td>(3.6, 5.5)</td>
<td>192</td>
<td>73.6</td>
<td>10.0</td>
<td>(8.9, 11.3)</td>
<td>261</td>
<td>100</td>
<td>7.5</td>
<td>(6.8, 8.4)</td>
</tr>
</tbody>
</table>

*Calculating 95% CIs and suicide rates requires information about the ages of these four unknown male suicides. Without the stated age, we are unable to do these calculations.
year period for each school ranged from 6–56. While this represents a large range of total suicides on each campus during the decade, these numbers were related to the size of the student population enrolled at each of these schools. The range of 10-year averaged suicide rates for these schools was 3.1–16.3, with a median of 6.2/100,000.

Because of our interest in the volatility of suicidal activity in undergraduate versus graduate students, the suicides were classified into the undergraduate class years of freshman, sophomore, junior, and senior, other advanced undergraduate, and the general class of graduate students. Inasmuch as most schools classify and report their students by class year rather than age, we believe this analysis to be instructive. We also believe it is valuable to consider suicides in two ways: (1) in terms of the percentage of suicides that fall in a given gender, age, or class and (2) in terms of the rates for a given category. The former is useful on an institutional basis, the latter on an individual basis.

Comparison of Percentages

Percentages depend upon rates and upon the distribution of students among classes, ages, and genders. In our schools, the students were roughly evenly distributed over the four undergraduate classes and graduate study. The majority of suicides for both males and females occurred in the age ranges 20–24 and 25–29 (see Table 2). These age ranges correspond with upper-class undergraduates and graduate students.

The greatest majority (87%) of the suicides in the U.S. citizen student group occurred in the White population (61 females, 166 males). A comparison by racial origin clearly indicates that Black students (male and female) have a significantly lower rate of suicide relative to their representation on campus. The “Other” grouping, which includes Asian Americans, Native Americans, Hispanic Americans, and foreign students, also does not represent as a total group an at-risk “racial” group for suicidal deaths on campus. Although the majority of foreign student deaths (11/16, 68.8%) occurred among graduate students from India and the Pacific Rim countries, suggesting that they may be at increased risk, we need to be aware that the total number of suicides (16) is quite small from an inferential perspective.

There were relatively few suicides among foreign students (2 undergraduate, 14 graduate). The foreign student suicides comprised only 6% of the total number of suicides in the study. Of these, 81% occurred among graduate students and 69% were committed by male students. Our enrollment figures by school were provided by gender, age, and class, not by nationality. Since we were unable to adjust both numerator and denominator for foreign students, we chose to include them in our analyses. For purposes of comparison to U.S. national reporting categories by age and gender, these suicides were classified in the “Other” racial group. A reanalysis of the data excluding these 16 foreign student suicides did not result in a change in the statistical significance of the comparison between student and national suicide rates, nor for student suicide rates by age or gender.

Comparison of Rates

Table 2 contains suicide rates by age and gender, as well as by class year and gender. Table 2 provides calculated Poisson 95% confidence intervals for the rates. Because of the small number of suicides in the 5-year age groupings for students over age 30, we pooled the results into two 10-year age groupings (30–39 and 40–49) primarily for the purpose of arriving at a more precise confidence interval. This provides a more reasonable estimate of the rates for those categories (age × gender) where we observed few suicides, and the numbers of students were small.

Where confidence intervals do not overlap, differences in rates are significant. Thus, suicide rates for women are clearly increasing from ages 17–19 to 20–24 to
25–29. For men, 20–24-year-old rates differ significantly from those of 25–29. A test of equality of rates for men 17–19 and 20–24 years old shows a significant difference ($p = 0.04$). For total rates, we see the same progression.

We performed tests to determine which of the differences among the class years are significant. For women, freshmen and sophomores are different from juniors, but not from each other nor from seniors. However, both freshmen and sophomores differ from graduate students. For men, the only clear differences are between freshmen and graduate students. Rates for men seem to reach a plateau earlier in their college career, while rates for women reach a maximum in graduate school. Rates for men are consistently significantly higher than for women in three of the four undergraduate years (juniors being the exception), with rates for men being approximately double those of women. However, rates for graduate students of both genders are similar ($9.1$ for women and $11.6$ for men), and the differences that were found are not significant.

