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Younger onset of depression is associated with greater suicidal intent

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Abstract *Background* Age of onset of major depression seems to be dropping in Western nations. Early onset usually predicts a more serious illness with a relatively poor prognosis. Since depression is associated with suicide, this begs the question of whether early onset of depression is associated with the degree of intent of suicidal behaviour, and whether this relationship differs according to gender. *Methods* Relevant responses from 9,282 residents of the United States were drawn from a nationally representative community survey conducted in 2001 through 2003 using the W.H.O. version of the Composite International Diagnostic Interview. The primary outcome measure was the retrospectively determined age of first major depressive episode. *Results* Younger age of onset for depression was associated with higher levels of suicidal intent, irrespective of age at the time of interview. A significant interaction between level of intent and age at interview appeared to be accounted for by the later onset among those in the eldest cohort who reported an absence of suicidal behaviour. The influence of suicidal intent on onset of depression was greater for women than for men. *Conclusions* The earlier the age of first symptoms of major depressive episode, the higher the degree of suicidal intent, irrespective of age at interview and gender, although the more pronounced trend for women suggests a greater sensitivity to underlying factors that may involve depression and lead to suicide risk.

Key words depression – suicide – gender – ideation – onset

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Introduction

Early appearance of most psychiatric disorders is generally an indicator of a poor prognosis, and major depression is certainly not an exception. Onset during childhood increases the likelihood of depressive recurrence [21] and predicts social and other problems of life [12, 31]. Furthermore, relatives of persons with early onset of depression have higher morbidity than those with a later onset [4, 47, 48]. It is a source of additional concern that there is strong evidence showing a depression-age gradient with major depression being more common among the younger cohorts [7], and that first signs of depression are appearing at a younger age [23, 32]. Lewinsohn and his colleagues [23] point out that the probability of reporting an episode of major depressive disorder prior to age 34 was ten times greater in a 1945–1954 birth cohort than in a 1905–1914 cohort. Seligman, noting that bipolar disorder (which has been shown to have a larger genetic component) has not shown a similar increase, has concluded that, at least among the World's wealthiest countries, we have an epidemic of depression [38].

Depression has been associated with increased morbidity and mortality for a number of social problems, paramount among them being suicide [25, 41]. In fact Harris and Barraclough [10] noted that suicide represented the main single cause for the increased mortality found among those with depression. This raises the notion that early onset of depressive behaviour might thus be associated with more serious suicidal behaviour.

It has been common clinical knowledge throughout the era of modern psychiatry and mental health treatment that depression and suicide are closely linked [36]. More recently, this observation has been confirmed and expanded by psychological autopsy studies (see the review by Lönnqvist [25]) and large-scale community surveys [5, 16, 33]. In fact, though,

suicide is associated with virtually all psychiatric disorders [16, 41], but Kessler and his colleagues [16] found that the relationship was strongest with depression. Thompson and Bland [41] also observed a strong link between major depression and suicide attempts, but noted that mania and schizophrenia showed the strongest associations (collectively, however, these two disorders did not account for as many cases as did depression due to the latter's higher prevalence).

An important correlate of both suicidal behaviour and depression is gender. It has been well documented that in nearly all cultures attempts are more common among women, while completions are higher among males [46, 49]. The higher prevalence of depression among adult women has proven to be a robust international phenomenon, with female to male ratios ranging from about 1.5 to 3.5 [17, 45, 49]. Of relevance to this are developmental changes associated with gender and depression. Cyranowski and her colleagues [8] have suggested a model that implicates heredity, hormonal differences, and response to stressful life events to explain a number of such gender differences, including the fact that girls do not exceed boys on depression until after puberty [2, 6, 27], pubertal status in girls is related to depression [2, 30], and girls appear to be sensitized by the depressogenic effects of stressful life-events [1].

There is a long-standing controversy about the progression from attempted suicide to completed suicide [13, 22, 37]. Although significant opinion suggests that suicide ideators, attempters, and completers represent three distinct groups, albeit with some overlap [9, 24, 44], many now place presuicidal behaviour on a continuum of increasing seriousness of suicidal intent that often leads to completed suicide [28]. This is based on the observation that suicidal ideation ordinarily precedes a suicide attempt [3]. Staging can move through despair, a death wish, suicidal thoughts, planning, attempts, and finally, suicide [35, 43]. From this view, it is important to examine the factors that may cause or predispose one to continue to move along the path towards suicide or to take a more life-sustaining route. The present study will focus on the age of onset of depression and its association with suicidal thoughts, plans, and attempts. This, to test the notion that earlier onset will be associated with a greater degree of suicidal intent.

