The status quo of the old people participating in marathon--take Beijing marathon as an example

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ABSTRACT. *Using documentary, logical analysis, mathematical statistics method, interview method, method of knowledge map and CiteSpace tools, methods, such as selection in hownet (CNKI) databases in China Peking University core periodical database and Chinese social science citation database (CSSCI), is given priority to with "marathon" and "elderly" inscription, incorporated into the study conforms to the standard. This paper summarizes and analyzes the development of the research on the elderly's participation in marathon. The elderly aged $\geqslant$60 who participated in the Beijing marathon from 2015 to 2018 were selected as the research objects, Explore the impact of marathon on the elderly to promote their physical and mental health. It provides the beneficial reference value for the elderly to improve their functional level. The research conclusions are summarized as follows:1.With the hot development of marathon, showing the evolution characteristics of increasing range of marathon objects, increasing number of researchers, expanding research field and enriching research content.2.The number of elderly people ($\geqslant$60 years old) participating in the Beijing marathon from 2015 to 2018 has been increasing, showing a trend of faster speed for men and more and more women.3.In the Beijing marathon, the number of elderly people ($\geqslant$60 years old) who finish the race from 2015 to 2018 keeps increasing, and their completion time for the Beijing marathon is faster every year, among which the average completion time for the age group of 60-64 is faster than the total average completion time every year. The average completion time for the 65-70 age group is close to the overall average completion time.*

KEYWORDS: *Exercise; The elderly; Cluster of common words; Beijing marathon*

1. Introduction

In recent years, marathon has suddenly become popular and formed a running craze represented by "marathon fever" in the society. The main characteristics of marathon include clustering, practicality, externality and comprehensiveness. These characteristics determine the comprehensive characteristics of marathon, and can play an important role in enhancing people's physical fitness, enriching people's leisure life, driving economic development and urban construction. With the

increasing aging of the society, the proportion of the elderly in China is increasing, and there are more and more "empty-nesters". At this time, the marathon sport presented an expanding scene of ten thousand people running at the same time, which attracted heavier elderly people to start running year after year, day after day, and then became one of the race tracks, thus gaining social recognition. Beijing marathon is the "national horse" of our country. It has been held for 37 years, and its characteristics have always attracted more runners to participate.

2. Results and analysis

2.1 Visualized analysis of citespace-based elderly group participating in marathon

In the era of network resource explosion, Among them, citespace information visualization software developed by professor Chen chaomei from school of computer and information science of drexel university occupies a certain position in scientific technological text mining and visualization.(retrieval time: 2019-1-12), the data obtained is shown in figure 1.The core journal database of Peking University and Chinese social science citation database (CSSCI) were selected from CNKI database, with "marathon" and "elderly" as the main subjects, and the included research met the following criteria. The subjects of the study were elderly people and experimental research. A total of 496 articles were retrieved on the subject of marathon and elderly people, and 241 articles were downloaded after 255 articles irrelevant to this study were removed. The data sources are shown in table 1, and the selected papers are visualized in figure 1.

Table 1 Data sources

Retrieve the theme	Marathon, senior citizens
The retrieval scope	China academic journal network publishing general library, foreign language journals
Retrieve the fixed number of year	There is no limit
Retrieval type	Retrieval type A :(core journal =Y or CSSCI journal =Y) and (subject= marathon or title = marathon or v_subject= Chinese and English extension) (fuzzy matching)Retrieval type 8: (theme OR title = = marathon marathon OR v_subject = extension (marathon, contrast in both Chinese and English) in both English and Chinese) and (((topic = marathon) OR (title = marathon) OR (v_subject = marathon))) and topic (= the old title = the elderly OR v_subject = extended (the elderly,) in both Chinese and English) in both English and Chinese (fuzzy matching) retrieval type C: (core journals = Y OR CSSCI = Y) and periodicals(subject= marathon or title = marathon or v_subject= Chinese and English)
Theretrievalresults	496 journal articles

(1) Keywords network analysis, parameter configuration and network operation result analysis

Clarify the marathon and research status of the elderly in China, the 241 articles were imported into the CiteSpace, analysis time is set to 1983-2019, every year is divided into a period of time, source text keyword choice literature, network node selection keywords, visual results show that overall network clustering to static view, select the interface parameters such as table 2.The specific parameters of system feedback after operation are shown in table 3, and the intuitive view is shown in figure 2.