Table 3 compares the student suicide rates by age grouping and gender to national suicide death rates reported by the National Center for Health Statistics (NCHS) for the period of 1980–1990. Rates were compared using Pearson's continuity corrected chi-square test. The overall suicide rates on the university campuses in this study are lower than the comparably matched cohorts for this study period. There is no reliable way to identify students in the NCHS dataset. Information on occupation began to appear for the first time in 1985, and by 1989, only 21 states were providing this data. It seemed to make more sense to utilize the recognized national rates rather than try to subtract our known suicides from the NCHS data before calculating rates. Trying to impute the number of students in the national census data only makes sense if we can also impute the number of student suicides—which we could not do. Furthermore, if students are included in the control group, then there is a bias in favor of the null hypothesis. That implies that any differences we find are likely to be more significant than we claim.

The average suicide rate across all 12 campuses for the 10-year period was $7.5/100,000$, which is only $50\%$ of the U.S. national rate. Although the overall suicide rates are substantially lower for the students as a group compared to their peers, we have identified some student gender/age groups that appear to be at higher risk than previously known. Of particular note is the suicide rate for students age 25 and over. Their suicide rates were significantly higher than those of younger students. For females, the rates were $3.2$ for those under age 25 and $9.4$ for those over 25, while for males the rates were $7.9$ and $15.6$, respectively. The overall rates were $5.8$ for those under 25 and $10.7$ for those over 25 (all significant at $p < .001$). Compared to national rates, those for younger students tended to be significantly lower than for age-matched national controls, while those over age 25 did not significantly differ from controls.

Differences for younger and older students cannot be explained simply by differences between undergraduate (UG) and graduate (Grad) students. Although rates for females differed significantly (UG, $3.4$ and Grad, $9.1$, $p < .001$), rates for males did not (UG, $9.3$ and Grad, $11.6$, $p = .207$).

**DISCUSSION**

**Advantages**

This ambispective longitudinal, multisite study reports on the largest number of campus student suicides in a single continuous study (10 years inclusive), using standardized data collection instruments, homogeneous campuses, comparable student populations, and monitoring for the critical variables of age, gender, race, country of origin, academic class status, method of suicide, time of suicide, and history of prior contact with campus mental health facilities. This study is the most
TABLE 3
Suicide Rates Compared to the U.S. Population, 1980–1990:
Big Ten Student Suicide Study

<table>
<thead>
<tr>
<th>Age groups</th>
<th>University student suicides</th>
<th>U.S. national rates</th>
<th>Comparison of rates (p-values)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Female</td>
<td>Male</td>
<td>Total</td>
</tr>
<tr>
<td>17–19</td>
<td>1.2</td>
<td>5.7</td>
<td>3.4</td>
</tr>
<tr>
<td>20–24</td>
<td>4.5</td>
<td>9.0</td>
<td>7.1</td>
</tr>
<tr>
<td>25–29</td>
<td>10.0</td>
<td>16.3</td>
<td>14.1</td>
</tr>
<tr>
<td>30–34</td>
<td>9.6</td>
<td>9.9</td>
<td>9.8</td>
</tr>
<tr>
<td>35–39</td>
<td>9.0</td>
<td>24.1</td>
<td>17.0</td>
</tr>
<tr>
<td>40–44</td>
<td>12.5</td>
<td>17.0</td>
<td>14.4</td>
</tr>
<tr>
<td>45–49</td>
<td>0.0</td>
<td>32.4</td>
<td>11.8</td>
</tr>
<tr>
<td>Total</td>
<td>4.5</td>
<td>10.0</td>
<td>7.5</td>
</tr>
</tbody>
</table>