Methods

■ Data source

Data were extracted from the public-use files of the National Comorbidity Study Replication [14]. The NCS-R is a nationally representative household survey of residents of the United States aged 18 and older between February 2001 and April 2003. Face-to-face interviews were carried out by professional interviewers from the Institute for Social Research at the University of Michigan, Ann

Arbor, between February 2001 and April 2003. The response rate was 70.9%. More detailed information on this complex community survey has been published by Kessler and his colleagues [15, 18].

■ Survey instrument

The survey instrument comprised two parts. Part I included a core diagnostic assessment of all respondents ($n = 9,282$) that took an average of about 1 hour to administer. Part II included questions about risk factors, consequences, other correlates, and additional disorders. Part II was administered to only 5,692 respondents (those with a lifetime disorder plus a probability subsample of the remainder). Informed consent was gained from all respondents. The NCS-R diagnoses are based on the World Mental Health Survey Initiative Version of the World Health Organization Composite International Diagnostic Interview (WMH-CIDI) [34], a fully structured lay-administered diagnostic interview that generates diagnoses in accord with both the International Classification of Diseases, 10th Revision [20] and the DSM-IV [19].

Note that individuals who did not endorse the statement "You seriously thought about committing suicide" were not presented with any further items about suicidal behaviour. This means that any individual who had made an attempt or a plan, but who disclaimed suicidal thoughts, would not have been included in further analyses as a person exhibiting suicidal behaviour.

The NCS-R includes all of the significant psychiatric diagnoses used in population based research, but for the purposes of this study, the following variables were selected/created (note that the study design was cross-sectional, thus responses to many of the variables were determined retrospectively).

Age

Age at interview for those screening positive for suicidality (i.e. had suicidal thoughts). Age was also categorized into three age groups: (1) Under 30 years, (2) 30–44 years, and (3) 45 years and over. This variable was included because some of the respondents at interview would be below the age of onset of suicidal behaviour reported by many of the older respondents. Thus, an age comparison would allow an evaluation of potential bias caused by this matter. Much suicidal behaviour occurs before age 30 [11], thus the choice of the first split, and the second was chosen simply because age 45 is a common discriminator surrounding middle age and it lay near to the 67th percentile.

Major depression

Two variables; confirmation of a diagnosis of major depression (DSM-IV) and age of first major depressive episode. The first episode designation used in the NCS-R did not necessitate the attainment of the full criteria for a DSM-IV diagnosis, but it did require "several" days running when most of each day was spent feeling sad, discouraged, or uninterested, plus the presence of some of the signature problems of major depression (e.g. sleep problems, weight change, hopelessness, etc.). Respondents who reported being unsure of their age upon the occurrence of their first major depressive episode (and who were administered an estimation procedure) were excluded from the study.

Suicide ideation

Lifetime presence/absence of serious thoughts of suicide, and age at which the first suicidal thought appeared.

Suicide plan

Lifetime presence/absence of a suicide plan, and age when first suicidal plan was created.

Table 1 Summary of the ANOVA of the effects of gender, age at interview, and level of suicidal intent, on the age of first episode of depression

Source	Sum of squares	df	Mean square	Polynomial contrast/SE	F	Significance
Gender	753.0	1	753.0		5.57	<0.02
Age at interview	22,707.2	2	11,353.6		83.9	<0.0001
Linear		1		9.92/0.78		<0.0001
Quadratic		1		1.18/0.72		N.S.
Level of intent	9,565.3	4	2,391.3		17.7	<0.0001
Linear		1		-5.13/0.81		<0.0001
Quadratic		1		-0.14/0.91		N.S.
Cubic		1		-1.61/1.03		N.S.
Fourth order		1		0.44/1.09		N.S.
Gender × age	227.3	2	113.7		0.84	N.S.
Gender × intent	2,166.4	4	541.6		4.0	<0.003
Age × intent	3,548.0	8	443.5		3.28	<0.001
Gender × age × intent	348.1	8	43.5		0.32	N.S.
Error	243,258.5	1,798	135.3			
Total	351,818.8	1,827				

Suicide attempt

Lifetime presence/absence of a suicide attempt (whether or not there was a stated intent to die), and age when first suicide attempt occurred.

