The mortality of young offenders sentenced to prison and its association with psychiatric disorders: a register study

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Background: We studied the nationwide mortality in Finland of young offenders sentenced to prison, with the advantage of a long-term follow-up in an unselected population. In addition, we aimed to clarify the relationship between psychiatric disorders requiring hospital treatment and early death in young offenders sentenced to prison. Methods: All offenders sentenced to prison between 1984 and 2000 in Finland and aged 15–21 years when the crime was committed were selected for this study. The mortality of the young offenders was compared with the age- and sex-matched mortality data of the general population, obtained from Statistics Finland. Information on hospital treatment periods for psychiatric diagnoses was collected from the Finnish Health Care Register and linked to the mortality data. Results: The study population consisted of 3743 young male and 89 young female offenders. Of these, 435 (11.4%) had died by the end of the follow-up period, including 3 girls. The standardized mortality ratio for young male prisoners was 7.4 (95% confidence interval 6.7–8.1). There was a higher mortality rate among young offenders convicted in the later years of the study period. The causes of death were mostly unnatural and often violent. Hospitalization for a psychiatric disorder or substance abuse was significantly associated with the risk of death. However, hospitalization for emotional disorders with an onset specific to childhood and adolescence were associated with a lower death risk. Conclusion: The mortality rate in the population of young offenders sentenced to prison is alarmingly high. The high mortality in this group is associated with substance abuse and psychiatric disorders, but not with emotional disorders with an onset specific to childhood and adolescence.

Keywords: crime, mental disorder, mortality, psychiatric hospitals

The mortality rate of young offenders is considerably higher than the national average among the same age group.¹–⁴ A recent study found that the overall standardized mortality ratio (SMR) adjusted for age was 9.4 (95% confidence interval 7.4–11.9) for men and 41.3 (20.2–84.7) for women in a cohort of young offenders.⁵ A high mortality rate, owing both to violent deaths and to substance abuse, has been reported among young people with antisocial behaviour⁶ and poor impulse control.⁷ In a Finnish birth cohort, personality disorders together with criminality before the age of 27 years increased the mortality risk significantly, although the mortality risk for men with serious mental disorders without criminality was even higher.⁸ Delinquency is thus strongly associated with premature death. The link between delinquency and mortality is unclear, but impulsivity as a character trait has been suggested.⁹ An American study has found that alcohol abuse and poor self-care in adulthood accounted for some of the excess mortality.¹⁰ A Swedish study concluded that the higher mortality among offenders can be attributed largely to the existence of a small group of alcohol and/or drug abusers who run a high risk of dying prematurely.¹¹

We studied the mortality of young offenders sentenced to prison for serious crime, using a large unselected population with the advantage of a long follow-up. In addition, the Finnish medical register system enabled us to compare the psychiatric morbidity of the young offenders sentenced to prison who died during our follow-up period. This was done in order to clarify the relationship between hospitalizations for psychiatric disorders and early death in the young prison population.

Methods

Permission for this study was granted by the Criminal Sanctions Agency, the Ministry of Social Affairs and Health, and the Department of Psychiatry at the Helsinki University Central Hospital.

The study population was selected from the nationwide Prison Court Register. This register includes all young prisoners who have committed their offences while aged 15–21 years, with the exception of offenders who receive very short sentences (<3 months) or very long sentences (>4 years). Thus, the register includes ~98% of all young offenders sentenced to prison.

The study population consists of all young offenders sentenced to prison from the Prison Court Register who were convicted during the 17-year period from 1984 to 2000. Each young prisoner was entered into the cohort in the year in which he or she was for the last time sentenced to prison as an adolescent prisoner, for which the age range in Finland is between 15 and 21 years. For each prisoner, the date of the prison conviction—the first prison conviction in the case of re-offenders—was obtained and recorded as the beginning of the follow-up period.