Note. (1) Student suicide rates are the result of dividing numerator by denominator in Tables 1 and 2 and multiplying by 100,000. U.S. rates are from the U.S. mortality files and census figures for the years 1980–1990. This is nonstandard (1980–1989 would have been more natural). However, the student figures are for midyear 1980 through midyear 1990, so the choice is appropriate. Furthermore, rates change little over the decade, so the inclusion of an extra half year at the beginning and end is of little consequence. (2) Student suicide rates include foreign students, whereas U.S. rates include only U.S. nationals. Note also that the number of foreign nationals committing suicide is small (16) in comparison to the number of U.S. students committing suicide (245). *No p-value was calculated since the expected number of events was less than five.

comprehensive attempt to report on the incidence of suicides in undergraduate and graduate school populations by age, gender, and race. By actively pursuing all available data sources, we were able to increase our yield of accurate data dramatically. For example, the initial 5-year wave of data reported 77 student deaths from September 1, 1980 to August 31, 1985 (Bessai, 1986). This data has been referred to in other reviews of college student suicide (Lipschitz, 1990; Schwartz & Whitaker, 1990). After the project was transferred to the current core study team in 1988, we assiduously recontracted the initial sources of data and expanded the network of possible informants to include the medical examiners' offices, campus police, and registrars' offices. We were able to ascertain that there were actually 120 student suicides during the initial 5-year period of data collection (September 1, 1980 to August 31, 1985) instead of the reported 77 student suicides (Bessai, 1986). This is an increase in verified cases of 56%. In a similar manner, we revalidated student suicide deaths from 1985–1988. The final increased yield from the 5-year prospective data collection portion of the study (1985–1990) was 25%. This figure is lower than the 56% for the first 5 years of the study and closer to the estimates of missed cases often suggested by others (Schwartz & Whitaker, 1990). We believe the number of missed cases decreased significantly during the second 5-years of the study because the core study team regularly contacted each school to review case finding procedures, and to suggest better methods to validate student deaths with the local medical officials in their communities.

We were concerned about how representative our findings were for all colleges and universities in the nation given the fact that the 12 universities are located with a contiguous eight-state midwestern geographical area. Overall suicide rates in the 1980s for the midwestern geographical area tended to hover slightly below the national U.S. rates. Statistical analyses suggest that the student populations of these schools are fairly comparable to most other campus populations, and rep-
resentative of the nation's young adults, based on parameters of gender and race. Whether these suicide rates are truly representative of other U.S. campuses is unknown, given the paucity of reported controlled studies using similar parameters and designs.

It is certainly possible for a college administrator to calculate an expected rate of suicide at his or her school by using the rate by age group and gender from Table 3 and applying it to the age/gender distribution at that institution. There are no known campus studies that are comparable to the size, scope, and length of this study. Therefore, we strongly encourage other institutional consortia to undertake similar projects.

Limitations

Certain assumptions for generalizability and averaging had to be made in order to conduct the study: (1) essentially stable student population demographics over the 10 year time frame (ages, gender ratio, size of student body, percentage foreign and minority, undergraduate vs. graduate student ratios); (2) stable entrance and graduation rates over the decade; and (3) that all suicide deaths during summer months and the academic year were recorded over the 10-year time frame. These assumptions were checked against our data whenever possible and found to be supported.

Some suicidologists have raised concerns that the annual national suicide rates traditionally used for matched comparisons may not accurately reflect the actual national suicide rate, in part due to administrative, legal, and political concerns (Dublin, 1963; Fellner, 1961; Kleck, 1988; McIntosh, 1991; Phillips & Ruth, 1993; Sainsbury, 1986). "Among the criticisms that have been leveled against the accuracy of official suicide data are bias and stigma resulting in underreporting and even blatant and intentional misclassification; variability in classification depending on several factors such as the training of the medical examiner or coroner, the use of different definitions, or the lack of a clear, generally accepted definition of suicide" (McIntosh, 1991). This subject has been extensively investigated elsewhere and deserves more space than can be allocated here (Jobes, Berman, & Jesselson, 1987; O'Carroll, 1989; Pescosolido & Mendelsohn, 1986).

Similar levels of underreporting of suicides on college campuses (25–30%) have been suggested (Schwartz, 1990; Schwartz & Reifler, 1980; Westefeld & Pattillo, 1987), even in these smaller community populations. Since we used the same criterion for defining and obtaining our data as that employed to establish national rates, we believe our comparisons between national and Big Ten rates are unbiased and provide an accurate reflection of proportional differences in rates.