Table 2 Keywords network analysis parameters

Main options	Parameter Settings
Time Slicing	Form 1983 to 2019# year Per Slice 1 1983 to 2019, split each year)
Tex Source	Title+ABSTRACT+Author Keywords(DE)+KeywordsPlus(ID)
Selection Criteria (extract node threshold)	M ě I ge shiji ā n qi ē pian nei pinci ch ū xian li, M: ng ci DE gu ā njian ci(keywords that appear twice in frequency in each time slice)
Visualization Visualization	Culster view-static +show Merged Networks Culster view-static +show Merged Networks

Table 3 Parameter configuration and network operation results

Time slice (1 year)	Node threshold	The total space	node	Extract the number of connections/total number of spatial connections
1983-1983.	The top 30	12	0	0/0
1984-1984.	The top 30	0	0	0/0
1985-1985.	The top 30	0	0	0/0
1986-1986.	The top 30	0	0	0/0
1987-1987.	The top 30	0	0	0/0
1988-1988.	The top 30	0	0	0/0
1989-1989.	The top 30	0	0	0/0
1990-1990.	The top 30	4	0	0/0
1991-1991.	The top 30	7	0	0/0
1992-1992.	The top 30	26	2	0/0
1993-1993.	The top 30	10	0	0/0
1994-1994.	The top 30	8	0	0/0
1995-1995.	The top 30	3	0	0/0
1996-1996.	The top 30	12	0	0/0
1997-1997.	The top 30	6	0	0/0
1998-1998.	The top 30	0	0	0/0
1999-1999.	The top 30	22	0	0/0
2000-2000.	The top 30	30	1	0/0
2001-2001.	The top 30	8	1	0/0
2002-2002.	The top 30	35	1	0/0
2003-2003.	The top 30	0	0	0/0

2004-2004.	The top 30	46	1	0/0
2005-2005.	The top 30	33	2	0/0
2006-2006.	The top 30	43	1	0/0
2007-2007.	The top 30	17	1	0/0
2008-2008.	The top 30	48	4	On January 1
2009-2009.	The top 30	30	2	On January 1
2010-2010.	The top 30	7	2	On January 1
2011-2011.	The top 30	56	3	On January 1
2012-2012.	The top 30	27	1	0/0
2013-2013.	The top 30	34	2	0/0
2014-2014.	The top 30	63	3	0/0
2015-2015.	The top 30	41	1	0/0
2016-2016.	The top 30	31	2	On January 1
2017-2017.	The top 30	123	10	On November 11
2018-2018.	The top 30	106	13	20/20
2019-2019.	The top 30	35	2	0/0

(2) Co-occurrence analysis of keywords in marathon research

After that, it enters the visual interface of CiteSpace and analyzes the co-occurrence of keywords of 241 papers downloaded. When analyzing keywords, select the Noda Type as the Keyword. After setting relevant parameters, click GO to get the map of the original Keyword's coterm network. As shown in figure 2, each circle in the graph represents a keyword (node), and the size of the circle represents the number of people who write keywords in a proportional way. The more people there are, the bigger the circle is. The line between nodes represents the research around keywords, the thickness of the line represents the level of research, and the thicker the line, the more research. As shown in figure 3, figure 1 upper left Signnature (annotation information) can be seen that the Mr Node N = 22, the attachment E = 26, Density (network Density) is 0.1126, Modularity modular network will be shown after the clustering analysis of evaluation indexes, the greater the Modularity value of a network, said the network get better clustering effect, Q value interval [0, 1], the Q > 0.3 means that the network community structure is significant; Silhouette is a sign of network homogeneity, and the closer you get to 1, the higher the network homogeneity will be. When Silhouette is 0.7, the clustering result will be highly reliable.

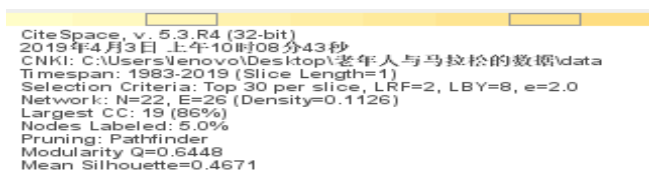*Figure.1 Co-occurrence of eywordsinmarathonresearch*

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CiteSpace, v. 5.3.R4 (32-bit)
2019年4月3日 上午10时08分43秒
CNKI: C:\Users\lenovo\Desktop\老年人与马拉松的数据\data
Timespan: 1983-2019 (Slice Length=1)
Selection Criteria: Top 30 per slice, LRF=2, LBY=8, e=2.0
Network: N=22, E=26 (Density=0.1126)
Largest CC: 19 (86%)
Nodes Labeled: 5.0%
Pruning: Pathfinder
Modularity Q=0.6448
Mean Silhouette=0.4671
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Figure.2 Key word parameterdiagram

2.2 Analysis of the development of Beijing marathon

The first Beijing marathon was held in 1981 and has been held successfully for 37 years. Once a year, it is the product of the highest degree of market access, the largest single scale, the largest number of participants and the most representative activities. Another historic turning point since northern marseille began this year is the cancellation of the half marathon. It established only one complete event and became the first all-horse race in China. From the first 84 in 1981 to 28,235 in 2018.

2.3 Data analysis of Beijing marathon completion from 2015 to 2018

(1) Completion rate analysis

Can be seen from table 4, from 2015-2018 Beijing marathon finish rate is higher and higher, the rate of finished behind rising, is increasingly perfect event organization, good competition atmosphere, suitable weather, good volunteer service and sponsor of joint services, and the positive enterprising north ma players, such as create a right place, right time and, be short of one cannot. It also shows that people of every age group have a growing awareness of finishing the Beijing marathon and are increasingly strict in their training. According to big data, in 2018, the number of public runners entering 330 reached a new high of 3,894, accounting for about 14 percent of the total number of runners who finished the race. That's up 4 percentage points from 10 percent in 2017. The trend for 2017 was "faster men, more women," while the most significant trend for 2018 was "faster men and faster women."