Using the personal identification number that is assigned to all residents of Finland by the Finnish Population Register, linkage was performed with Statistics Finland’s Cause of Death Register. All subjects were followed until 30 July 2002, or earlier in the event of their death. The causes of death were classified according to the International Classification of Diseases, according to the eighth revision (ICD-8) until 1986, ICD-9 between 1987 and 1995, and ICD-10 from 1996 onwards.
The numbers and causes of deaths were compared with age- and sex-matched mortality data for the general Finnish population, obtained from Statistics Finland.

The personal identification number was also used to collect data on hospitalizations from the Finnish Health Care Register (HCR, founded in 1967). Information on hospital treatment periods for psychiatric diagnoses was collected from this register for the years 1971–2001.

Mortality is presented in the form of SMRs. Survival was analysed using Kaplan–Meyer survival plots, and group comparisons were made using the log rank test. Odds ratios were calculated using logistic regression and adjusted for the follow-up period.

Results

The study sample consisted of 3832 adolescents and included 89 (2.3%) girls. The number of missing or flawed personal identification numbers varied from 1.0 to 12.5% of the annual samples. The flawed identification numbers belonged mostly to prisoners of foreign origin, and so the sample included practically all prisoners of Finnish citizenship aged 15–21 years during the period 1984–2000. The decline in the annual number of young prisoners is due to changes in jurisprudence that resulted in a substantial decrease in the number of young prisoners sentenced to prison sentences (table 1).

Of the whole study group, 435 (11.4%) had died by the end of the follow-up period, including 3 girls (table 1). The median age at death was 26.6 years (interquartile range 23.4–30.5). The SMR for young male offenders sentenced to prison was 7.4 (95% confidence interval 6.7–8.1) (table 2). The number of female offenders sentenced to prison was too small for the SMR to be calculated. However, when comparing the number of deaths in the study population, the proportion of deaths was significantly higher in the male population than in the female population ($P = 0.01$). There was a higher mortality rate among young offenders convicted later in the study period compared with those convicted earlier (figure 1). During a 3-year follow-up, 2% of the young offenders convicted in 1984–1990 had died, compared with 3.1% of the most recent cohort convicted in 1996–2000.

The causes of death were mostly unnatural and often violent (figure 2). In 217 cases—that is, in the case of almost half the deaths—death occurred while under the influence of alcohol ($n = 94, 43.3%$), drugs ($n = 56, 25.8%$), or both ($n = 67, 30.9%$). Over half of the accidental deaths were due to drug or alcohol intoxication ($n = 100$). The rest were mainly traffic accidents ($n = 27$) and drowning ($n = 13$). Over two-thirds ($n = 116$) of the suicides were committed by violent means; over half ($n = 71$) of those were deaths by hanging and almost a quarter ($n = 27$) by shooting or explosion. Most of the homicides resulted from knife stabbings ($n = 24$). In 4 of the 36 cases that were labelled as natural, the person died of cancers typical of this age range. Of the ‘natural’ deaths, 14 were deaths from respiratory infections and liver and pancreas diseases.

Of all the young prisoners, 2077 (54.2%) had undergone psychiatric hospital treatment before, after, or during their prison sentences. In almost all diagnostic groups this corresponded to a significant increase in the risk of death (table 3). Only hospitalization for emotional disorders with an onset specific to childhood and adolescence was associated with a lower death risk. The SMR for young offenders sentenced to prison who had received psychiatric treatment was 8.3 (confidence interval 7.3–9.4); it was 6.3 (confidence interval 5.4–7.3) for those with no history of psychiatric hospital treatment.

