Mortality among Japanese Zen priests

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SUMMARY A cohort study was done on 1396 deaths seen among 4352 Japanese male Zen priests during a follow up period from 1 January 1955 to 31 December 1978. Standardised mortality ratios were computed for major causes of death by comparing with the counterparts of the general Japanese male population. The SMR for all causes of death was 0.82 (p<0.001) and the SMR values for cerebrovascular diseases, pneumonia and bronchitis, peptic ulcer, liver cirrhosis, cancer of the respiratory organs, and cancer of the lung were all significantly smaller than unity. Taking regional mortality differences into account, a similar computation was made dividing the cohort into two subcohorts—that is, the priests living in eastern Japan and those in western Japan. Both subcohorts showed a highly significantly smaller SMR than unity for all causes of death. With the exception of only a few causes of death for which the observed number of deaths was small, they also showed such reduced SMRs for nearly all of the causes of death tested. A questionnaire survey on the current life style of active priests showed that they smoke less, eat less meat and fish as they follow the more traditional Japanese dietary habits, and live in less polluted areas, but their drinking habits do not differ much from that of the average Japanese adult man. Possible reasons for their reduced mortality are discussed.

Recent epidemiological studies have shown a lower mortality from various diseases among certain religious groups. The members of the Church of Jesus Christ of Latter Day Saints known as Mormons and Seventh Day Adventists are particularly notable in this regard, and their peculiar life styles, especially abstinence from smoking and drinking, are esteemed as the main reason for such reduced mortality. A similar lower mortality was also observed among clergymen of the United Presbyterian Church in the United States, the Lutheran Church-Missouri Synod, and some other denominations that do not prohibit smoking.

Zen is known for its strict discipline and harsh ascetic exercise. Zen monks used to be strict vegetarians and they abstained from drinking, smoking, and sexual life because of their religious precepts. Nowadays, however, they are allowed to marry and do not strictly abstain from animal foods, drinking, or smoking. Nevertheless, the traditional precepts are still esteemed to be essential for their religious discipline, as indicated by the fact that monks are required to complete at least several months of a very ascetic training in certain Zen Buddhist monasteries in order to qualify for priesthood. During such courses they are provided with only very plain meals prepared with vegetable foods and are never allowed to smoke or drink. Even after the training course they try to live a plain life, valuing manual labour and sitting in meditation, since simplicity and meditation are the keystones of this group.

This paper will present the results of a cohort study on mortality among Zen priests of a certain sect living in Japan and those of a questionnaire survey made on their current life style.

Materials and methods

We were given permission to see the membership file of the Myoshinji Branch of the Rinzai Sect of “Zen”Buddhism which listed name,”sex, date and place of birth, current address, and “Honseki” (registered domicile) of each priest. The 4352 male priests consisted of retired, active, and associate priests who had been appointed to priesthood on 1 January 1955 or became priests thereafter and who were followed up to 31 December 1978. Their vital status was confirmed by asking offices of municipalities where they lived or still live. For those who died during the observation period, copies of their death certificates were obtained from the district legal affairs bureau at their Honseki, since such documents are legally kept there for 27 years.
after death. The underlying cause of death for each of the deceased was assigned according to the 8th revision of the International Classification of Diseases, Injuries, and Causes of Death. A total of 153 deaths, 11% of the reviewed death certificates, were referred to the nosologists at the health and welfare statistics and information department, the Ministry of Health and Welfare, because there was discrepancy among our judgments.

The observed number of deaths was compared with those expected that were computed by multiplying age (5 year groups), sex (male), calendar year (5 year intervals) specific person-years at risk, by the corresponding cause, calendar year, and age group (5 years) specific death rates of Japanese men. Differences between the observed number of deaths and those expected were tested on the assumption of a Poisson distribution.

The above analysis was made not only on a cohort consisting of all the member priests throughout the nation but also on the two divided subcohorts—that is, the priests residing in western Japan which includes all the prefectures located in the west of Kyoto, Mie, and Wakayama prefecture and those residing in the remaining eastern prefectures.

