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National alcohol consumption and suicide rates

Alcohol-use disorders have been reported to be associated with the risk of suicide in the general population (Schneider *et al.*, 2009) and in the elderly (Shah and Ganesvaran, 1997). This allows identification of individuals potentially at increased risk for suicide and target preventative interventions at an individual level. Moreover, alcohol is often taken during the process of committing suicide (Conwell *et al.*, 1990). Identification of the relationship between the national consumption of alcohol and suicide rates would support generation of public health measures to reduce the national consumption of alcohol to facilitate reduction in suicide rates. Thus, a cross-national ecological study examining the relationship between national per capita consumption of alcohol and suicide rates was undertaken.

Data on general population and elderly suicide rates for males and females were ascertained from the World Health Organisation (WHO) website (www.who.int/whosis/database/mort/table1.cfm). Data were collected for the latest available year and the median (range) of this latest year across the different countries was 2001 (1991–2003). Data on the national per capita consumption of alcohol were also ascertained from the WHO website (http://www.who.int/whosis/database/core/core_select.cfm). Previous ecological studies have reported an association between suicide rates and gross national domestic product (GDP) (Kiemo, 2004; Shah *et al.*, 2008), per capita healthcare expenditure

(Shah *et al.*, 2008) and divorce rates (Leenaars and Lester, 1999; Lester, 1999). Thus, the relationship between national per capita alcohol consumption and suicide rates in the general population and the elderly in the age-bands 65–74 and 75+ years for both sexes was examined using partial correlations because this method allowed controlling for GDP, per capita healthcare expenditure and divorce rates. Data on GDP and per capita healthcare expenditure was ascertained from the WHO website (http://www.who.int/whosis/database/core/core_select.cfm) for the year 2002. Data on the rates of marriage and divorce were obtained from the United Nations Demographic Yearbook (www.unstats.un.org/unsd/demographic/products/dyb/dyb2006) for the year 2002.

Full data sets were available for 52 countries. The partial correlations between national per capita alcohol consumption and both general population and elderly suicide rates are illustrated in Table 1.

Table 1. Correlation between alcohol consumption and suicide rates

SUICIDE RATE GROUP	CORRELATION COEFFICIENT	P VALUE
Males		
General population	0.28	0.044
65–74 years	0.24	0.08
75+ years	0.30	0.029
Females		
General population	0.2	0.15
65–74 years	0.15	0.28
75+ years	0.21	0.12

There were significant positive correlations between per capita alcohol consumption and general population suicide rates in males and elderly suicide rates in males aged 75+ years; the correlation with suicide rates in males aged 65–74 years approached statistical significance. There were no significant correlations with general population and elderly suicide rates in females.

Methodological issues in cross-sectional ecological studies have been well described in previous studies (Shah, 2008a; 2008b; 2008c) and equally apply to the current study. Caution should be exercised in attributing causation and the direction of causation from this cross-sectional ecological study because of ecological fallacy. The observed associations between national per capita consumption of alcohol with suicide rates in males across the age-bands are consistent with the well-established relationship between alcohol-use disorders and increased risk of suicide from individual-level studies (Shah and Ganesvaran, 1997; Schneider *et al.*, 2009) and ecological time-series studies (Corey and Andress, 1977). National public health policies designed to reduce national alcohol consumption may help reduce suicide rates in males and should be considered in countries with high per capita alcohol consumption.

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