Table 1 Deaths in the Finnish prison population sentenced between 1984 and 2000 for crimes committed at age 15–21 years

<table>
<thead>
<tr>
<th>Year</th>
<th>Total (n)</th>
<th>Excluded owing to missing data (n)</th>
<th>Included (%)</th>
<th>Mean age at first prison conviction (years) (±SD)</th>
<th>Median follow-up (years)</th>
<th>Deaths</th>
<th>Total follow-up (person-years)</th>
<th>Deaths per 10 000 person-years</th>
</tr>
</thead>
<tbody>
<tr>
<td>1984</td>
<td>392</td>
<td>49</td>
<td>12.5</td>
<td>19.7 (±1.7)</td>
<td>18.2</td>
<td>55</td>
<td>5826</td>
<td>94.4</td>
</tr>
<tr>
<td>1985</td>
<td>327</td>
<td>14</td>
<td>4.3</td>
<td>19.7 (±1.6)</td>
<td>17.3</td>
<td>46</td>
<td>5162</td>
<td>93.0</td>
</tr>
<tr>
<td>1986</td>
<td>341</td>
<td>52</td>
<td>15.6</td>
<td>19.7 (±1.6)</td>
<td>16.1</td>
<td>50</td>
<td>5060</td>
<td>105.3</td>
</tr>
<tr>
<td>1987</td>
<td>312</td>
<td>27</td>
<td>8.7</td>
<td>19.6 (±1.6)</td>
<td>15.2</td>
<td>39</td>
<td>4159</td>
<td>93.8</td>
</tr>
<tr>
<td>1988</td>
<td>294</td>
<td>13</td>
<td>4.4</td>
<td>19.8 (±1.7)</td>
<td>14.3</td>
<td>31</td>
<td>3888</td>
<td>79.7</td>
</tr>
<tr>
<td>1989</td>
<td>277</td>
<td>9</td>
<td>3.2</td>
<td>19.7 (±1.6)</td>
<td>13.3</td>
<td>42</td>
<td>3454</td>
<td>121.6</td>
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<tr>
<td>1990</td>
<td>235</td>
<td>7</td>
<td>3.0</td>
<td>20.1 (±1.6)</td>
<td>12.2</td>
<td>24</td>
<td>2759</td>
<td>87.0</td>
</tr>
<tr>
<td>1991</td>
<td>208</td>
<td>8</td>
<td>3.9</td>
<td>19.8 (±1.6)</td>
<td>11.3</td>
<td>25</td>
<td>2225</td>
<td>112.4</td>
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<tr>
<td>1992</td>
<td>219</td>
<td>10</td>
<td>4.6</td>
<td>20.0 (±1.6)</td>
<td>10.3</td>
<td>34</td>
<td>2077</td>
<td>163.7</td>
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<tr>
<td>1993</td>
<td>214</td>
<td>10</td>
<td>4.7</td>
<td>19.9 (±1.6)</td>
<td>9.3</td>
<td>16</td>
<td>1915</td>
<td>83.6</td>
</tr>
<tr>
<td>1994</td>
<td>172</td>
<td>7</td>
<td>2.9</td>
<td>19.9 (±1.4)</td>
<td>8.4</td>
<td>15</td>
<td>1414</td>
<td>106.1</td>
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<tr>
<td>1995</td>
<td>205</td>
<td>2</td>
<td>1.0</td>
<td>20.1 (±1.3)</td>
<td>7.4</td>
<td>13</td>
<td>1546</td>
<td>84.1</td>
</tr>
<tr>
<td>1996</td>
<td>216</td>
<td>5</td>
<td>2.3</td>
<td>20.1 (±1.3)</td>
<td>6.4</td>
<td>11</td>
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<tr>
<td>1997</td>
<td>180</td>
<td>6</td>
<td>3.3</td>
<td>20.1 (±1.4)</td>
<td>5.3</td>
<td>8</td>
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<tr>
<td>1998</td>
<td>160</td>
<td>4</td>
<td>2.5</td>
<td>20.1 (±1.3)</td>
<td>4.4</td>
<td>11</td>
<td>716</td>
<td>153.6</td>
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<tr>
<td>1999</td>
<td>122</td>
<td>3</td>
<td>2.5</td>
<td>20.2 (±1.3)</td>
<td>3.3</td>
<td>3</td>
<td>424</td>
<td>70.8</td>
</tr>
<tr>
<td>2000</td>
<td>140</td>
<td>2</td>
<td>1.4</td>
<td>20.1 (±1.4)</td>
<td>2.4</td>
<td>6</td>
<td>359</td>
<td>167.1</td>
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<tr>
<td>Total</td>
<td>4014</td>
<td>182</td>
<td>4.5</td>
<td>19.9 (±1.5)</td>
<td>11.7</td>
<td>432</td>
<td>43411</td>
<td>100.2</td>
</tr>
</tbody>
</table>
Discussion