How complete and accurate is the reported incidence and prevalence of suicide in the student population at risk? Major effects were undertaken and resources committed to ensuring the rigor of the study design, case definition, case finding, surveillance techniques, and completeness and accuracy of the data. Every effort was made by participating student counseling staff to communicate with the other student service organizations on their campus that might have knowledge of student deaths. These included independent student mental health centers, university hospital psychiatric departments and facilities, campus police and security services, local police departments, and county medical examiner's offices. A suicide by a student on campus is such a disruptive and public event that very few suicides during the regular academic year (approximately September 1–May 31) go unnoticed by students, university administrators, or student personnel staff (Silverman, 1993). It is very unlikely that our collection procedures missed many such deaths.

As reported above, core study team visits to six separate campuses and respective coroners' offices in 1990–1992 to verify suicide information yielded a 25–50% increase in the number of campus suicides.
initially identified by the local school sources for the entire 10-year time frame. An additional school conducted its own retrospective review with the local coroner's office using our methodology. Hence, we feel very confident about the accuracy of accounting for all suicide deaths from 7 of the 12 campuses in the study. The five campuses not visited by the core study team to revalidate all suicidal deaths from 1980-1990 (due to lack of travel funds) reported a total of 72 suicidal deaths for this period. Even if we assume that our rigorous case finding techniques would have yielded an additional 25-50% of true cases on these five campuses (as evidenced on the other campuses that were visited), then our total yield of suicide cases for 1980-1990 would increase by only 18-36. This number of potentially missed student suicides would raise the overall suicide rate for all participating study campuses for 1980-1990 from our calculated 7.5/100,000 to 8.1-8.6/100,000, still far below the calculated U.S. national rate of 15.0/100,000 for this matched population over this same time frame.

We recognize the possibility of some measure of uncertainty in the reported rates. The amount of uncertainty is related to both the number of events observed and the size of the population studied. We calculated 95% Poisson confidence intervals for our rates in Table 2, and Pearson chi-square p-values in Table 3. With as large a sample as we have, we still have very few cases in several categories and that makes detecting differences difficult. There appear to be differences between men and women for some age groups, but even a study as large as this one is not powerful enough to determine a significant difference in those categories.

Suicides that occur out of the local jurisdiction of the university, and ones that occur during the summer months or during vacation periods (when students are more often visiting at home with their families of origin, traveling, or working elsewhere) have a higher likelihood of being missed. Another source of missing cases may be students who were sent home on medical leaves of absence for psychiatric reasons, or sent home for academic difficulties secondary to their psychological problems. Suicides occurring in this group may have been lost to follow-up because they never returned to campus to continue their studies, or because they may have transferred to other universities not participating in this study. After reviewing the information we received from our multiple data sources at each site, we have no indications that we missed students who may have committed suicide within 6 months of leaving active student status at the participating schools.

Each Student Counseling Center is aware of completed suicides among former students who had exceeded the 6-month registration requirement for inclusion in the study because they graduated, or were on extended medical or psychiatric leaves of absence. There were also a number of suicides that occurred among former students who were living on or near the university campuses, but who had long ago severed any formal relationships with the university. These local suicides often became part of the community or campus “lore” about the number of suicides occurring on a particular campus during an academic year. The suicides of students on medical or psychiatric leave of absence also often filter back to campuses, and become part of the student perception that a university may have a “suicide problem.” By definition, these suicides were excluded from this study.

The subject matter of this study involves issues of great emotional and psychological sensitivity to all concerned. Studies of student suicides touch on issues of privacy and confidentiality, matters of an institution's public relations, and the development, implementation, and evaluation of policies and procedures for the provision of student services to those most at-risk and in need of comprehensive services. Hence, it is not easy to conduct such a study over time because of the perceived concern that the results may not be favorable to a particular university's public and private image. Be-
cause of the initial support and cooperation of the participants, we were able to sustain the data collection effort over 10 consecutive years without disruptions.

