

Knowledge expand one's life: Evidence from Chinese Science Scholars

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Abstract. One of the solutions of healthcare may lie in the analysis of the longevity of scholars by probing the underlying reasons and determining factors. This study sets out to investigate the reasons why scholars in mathematics, physics, and chemistry generally live a longer and healthier life, and in particular, why longer than the common value, by compiling and analyzing data from information on those scholars. The society at large can learn from the research results of this paper which indicate that reading can, to a certain extent, lead to a long and a relatively healthy life.

1 Introduction

Education-related contributors to health and longevity. Wang (2020) found that economic conditions improved by education, enhanced psychosocial status, and changes in lifestyle all in turn contribute to better health. [1]Erin E. Donovan et al. (2022) argued that after the outbreak of COVID-19, there emerged a need for more theories on communication difficulties, which would help to interpret people's disease and health problems. [2]Nienke Hartemink et al. (2015) argued that human longevity is influenced more greatly by the randomness of living or dying, reproducing or not, and making or not making life cycle transitions, but less by underlying, unobserved heterogeneity. [3]David Yonathan et al. (2020) designed healthy living games to keep people healthy and improve their brain functioning.[4] Alexander J. Horn (2021) mentioned that the demographic transition is characterized by a delay in group health and aging.[5] Jasmin Wertz et al. (2021) made a solid justification that personality scores are positively correlated with physical health due to a healthy life ever since the childhood, less time spent in front of screens, more frequent brushing of teeth, reluctance to smoke and drink, and more physical exercises.[6]

Attitude-related contributors to health and longevity. Ruzica Brecic et al. (2022) noted the importance of positive attitudes toward healthy foods, with children being more positive toward unhealthy foods, which will turn into positive invisible and exogenous attitudes toward healthy foods when entering an older age. [7]Nie Wei et al. (2020) also suggested that interpersonal trust, community identity, social connectedness, social

inclusiveness, and self-induced success play a positive role in promoting the health of population from the perspective of social quality factors.[8]Annabelle McDonald et al. (2022) argued that a balanced and varied diet in Western countries is essential to maintaining health.[9]

With the sustained development of society, health has gradually gained extensive attention and the research on health science has further advanced into a major scientific subject. People's health is an objective reflection of the living standard of people in a region and at a time. From the demographic perspective, the research on health and longevity is formed on a large volume of data. In China, there is a constant quest for health-related issues, as exemplified by the Health China Initiative (2019-2030) released by the State Council, as part of an effort to promote the march toward shared health to accumulate relevant experience in health management.[10]

2 Survival analysis-lifespan table of scholars in mathematics, physics, and chemistry based on the data collected in this paper

Analysis is conducted in this paper using R version 3.6.3 and spss version 26.0, and the following are obtained: (1) table of life span of scholars in mathematics (2) table of life span of scholars in physics; (3) table of life span of scholars in chemistry as shown in Table1, Table2 and Table3.

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Table 1. Table of life span of scholars in mathematics[11]

Age	Effective sample size	Death toll	Death probability	Survival probability	Probability density function	Risk function
38	168	1	0.006	0.994	0.003	0.003
40	167	0	0.000	0.994	0.000	0.000
42	167	1	0.006	0.988	0.003	0.003
44	166	0	0.000	0.988	0.000	0.000
46	166	1	0.006	0.982	0.003	0.003
48	165	0	0.000	0.982	0.000	0.000
50	165	1	0.006	0.976	0.003	0.003
52	164	2	0.012	0.964	0.006	0.006
54	162	2	0.012	0.952	0.006	0.006
56	160	1	0.006	0.946	0.003	0.003
58	159	3	0.019	0.929	0.009	0.010
60	156	7	0.045	0.887	0.021	0.023
62	149	5	0.034	0.857	0.015	0.017
64	144	4	0.028	0.833	0.012	0.014
66	140	0	0.000	0.833	0.000	0.000
68	140	4	0.029	0.810	0.012	0.014
70	136	7	0.051	0.768	0.021	0.026
72	129	6	0.047	0.732	0.018	0.024
74	123	3	0.024	0.714	0.009	0.012
76	120	9	0.075	0.661	0.027	0.039
78	111	10	0.090	0.601	0.030	0.047
80	101	12	0.119	0.530	0.036	0.063
82	89	6	0.067	0.494	0.018	0.035
84	83	19	0.229	0.381	0.057	0.129
86	64	15	0.234	0.292	0.045	0.133
88	49	12	0.245	0.220	0.036	0.140
90	37	12	0.324	0.149	0.036	0.194
92	25	8	0.320	0.101	0.024	0.190
94	17	2	0.118	0.089	0.006	0.063
96	15	4	0.267	0.065	0.012	0.154
98	11	7	0.636	0.024	0.021	0.467
100	4	2	0.500	0.012	0.006	0.333
102	2	1	0.500	0.006	0.003	0.333
104	1	0	0.000	0.006	0.000	0.000
106	1	0	0.000	0.006	0.000	0.000
108	1	1	1.000	0.000	0.003	1.000