Level of suicidal intent

Constructed with five levels. The lowest level included those who reported no suicidal behaviour, with suicidal thoughts (ideation), thoughts plus a plan, and thoughts plus an attempt being ordered in accord with their ordinal position on the hypothetical pathway to completed suicide. The fifth, comprising individuals who exhibited all three, was deemed to be of the highest suicidal level because of the presumably higher risk due to the cumulative presence of all three components of intent.

Statistical analysis

The influence of gender, the level of suicidal intent, and age at interview (categorized) on the age of first depressive episode was analysed with the use of a full-factorial univariate analysis of variance (ANOVA). This allowed a test of the main effects of each of the three independent variables and their interactions. Orthogonal polynomial contrasts were applied to test for linear and non-linear trends across level of intent and age at interview. Subsidiary analyses were conducted using the Chi-square statistic for independent groups.

Results

Of the 9,282 respondents, 15 reported that they were unsure of the age of onset, and were excluded. Of the remaining 9,267, 1,829 (19.7%) met the criteria for major depression and 1,461 (15.8%) had acknowledged some form of suicidal behaviour (thoughts with or without plans and/or attempts). Comorbidity between suicidality and depression was high, with 39.8% of depressed individuals experiencing serious thoughts of suicide at sometime during their lives.

Considering only those individuals exhibiting major depression, a univariate ANOVA (Table 1) showed a statistically significant relationship between

age of onset and each of the three main effects (level of suicidal intent, age at interview, and gender).

Suicidal intent showed a strong linear effect that was not meaningfully tempered by its significant interactions with either gender or the respondents' age at interview. That is, the earlier the appearance of depression, the greater the level of suicidal intent.

The significant main effect for age at interview is best understood in the context of its significant interaction with intent, as illustrated in Fig. 1. Clearly, cohort age is positively correlated with age of onset; the younger the age at interview, the earlier the onset. Furthermore, suicidal intent shows the aforementioned strong linear relationship with onset for each of the three age-cohorts independently. A post hoc analysis indicated that the significant interaction was due to the elevated average age of onset of depression

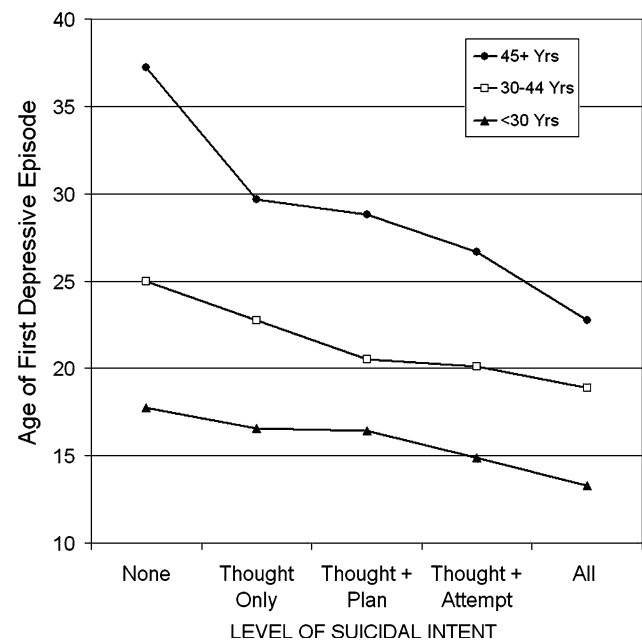


Fig. 1 Age of first depressive episode by age at interview and level of suicidal intent