Since the above study showed a considerably lower mortality among the Zen priests, as described below, a questionnaire survey was made to clarify their life style. A questionnaire containing 24 question items—that is, frequency of intake of foods and beverages such as bread, miso soup, milk, fresh vegetables, green vegetables, vegetables soaked in rice bran paste, pickled radish, salty foods, meat, boiled fish, broiled fish, green tea, and coffee, habits of smoking and drinking, residential environment, and a few others—was mailed to all the 2558 active male and female priests in April 1981. After repeated requests for cooperation 2032 questionnaires were completed (79.4%)—1887 by male priests, 136 by female priests, and nine for which the sex of respondents could not be identified. Only the 1887 replies from the men have been used in the present analysis.

Results

Mortality Study
The total number of priests who entered the study was 4352. Of these, 2802 were alive at the end of the follow up period, 1396 had died, and 154 could not be traced, giving a follow up rate of 96.5%. The underlying causes of death could not be clarified for 53 deaths (3.8%) due to lack of their death certificates.

Table 1 shows person-years by age group of the subjects, indicating that their age distribution centres around 50 to 69.

Table 2 shows that the observed number of deaths from all causes among all the Zen priests was 82% of the expected number of deaths (p<0.001).

Similarly, a substantially and yet statistically significantly lowered mortality was seen for tuberculosis, cerebrovascular diseases, hypertensive diseases, pneumonia and bronchitis, peptic ulcer, liver cirrhosis, cancer of the respiratory organs, and cancer of the lung. SMR values were also low but not significantly so for diabetes mellitus, heart diseases, nephritis and nephrotic syndrome, all external causes, cancer at all sites, and cancer of the oesophagus, stomach, and intestine excluding rectum. For cancer of the rectum, liver, and pancreas the observed number of deaths was slightly higher than the expected but not significantly so.

Table 3 presents the results of a similar computation applied to the two subcohorts that were prepared by dividing all the subjects according to their place of residence. Except for a few causes of death for which the observed number of deaths was small, two subcohorts showed quite similar SMRs for most of the causes of death tested. Furthermore, SMR values were significantly smaller than unity for all causes of death, cerebrovascular diseases, and hypertensive diseases in both subcohorts. SMRs were also under 1 in both subcohorts for tuberculosis, diabetes mellitus, peptic ulcer, liver cirrhosis, external causes, cancer at all sites, and cancer of the stomach, respiratory organs, and lung, but without statistical significance. SMR values for pneumonia and bronchitis and cancer of the oesophagus were significantly small but only among the priests living in eastern Japan.

Life Style Study
Table 4 shows the age composition of the subjects who responded to the questionnaire survey. It was fairly close to the age composition of the cohort used for the mortality analysis. Table 5 shows frequency of intake of nine specific food items. Interestingly, nearly half the priests stated that they never or hardly ever eat bread whereas about 20% of them have
Japanese dietary habits indicate that diets containing fermented "miso" soup are associated with a lower risk of death from some causes, as noted in Table 2. For example, the standardised mortality ratio (SMR) for death from tuberculosis is 0.82*** in Zen priests compared to the expected rate, whereas the SMR for death from cancer is 0.86*.

They also seem to eat meat and fish less frequently than the average Japanese man because less than 10% of the priests stated that they eat these foods almost daily, whereas about 50% of the latter are known to eat meat, fish, or egg almost every day (table 5). It is also notable that slightly less than...
10% of the priests even stated that they never eat these foods of animal origins. This proportion is much larger than the corresponding figure (1.2%) for the average Japanese man aged 18–59.  

Contrary to animal foods, fresh vegetables seem to be frequently eaten by the Zen priests because about 70% of them said that they had such vegetables at almost every meal or every day. Even green vegetables seem to be popular among them. All these facts indicate that most Zen priests nowadays are not strict vegetarians but probably more mindful of eating vegetables than the average Japanese.