A deliberate decision was made not to interview parents, spouses, family members, or friends of the deceased. Initially, the goal of the study was purely to determine the incidence and prevalence of campus student suicides among the participating universities, with the hope of thereby refining existing preventive intervention and clinical programs in light of new information emerging from an analysis of the characteristics of those students found to be most at-risk for lethal outcomes.

The study suffers from the fact that it is in part retrospective. Prospective studies always carry a glimmer of being more valid and reliable than retrospective studies, although this may not necessarily hold true here. It does appear, however, that our prospective numbers (1986-1990) are more complete and richer in detail (due to the improved data collection instrument), than the data gathered during the 5 retrospective years covered by the initial study (1980-1985) (Bessai, 1986; Sartwell, 1974).

Obviously, we cannot talk to the subjects of the study to learn of their motivations, intent, and reasons for their lethal behavior. Hence, we can only draw conclusions about what may have contributed to their final behavior based on the available data surrounding the time of their death. Whether we can infer some meaningful information (for purposes of preventing future suicides) from such an analysis of demographics and temporal conditions is yet to be conclusively shown (Murphy, 1983a, 1983b; Pokorny, 1983, 1993). Additional reports from this study will address these risk factors.

CONCLUSIONS

Recent reviews of the existing literature suggest that the rate of completed suicides on college campuses may be as low as 50% of the national average for approximately matched age and gender groups (Schwartz, 1990; Schwartz & Whitaker, 1990). Our data suggests that the overall student suicide rate is indeed 50% of the nationally matched samples for age and gender. However, depending upon student age and gender, these rates can fluctuate from 30% of the national rates for 17-19-year-old male and female students to 169% of the national rate for women ages 25-29.

Why, then, are suicide rates on college campuses, for the most part, less than the comparable national figures matched for age and sex? It is our belief that college campuses provide more readily available student support services, including easy (and low cost) access to health services and mental health services. In addition, college campuses provide a more supportive peer and mentor environment than can be easily and safely found in the general community. One cannot dismiss the importance of peer support, peer companionship and compatibility, and ready availability and accessibility of numerous student support services and personnel on most American campuses. The range of support includes coaches, professors, residential advisors and staff, career and placement experts, university health service professionals, student guidance counselors, educational skills counselors, campus ministries, clinical therapists, nurses, physicians, clinical psychologists, social workers, student activities professionals, deans of students, and other administrators whose careers are devoted to nurturing healthy minds and healthy bodies. Similar personnel and environments are not so readily available to young adults in other settings outside of academia.

We arrived at the “6-month rule” of defining student status as a means to set limits on the determination of whether a reported suicide death of a young adult should be recorded as a “student suicide” or be relegated to a disturbingly large category of “former students” who commit suicide. We chose this interval for reasons...
already discussed. No attempt was made to ascertain the status of dropouts and nonreturnees beyond the 6 months of last registration. However, it raises a theoretical question about the possible "halo effect" associated with being an active participant in the ecology of campus life. Put differently, what might be the "protective benefits" of being exposed on a daily basis to the ambience of a campus environment? How long does the "halo" last? What might be the essential ingredients that comprise the "halo"? Is it an interactive process between able participant and receptive environment? These and other related issues deserve further thought and research.

Some researchers have stated that college campuses also provide opportunities for the development and exacerbation of stress disorders, including suicidal behaviors that are consequences of perceived or real stress (Seiden, 1966). These researchers suggest that it is the academic quarter systems (vs. semester systems) that cause increased stress, in addition to parental pressures to succeed, and economic pressures to successfully complete a course of education and training in shorter periods of time. Others suggest that suicide rates are higher in the Fall and Spring semesters, markers of stressful times for students, particularly with end-of-the-year exams and preparation for graduation (Ross, 1969). Subsequent research will analyze our data to address these points.

A decrease in the overall suicide rate among university students may be due to the general campus prohibitions on the availability and use of firearms, the careful monitoring and control of the abuse of alcohol, the stated prohibition on the possession and use of illicit drugs, the clear message of the purpose of a college and graduate school education (i.e., the advancement of one's own career, the enhancement of skills and knowledge, the opportunities for personal growth and development), and the relative degree of protection from the "daily hassles" of day-to-day life that may occur in nonacademic settings (Lazarus & Folkman, 1984).