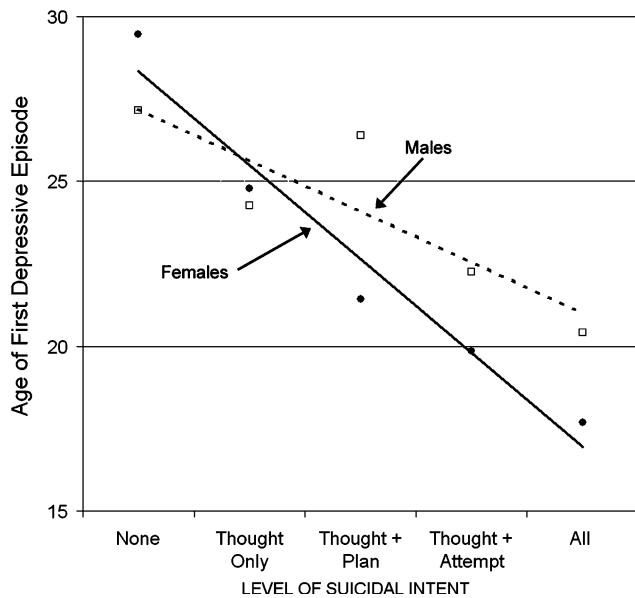


Fig. 2 The influence of gender and level of suicidal intent on the age of first depressive episode

for never-suicidal members of the eldest age cohort. That is, the young, middle, and older age-cohorts each showed a statistically significant linear trend (F values being 35.2, 34.9, and 70.0, respectively; all at $P < 0.0001$). The only departure from linearity was produced by the eldest cohort, which showed the quadratic trend that is evident in Fig. 1 ($F = 4.41$, $P < 0.04$). Thus, the linear trend for suicidal intent holds for all three age groups, with the caveat that, for those members of the eldest cohort who reported an absence of suicidal behaviour, onset occurs at an even later age than a linear trend would predict.

One possible explanation of these findings would be that the younger respondents may have been more depressed at the time of the interview, or were more likely to have been clinically depressed in the past. Although this may appear counterintuitive, the above-noted research showing that depression has been increasing dramatically over the past few decades indicates that young people have shown higher rates than the older cohorts who, by definition, had a much longer risk period. To examine the possibility that this phenomenon might be in play in the present investigation, the three age-groupings of suicide ideators were compared on the prevalence of major depressive disorder. In terms of lifetime prevalence, there was a slight increase across age-groupings (34.3, 40.0, and 43.5%, respectively; $X^2 = 8.14$, $df = 2$, $P < 0.02$), which does not support the hypothesis. This, now,

might be explained by the older respondents having a longer period of risk. However, when comparing the prevalence figures for the previous 12 months only, and thus equalizing the time-risk factor, there was no statistically significant difference across groups (21.4, 19.1, and 18.5%, respectively; $X^2 = 1.26$, $df = 2$, $P = 0.53$). Thus, there is no evidence that the younger respondents were more, or less, depressed at the time of interview.

Although it is true that depression, on average, comes earlier in life for females in comparison to males, this finding also needs to be viewed in the light of its significant interaction with the level of suicidal intent. In Fig. 2, the linear trend lines for these two variables show that, while the level of suicidal intent is meaningful for both sexes, it is more pronounced for women than for men.

Of further interest is the probability of having a particular level of suicidal intent preceded by a level of lower degree of suicidality. The results of this analysis are shown in Table 2. This includes only those individuals who had experienced both levels of the pair in question. For example, of those who experienced suicidal thoughts and had attempted suicide, the average time lapse between the two events was 1.6 years, with suicidal thoughts preceding attempts in 24% of the cases, attempts reportedly first 4% of the time, but with both occurring within the same year in the majority of cases (72%). For all three pairings, the proportion appearing first was in accord with the above-stated view that parasuicidal behaviour represents a progression. However, there were a number of cases (47 in total) where the presumed precursor reportedly occurred after the event that was predicted to precede it. On the face of it, this weakens the theory to some degree, at least as an exhaustive account of the order of events.

Discussion

The findings here support the prediction that the degree of suicidal intent is associated with early onset of depression. This is in line with the view that this represents a pathway of increasing seriousness as one moves from thoughts to plans and attempts [26]. The finding that two of these events were often assigned to the same year with no specification of chronology, suggests that most transitions take place within a relatively short span of time. Further research on this matter could prove to be very useful, but common and appropriate definitions of the elements of the

Table 2 Pairwise comparison of the age of first appearance of parasuicidal behaviours

Lower intent	Higher intent	n	Mean difference (years)	Lower first (%)	Same year (%)	Higher first (%)
Thought	Plan	497	1.5	21	77	2
Thought	Attempt	456	1.6	24	72	4
Plan	Attempt	274	0.4	15	78	7

suicidality dimension are crucial. The NCS data base employed here, for example, uses a definition of suicidal thought that requires it to be “serious” to be recorded. This produces a situation where fleeting thoughts of taking one’s own life will be recorded as non-suicidal behaviour. This will be fine for purposes that benefit from a more serious inclusion criterion, but it will not be as useful for conceptualizations where clear demarcation between suicidal versus non-suicidal matters are at issue, or when (as here) a developmental approach is under study and all, or several, levels would be of interest.