For intake of highly salty foods such as salted preserves of fishes, shell fishes, roe, and “tsukudani” (fish, shell fish, vegetables, and seaweeds boiled down in soy), about 9% of the priests answered that they eat them almost every day or even more frequently, whereas about 62% of them stated that they either do not eat, hardly eat, or eat such foods only 1-3 times a month. Corresponding national figures are not available, but our similar survey conducted by the same questionnaire method on the dietary habits of male residents aged 30-69 in a local city gave comparable figures—that is, 16% and 15% as the proportion of frequent consumers of the

same salty foods among 873 subjects with gastric symptoms but with no detectable gastric lesions and among 125 population based random samples of healthy men (M Kuratsune, M Ikeda, unpublished data). Thus the priests do not seem to consume these highly salty foods more frequently than do average men. 

Table 6 also shows that for drinking habits of alcoholic beverages they seem to be fairly like the average Japanese man because about 44% and 25% of them were daily drinkers and those who do not or hardly drink, respectively, while the corresponding national figure for men aged 40–59 were about 47% and 35%, respectively.  

The average amount of alcoholic beverage consumed by priests who drink daily was estimated to be 280 ml as “sake” contains 14% of alcohol. As to smoking habits 53% of the active priests were regular and occasional smokers whereas 45% were ex-smokers or had never smoked (table 6). Compared with the corresponding national figures—that is, 75% for smokers and 25% for non-smokers as investigated in 1978—

the Zen priests seem to smoke less than the average Japanese man. The average number of cigarettes smoked by a smoking priest was estimated to be 19-6 a day. Furthermore, the present survey showed that 87% of the respondents live in areas with no air pollution, whereas 6% live in polluted areas. It was also shown that 92% of all the subjects including those of advanced age serve the Buddha reading the sutras every morning, and 52% sit in meditation at least once every day.

Discussion

This study showed a lower mortality from all causes of death as well as from certain major causes of death among the Zen priests as compared with the average Japanese man. A reduced mortality for all causes of death could be caused by inadequacy in follow up.
Mortality among Japanese Zen priests

Table 6 Percentage of Zen priests by frequency of consumption of coffee, tobacco, and alcohol

<table>
<thead>
<tr>
<th>Frequency of current use</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coffee:</td>
<td></td>
</tr>
<tr>
<td>Never</td>
<td>74.6</td>
</tr>
<tr>
<td>1–2 cups/day</td>
<td>22.2</td>
</tr>
<tr>
<td>3–4 cups/day</td>
<td>1.0</td>
</tr>
<tr>
<td>5–9 cups/day</td>
<td>0.0</td>
</tr>
<tr>
<td>&gt;10 times/day</td>
<td>0.0</td>
</tr>
<tr>
<td>Unidentified</td>
<td>2.2</td>
</tr>
<tr>
<td>Total</td>
<td>100.0</td>
</tr>
<tr>
<td>Tobacco:</td>
<td></td>
</tr>
<tr>
<td>Daily</td>
<td>50.9</td>
</tr>
<tr>
<td>Occasional</td>
<td>2.0</td>
</tr>
<tr>
<td>Ex-smoker</td>
<td>26.5</td>
</tr>
<tr>
<td>Never (life time)</td>
<td>18.7</td>
</tr>
<tr>
<td>Unidentified</td>
<td>1.9</td>
</tr>
<tr>
<td>Total</td>
<td>100.0</td>
</tr>
<tr>
<td>Alcohol:</td>
<td></td>
</tr>
<tr>
<td>Daily</td>
<td>44.2</td>
</tr>
<tr>
<td>1–3 times/week</td>
<td>17.5</td>
</tr>
<tr>
<td>1–3 times/month</td>
<td>11.1</td>
</tr>
<tr>
<td>Ex-Drinker</td>
<td>7.8</td>
</tr>
<tr>
<td>Never (life time)</td>
<td>18.0</td>
</tr>
<tr>
<td>Unidentified</td>
<td>1.4</td>
</tr>
<tr>
<td>Total</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Finally, their reputed moderate attitude in all the aspects of daily life and their mental stableness, both of which could be cultivated by practising self control under the daily discipline of Zen, should also be taken into account because such mental state is believed to exert an over all beneficial effect on their health. We consider that it is no specific single factor but all the factors described above that are unitedly responsible for the observed low mortality among the Zen priests.

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References

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