We found a 7-fold higher rate of mortality among young Finnish male offenders sentenced to prison in comparison with the age-matched male Finnish population. This confirms the similarity of the European situation to that of the United States and Australia. Early death in our prison group was associated with male sex, and this finding is contrary to earlier reports. However, this gender difference cannot be emphasized owing to the low number of sentenced females. In Finland the number of juvenile prisoners is low by international standards because of the widespread use of conditional prison sentences and special youth punishments. So, those young offenders who are sentenced to prison are guilty of serious crimes or repeated criminal behaviour and may differ from young prison populations in many other Western countries. The growing mortality among young offenders convicted later during the study time is a
any psychiatric disorder versus none 1.58 (1.28–1.96) 113 84
Substance dependence versus no substance dependence 1.62 (1.28–2.04) 128 92
Psychosis versus no psychosis 1.54 (1.07–2.23) 117 99
Personality disorder versus no personality disorder 1.78 (1.40–2.28) 115 97
Childhood onset psychiatric disorder versus no such disorder 0.45 (0.26–0.8) 91 101
Depression versus no depression 1.63 (1.13–2.37) 133 98

Table 3 Odds ratios for death of young offenders sentenced to prison (n = 3832) with or without previous hospitalizations for psychiatric disorders, adjusted by follow-up time

hospitalization | Odds ratio for death (95% confidence interval) | Deaths per 10 000 person-years |
--- | --- | ---
Any psychiatric disorder versus none | 1.58 (1.28–1.96) | 113 84
Substance dependence versus no substance dependence | 1.62 (1.28–2.04) | 128 92
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Depression versus no depression | 1.63 (1.13–2.37) | 133 98

In our study, the main strength is that it was carried out with a nationwide representative cohort of antisocial young offenders sentenced to prison. The median follow-up period was reasonably long, almost 12 years, and owing to the reliability of the registers, we have succeeded in identifying all deaths that happened in Finland during that time. Furthermore, the validity of the Cause of Death Register is very good.

The main limitation of the study is the fact that there were no follow-up data for 182 of the subjects as a result of missing personal identification numbers. These subjects entered the sample mostly in the first few years of the follow-up period and their missing data were due to problems in introducing the personal identification number system. These are random mistakes and thus should not skew the results. On the other hand, in the latter years, the drop-out rate was low and consisted of prisoners of foreign origin. Thus, our findings cannot be generalized to immigrant prisoners. Also, it could be that being incarcerated protects young offenders from death, as some prisoners convicted near the end of the study period remained in prison throughout the follow-up period. This effect was not taken into account in our study, although such an effect would mean that the SMR for young offenders would be even higher than reported here.

The rate of mortality in this particular population of offenders is alarmingly high. Our study proposes that the high mortality in this group is associated with substance abuse and psychiatric disorders but not with emotional disorders with an onset specific to childhood and adolescence.

It is necessary to study in more detail the traits and states that are associated with mortality in young delinquents. Hospital treatment does not seem to prevent early death of young offenders with psychiatric disorders. Young offenders with psychiatric disorders should be identified, treatment programs should be developed, and treatment efforts should be intensified.

Acknowledgements

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Key points

- We studied the mortality of young offenders sentenced to prison in Finland.
- The mortality rate among young offenders sentenced to prison is 7 times as high as that among the general population, and hospitalization for psychiatric disorders or substance abuse is associated with an increased risk of death.
- The mortality rate has increased in recent years.
- There is an opportunity for risk-recognition and intervention when young offenders are serving a prison sentence or under psychiatric care.

References


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