The manner in which early onset was determined leads to the concern that these values may have arisen as an artefact of the age of the younger members of the cohort (being too young to have a late onset). This, however, was dispelled by the fact that the linear relationships between suicidal intent and age of first depressive symptoms were about equal in slope for all three age cohorts (although the cohort averages differed). That is, higher suicidal intent “predicted” a gradient of successively lower average onsets regardless of age at interview. Nonetheless, the fact that younger people showed earlier onsets overall, and the oldest cohort showed the latest onsets, overall, needs to be explained. It is possible again, that the youngest were the earliest overall because they could not, of course, exhibit onsets of depression past the age of 29 years. This would undoubtedly have some effect, but most “onsets” were under age 30 in any case. Another possible explanation is that the older respondents were more likely to forget earlier depressing moments in the mists of time and/or in the context of greater life experience—a danger with retrospectively determined outcome measures. A third explanation may be that the younger respondents did actually experience depression at an earlier age. This latter possibility is consonant with the above-noted evidence that depression rates have been deemed to have risen dramatically in North America over the last few decades (based on similar cohort effects in cross-sectional studies) [7]. Furthermore, rates for social problems, such as crime, divorce, substance abuse and, importantly, suicide, all of which are correlates of depression (and other mental illnesses) have shown a parallel rise [42]. This has tapered off recently, as has the suicide rate. However, since age-cohorts maintain their suicide rates over the life-span [40], depression among young people can be seen as very sinister on a number of levels.

In this vein, the steeper gradient among females might perhaps be viewed as carrying more worrisome meaning, but the fact is that women are not more likely, overall, to take their own lives. This may mean that as intent increases, women are more likely to use suicidal behaviour as a form of communication than are men (possibly without leading to completed suicide), but it might mean that lethality at the more serious levels of intent is actually higher for women.

This could nonetheless leave overall lethality lower for females than for males because the greater number of cases are found among the lower levels of intent. These questions cannot be addressed here, as mortality data that are linked to presuicidal behaviour are required for this type of analysis.

A difficulty with the design is that respondents who declared themselves to be without serious thoughts of suicide (the first question in the suicidality section of the NCS questionnaire) were asked no further questions about suicidal behaviour. The data on multiple episodes of depression showed that some respondents who experienced thoughts plus one other suicidal behaviour reported a reverse-to-expected order. That is, some individuals had recorded a relatively early suicide attempt that was not linked chronologically with a “serious” suicidal thought, but they were “screened in” because of such a suicidal thought that was associated with a later episode of depression. Thus, it is likely that some persons would have not met the inclusion criterion in spite of making a plan or attempt because they recorded a negative response to the “thoughts” question. This might point to an impulsive behaviour, at least in terms of an attempt (it is difficult to conceive of a plan as impulsive), or it might represent differences in the perceived meaning of the term “... seriously thought about committing suicide”. However, these contrary orderings are very low proportionally, and do not provide cause to abandon the general view that suicidal behaviour proceeds from thoughts through plans to attempts and completed suicide. Nonetheless, it seems premature to use suicidal thoughts as an absolute screen for suicidal behaviour in research investigations of this kind.

Conclusions

Overall, the findings support the hypothesis that earlier onset of depression is indicative of a greater intention to take one’s own life. Furthermore, the orderly increase in age of onset across levels of increasing seriousness, while not definitive, provides greater support to the view that suicidal behaviour progresses through levels of intent than it does to the notion that different levels of intent represent different populations. Remembering that this effect appeared in an unequivocal fashion in both genders, the apparently greater effect on females implicates developmental differences through the emotional, social and pubertal aspects of adolescence.

The findings point to the strategic significance of timely intervention with young people who show early signs of mental difficulties (not specifically depression), and furthermore, to the importance of early child development, where mounting evidence is confirming its role in forming the foundation for lifelong adaptation and interpersonal behaviour [29, 39].

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