Note: The median of survival analysis is 83.67.

Table 2. Table of life span of scholars in physics

Age	Effective sample size	Death toll	Death probability	Survival probability	Probability density function	Risk function
38	147	0	0.000	1.000	0.000	0.000
40	147	0	0.000	1.000	0.000	0.000
42	147	0	0.000	1.000	0.000	0.000
44	147	0	0.000	1.000	0.000	0.000
46	147	2	0.014	0.986	0.007	0.007
48	145	1	0.007	0.980	0.003	0.003
50	144	1	0.007	0.973	0.003	0.003
52	143	0	0.000	0.973	0.000	0.000
54	143	1	0.007	0.966	0.003	0.004
56	142	3	0.021	0.946	0.010	0.011
58	139	2	0.014	0.932	0.007	0.007
60	137	2	0.015	0.918	0.007	0.007
62	135	2	0.015	0.905	0.007	0.007
64	133	1	0.008	0.898	0.003	0.004

66	132	3	0.023	0.878	0.010	0.011
68	129	3	0.023	0.857	0.010	0.012
70	126	3	0.024	0.837	0.010	0.012
72	123	3	0.024	0.816	0.010	0.012
74	120	9	0.075	0.755	0.031	0.039
76	111	5	0.045	0.721	0.017	0.023
78	106	9	0.085	0.660	0.031	0.044
80	97	8	0.082	0.605	0.027	0.043
82	89	12	0.135	0.524	0.041	0.072
84	77	10	0.130	0.456	0.034	0.069
86	67	10	0.149	0.388	0.034	0.081
88	57	11	0.193	0.313	0.037	0.107
90	46	11	0.239	0.238	0.037	0.136
92	35	9	0.257	0.177	0.031	0.148
94	26	6	0.231	0.136	0.020	0.130
96	20	10	0.500	0.068	0.034	0.333
98	10	6	0.600	0.027	0.020	0.429
100	4	3	0.750	0.007	0.010	0.600
102	1	0	0.000	0.007	0.000	0.000
104	1	1	1.000	0.000	0.003	1.000

Note: The median of survival analysis is 84.50

Table 3. Table of life span of scholars in chemistry

Age	Effective sample size	Death toll	Death probability	Survival probability	Probability density function	Risk function
38	186	0	0.000	1.000	0.000	0.000
40	186	0	0.000	1.000	0.000	0.000
42	186	0	0.000	1.000	0.000	0.000
44	186	1	0.005	0.995	0.003	0.003
46	185	0	0.000	0.995	0.000	0.000
48	185	0	0.000	0.995	0.000	0.000
50	185	1	0.005	0.989	0.003	0.003
52	184	0	0.000	0.989	0.000	0.000
54	184	3	0.016	0.973	0.008	0.008
56	181	2	0.011	0.962	0.005	0.006
58	179	1	0.006	0.957	0.003	0.003
60	178	3	0.017	0.941	0.008	0.008
62	175	2	0.011	0.930	0.005	0.006
64	173	2	0.012	0.919	0.005	0.006
66	171	2	0.012	0.909	0.005	0.006
68	169	8	0.047	0.866	0.022	0.024
70	161	6	0.037	0.833	0.016	0.019
72	155	6	0.039	0.801	0.016	0.020
74	149	6	0.040	0.769	0.016	0.021
76	143	7	0.049	0.731	0.019	0.025
78	136	11	0.081	0.672	0.030	0.042
80	125	12	0.096	0.608	0.032	0.050
82	113	14	0.124	0.532	0.038	0.066
84	99	7	0.071	0.495	0.019	0.037
86	92	16	0.174	0.409	0.043	0.095
88	76	17	0.224	0.317	0.046	0.126
90	59	14	0.237	0.242	0.038	0.135
92	45	12	0.267	0.177	0.032	0.154
94	33	15	0.455	0.097	0.040	0.294
96	18	8	0.444	0.054	0.022	0.286
98	10	5	0.500	0.027	0.013	0.333
100	5	5	1.000	0.000	0.013	1.000