Table 4 Completion data of Beijing marathon from 2015 to 2018

	In 2015,	In 2016,	In 2017,	In 2018,
Starting number (person)	29773	30302	29700	29115
Number of finishers (person)	26294	28957	28957	28235
Completionrate (%)	88.23%	95.56%	95.51%	96.98%

(2) Average completion time analysis

As can be seen from table 5, the speed of both men and women is increasing year by year. In 2018, the average score of beima was 4:27:18, which was the first time that the average score dropped to less than 4 hours and 30 minutes since 2015.Statistics also found that since the horse era, the average time to finish the race of the northern horse speed up about 4 minutes per year. And 2018 saw a historic breakthrough with 532 runners crossing the 3-hour mark.an average of nearly 17 people a minute to the end, an average of three seconds more than one person on the line.

Table 5 Comparison of average finishing time between 2015 and 2018

	In 2015,	In 2016,	In 2017,	In 2018,
The entire	4:42:52	4:38:35	4:32:31	4:27:18
man	4:38:53	4:34:25	4:27:05	4:22:31
The women's	5:02:08	4:58:25	4:54:48	4:49:56

2.4 Analysis of the elderly participating in the Beijing marathon from 2015 to 2018

(1) Analysis of the number of people who finished the race

According to the research results, the number of elderly people participating in Beijing marathon showed an increasing trend from 2015 to 2018. No matter the number of men and women was increasing, the number of men was more than that of women. In 2016, 629 people participated in the full marathon and finished the race safely, a record high.

Table 6 Number of elderly people who finished the race in 2015 to 2018

More than 60 years of age	In 2015,	In 2016,	In 2017,	In 2018,
Male (person)	445	577	553	519
Female(person	42	52	75	51
Totalnumber (person)	487	629	628	570

(2) Analysis of the average finishing time of the elderly from 2015 to 2018

North horses, known as the ginger is old spicy tradition, as the growth of the age, most people may feel that will be more and more slow, but the results show that each age group from 2015 to 2018, average finished faster and faster, and 60-64 - year - old average finished achievements every year faster than the horse finished the total average grades and average finish faster than other age groups; The other two age groups also finished faster than the global average. According to the official website of beima, in 2018,

the average time of 55-59 years old group was 4:17:57, taking the first place in the age group by 15 seconds and winning the title for four consecutive times. The result of the race will be renewed next year.

Table 7 Comparison of average finishing time of elderly people in Beijing from 2015 to 2018

	Average finish time between 60 and 64 years old	Average finish time of 65-69 years old	Average finish time over 70 years old	Overall average finish time
In 2015,	4:35:33	4:47:49	5:07:30	4:42:52
In 2016,	4:30:58	4:37:36	4:55:11	4:38:35
In 2017,	4:25:25	4:35:27	4:59:26	4:32:31
In 2018,	4:22:12	4:28:46	4:52:09	4:27:18

2.5 Discuss

Marathon is of great benefit to the human body. It can make the lonely no longer lonely. It is the solitude of a lonely person, but it is the carnival of a group of lonely people. It belongs to the typical physical endurance project, give priority to with aerobic metabolism, belongs to the movement of long time running, marathon, the nation's very keen on sports, with the most full marathon race more, through the marathon movement can make each runner directly control the body to cope with the surrounding seemingly chaotic state of life, reveals the runners of individual life concept and way of life, in a world of uncertainty increase gradually found a sense of control, and in a certain sense, realize the return of subjectivity.

In this study, it was found that in the marathon, without the pursuit of speed, it requires at least three years' running experience to participate in the full marathon, and the monthly running capacity is 150-300km, and the average daily running is 5-10km.However, for the average completion level of the elderly from 2015 to 2018, the speed per kilometer should be between 6-8min, and the distance of 42.095km should be insisted at this speed before the race is completed. To participate in the race, it needs a certain running age and accumulation of running capacity. Participating in short-term aerobic exercise did not restore immune function to the level of healthy older people in previously sedentary older people. A large amount of data has proved that the risk of sudden death of elderly people who insist on long-term endurance exercise is lower than that of people who do not insist on exercise, let alone those who do not pay attention to physical activity. Thus keeps the elderly population in city marathon, by foucault called self technology, excavated the survival of aesthetics, or through the interaction of these habitus and field running and running a marathon can say has become a part of their daily lives, become a kind of normal life, form a culture of the group. They get psychological satisfaction and pride by participating in this subgroup culture. Therefore, long-term marathon exercise can improve the physiological function of

middle-aged and elderly people, effectively reduce or control blood pressure, improve cardiopulmonary function, enhance flexibility and balance ability, and have a positive effect on preventing cardiovascular and cerebrovascular diseases and improving human health.

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