One might argue that most undergraduates are, for the most part, under less stress and pressure to provide for their own daily needs. Even if they are being supported by student loans, they often perceive the "day of reckoning" as so far off in the future as not to be existentially important. We would predict, then, that the pressures would begin to increase for juniors and seniors, for they see that the decisions they have made and are making, the grades they receive and the relationships they enter, are going to carry over into what follows their college experience. They are beginning to adopt a "work" mentality.

Depending upon the relative level of financial support awarded to an entering graduate student, this sequence of mounting pressures might not become significant until the later years of graduate study. However, graduate students not only are trying to carry on an adult life (perhaps with children or responsibilities for their parents), they are also trying to learn and carry on a student life. Those who experience a setback in an important relationship or in their student work are more likely to be weighed down by the consequences the setback will have for current and future relationships and work. For the younger student there are always new opportunities, new relationships to be found. This may remain true for the older student, but that is not the way it is often perceived. As a consequence, we would expect a differential in the way younger and older students approach setbacks, face realities, and select ways of responding and coping.

The age range of 17-19 years of age accounts for 31% of the females and 25% of the males on campus, whereas this age range comprises only 9% of the female suicides and 14% of the male suicides, respectively. The age range of 20-24 years account for 48% of the females and 50% of the males on campus, as well as 49% of the female suicides and 45% of the male suicides. However, for the age range of 25-29 years, the respective numbers are 10% of the females and 14% of the males on cam-
pus, corresponding to 22% of the female suicides and 23% of the male suicides. In fact, 39% of all female suicides occur among graduate students, who comprise only 19% of female student overall.

As students age, they may well perceive the college (and university) experience differently and hence respond to the challenges and stresses by utilizing different strategies and coping mechanisms. Even if all the resources that are traditionally available on university campuses remain constant for all students, older students may access them differently, if at all. This suggests that universities might well consider developing new and targeted intervention programs for older students—both at the undergraduate and graduate level.

Our data suggest that there is, in fact, a higher suicide rate (compared to national rates) in those female students who are in their mid- to late-20s and older, compared to those female students who would normally be pursuing undergraduate degrees (ages 18–23). Our data suggest that for females the suicide rate is below the national rates during the first 2 years of college life, about even during the junior and senior years, and above the national rates during the graduate school years. It appears as though there is a continuous transition toward suicidal behavior as female students age. This surely suggests that university counseling services and other student support services should target the graduate student female population as one where the risk for suicide is higher than in the normative undergraduate population, as well as "the older" female student who may be returning to campus to pursue undergraduate or graduate studies later in her life.

The same increased rate is seen for older male students, ages 35–39, and ages 45–49. These students represent a different cohort from their class-year peers across many sociodemographic domains. Focusing suicide prevention efforts to all older students (especially those older than 30 years) seems indicated from our data.

Although studies suggest that suicidal ideation and attempts may be high in the adolescent and young adult populations (Linehan, 1986; Maris, 1992), our results coincide with that of the national statistics indicating that the populations ages 25–29 and older are at higher risk for suicide than their younger college-age colleagues. Attention should be paid to the older returning undergraduate and graduate students who must make major life transitions and accommodations in order to return to university life in pursuit of education and training. For them, returning to school appears to be a major life stressor. The financial and personal investment in their future, coupled with the sacrifices made to reenter this environment, may place them at increased risk for subsequent suicidal behavior.

Future reports emanating from this study will address year-of-age student suicide rate analyses (ages 17–49); the additional role of ethnicity/race as a contributing factor to the suicide rates; cohort studies (including an analysis of date-of-birth cohorts); residential life influences on subsequent suicidal behavior; role of prior therapy and subsequent suicidal behaviors; comorbidity of suicide with alcohol and other drug use; analysis of the methods used to commit suicide as a function of age, gender, race, and country of origin; analysis of first-year matriculants (first-year college and graduate school vs. returning students); the role of social support; the effect of time of day, day of week, and time of year (seasonality); and an analysis of clusters and contagions.

REFERENCES