Note: The median of survival analysis is 85.43

3 Analysis of the Causes of Scholars' Deceases

The causes of 53 scholars' deceases have been revealed by the data in this paper, which were then categorized and sorted, and it is evident from the results that the main diseases that caused the 53 scholars' deceases are as follows: heart disease accounted for 33.96%, malignant neoplasm for 37.74%, cerebrovascular disease for 9.43%, digestive system disease for 7.55%, respiratory system disease and urinary system disease for 5.66% respectively as shown in figure1. When comparing the data from the Beijing Center for Disease Control and Prevention, the ranking of the causes of scholars' deceases exactly overlaps with the top ten causes of death for male residents in Beijing. The results are presented here in the hope of drawing the attention of scholars and the public and persuading them to take care of their health conditions and live a long and healthy life.

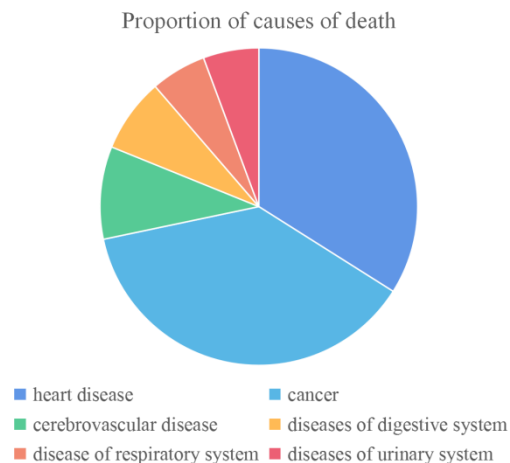


Figure 1. Proportion of the Causes of Scholars' Deceases.

In light of the study results, the following recommendations are proposed: first, it is suggested that scholars and the general public should enhance their health awareness, learn more and be more aware of healthcare information as well as healthy lifestyles, and maintain good living habits; second, it is advisable to regulate living habits and not stay up late at nights; third, try not to hold health-damaging habits such as smoking and excessive drinking; and fourth, keep daily exercises on a proper basis to prevent health-threatening chronic diseases such as hypertension, cardiovascular diseases, chronic respiratory diseases and diabetes.

4 Conclusion

The life expectancy statistics of 501 scholars in China, as presented in Table 2, demonstrate that the median life expectancy of mathematicians, physicists, and chemists is 82.50, 84, and 85 years, respectively. This is in contrast to the median life expectancy of 78.58 years, as reported by China Life in 2010, for the entire country. The analysis, which is based on the survival data of 501 academics, as depicted in Figure 1, highlights the fact that the academic community has a longer lifespan than the general population. Thus, it can be concluded that mathematicians,

physicists, and chemists are among the longest-lived individuals in China. This conclusion is further strengthened by the interviews of four mathematics and statistics professors, which suggest that diligent study and productive thinking may, to some extent, contribute to a long and healthy life. However, the generalizability of this result must be investigated in a larger context.

Acknowledgement&Appendices

This article is completed as part of Higher Education Reform Project of Guangdong Province under grant 2021005.

The following supporting information can be downloaded at <https://data.mendeley.com/datasets/t35xz3ntj6/1>

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