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Relational Structure of the Healthy Longevity with A Family Physician and A Family Dentist in The Elderly Dwellers

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1. Abstract

1.1. Background

With the increase in lifestyle-related diseases, countermeasures are becoming very important. It has been shown that having a family doctor or a family dentist is of great significance for the prevention of illness. However, along with the actual situation, the relationship with health and longevity according to the presence or absence of a family physician or a family dentist has not been clarified.

1.2. Objective

The purpose of the research is to clarify the actual situation of having a internal physician and or family dentist for the elderly living in the suburbs. Furthermore, the socio-economic factors behind this are to clarify the relationship between three health factors, including subjective health, and illness prevalence and daily living ability. In the final the purpose of this research is to make clear the causal structure between the subjective health after 3 years and the healthy longevity, which is a dependent variable that is defined as the survival days for the next 3 years as an observation variable by the existence of the internal physician and the family dentist by gender.

1.3. Methods

As for the survey method, a self-administered questionnaire by mail was conducted in 16,462 suburban elderly dwellers in Tama city of Tokyo in September 2001. Responses were obtained from 13,066(response rate of 79.4%). A similar survey was conducted in 2004. We analyzed a total of 7,905 subjects, including 3,754 males and 4,151 females aged 65 to 84, from among those who were able to clearly determine the need for long-term care after 3 years and maintain their survival day for next 3 years. Following three years from 2004 to 2007, we confirmed the death dates of 278 men and 160 women.

1.4. Result

According to this study, elderly people with desirable socio-economic factors had only a family dentist. At the same time, a related structure was shown in which the degree of care required was maintained together with three health factors, and as a result, and healthy longevity with high level of the subjective health had been maintained. This related structure could explain 54% of healthy longevity. At the same time, a similar tendency was shown by gender. Future research topics will require the use of oral care, and health indicators such as blood pressure and blood glucose levels. It is also expected that the external validity will be enhanced by analyzing the causal structure by intervention studies including a randomized control group.

1. Forward

In a country that is rapidly aging society, much more attention should be focused on the healthy longevity [1]. Healthy longevity would reduce not only the burden of long-term care, but also linke to the stabilization of medical and long-term care costs. Above all, it is significant that the person himself or herself maintains the quality of life and lives affluently. Under these circumstances, Japan has announced the Healthy Japan 21 aiming for both prevention of the premature death and promoting healthy longevity in 2000 [2]. This plan clarifies the plan to maintain oral care, which is the basis of a rich diet, as well as measures to favor lifestyle-related habits including smoking cessation and

desirable diet. Family dentists may have a main role for promoting desirable oral care. On the other hand, family doctors play a large role in the prevention and treatment activities of various diseases as well as various health checkup activities and to improve the advisable lifestyle habits. The Japan Dental Association defines a family dentist as follows [3]. With a dentist who not only provides safe and secure dental care, but also has a wide range of knowledge and insight related to medical care and can fulfill its responsibilities as a person who plays a part in regional medical care with the aim of maintaining and improving oral function throughout the life of residents. On the other hand, the Japanese Medical Association defines a family doctor as follows. It is defined as a home medical doctor that can be used to discuss anything related to health and to refer the patients to a specialized medical institution when necessary [4]. The characteristic of Japan's medical system is not the registered medical system as in the United Kingdom, but the free practitioner system in which patients freely visit clinics, hospitals, and dental clinics. The Government of Japan announced. The Long-term Strategic Guideline Innovation 25(2007) [5], embodying the need to shift from medical care with therapeutic filling to a health care system that emphasizes preventive health promotion. In order to promote new strategies in such a situation, the role of family doctors and family dentists who support the prevention of diseases and maintenance of health of citizens was expected. After that, the Government of Japan aimed to realize a safe life for the elderly in the region through. The New Growth Strategy 2010 [6]. Regarding the relationship between the existence of a family dentist and the subsequent maintenance of survival, the authors tracked the survival days of 16,462 elderly people living in the suburbs of the city for 6 years. We have reported that the cumulative survival rate thereafter is significantly maintained for both men and women compared to the group without a family dentist [7,8]. However, the presence or absence of a family dentist is self-reported, and the detailed mechanism including the diagnosis of oral hygiene linked to the role and function of the dentist and the significance of survival has not been clarified. Therefore, since 2009, we have been conducting joint research with the Shiba Dental Association in Minato-ku, Tokyo and with Tokyo Metropolitan University in order to clarify the causal structure in which survival is maintained [9]. We investigated the level of emphasis on prevention, and at the same time, we investigated the actual condition of oral self-care, the oral hygiene situation diagnosed by dental doctor, and the richness of food and subjective health. As a result, the more who have visited the dental clinic with an emphasis on prevention, the better the oral care with the support of dentists and dental hygienists, and the more frequently using an interdental brushes linked to the survival days [9]. Extensive research reviews have shown that the health support of family physicians reduces health risks and results in sustained survival in this way. The desired HBA1c is 7% or less, the systolic blood pressure is 120 to 139 mmHG and GFR indicating renal function is 60 ml/mor more. By April 2021, 22,099 research papers on the relationship between risk factors for diabetes and hypertensive disease and subsequent mortality were reviewed. These meta-analyses have been reported showing that various diseases and mortality risk factors are controlled by the core medical activities of family doctors, and as a result, survival is maintained [10]. Since oral infections such as tooth decay and periodontal disease are risk factors for infectious pericarditis, Yamada et al [11] have been reported that it is necessary to remove the source of infection in the oral cavity as dental care by coordinating medical examinations before surgery for congenital heart disease. In this way, It is important for doctors and dentists to work together. Waza et al [12] analyzed 16,824 recipients in one year who were examined as family doctors in an urban clinic, presented the referral rate and hospitalization rate as a triage function in primary care, and proposed to try to triage the distribution. However, no referral cases were found from the family doctor to the family dentist. The role of the family dentist is not limited to supporting oral hygiene self-care. There were reports on the detection of cancer in the oral cavity and the early detection of cancer [13,14]. Therefore, it is one of the indispensable functions for improving the health maintenance effect by early detection of mortal diseases by referral from a family dentist to a specialized hospital medical care. Shioda et al [13]. Reported that the diagnostic technique for oral cancer has improved and that oral function has been restored after treatment. Sufficient oral hygiene has also been reported to reduce the risk of esophageal cancer by Sepehr et al [14]. Thus, the role and function of the family dentist, as well as the causal structure of subsequent survival and longevity, have been reported. However, PubMed and Japanese Literature Searches have not reported the relationship between not only the dentist but also the having an internal physician and socio-economic factors, and the subsequent relational structure between the need for long-term care and healthy longevity. The purpose of the research is to clarify the actual situation of having an internal physician and or dentist for the elderly living in the suburbs. Furthermore, the socio-economic factors behind this are to clarify the relationship between three health factors, including subjective health, and illness prevalence and daily living ability. In the final the purpose of this research is to make clear the relational structure between the subjective health after 3 years and the healthy longevity, which is a dependent variable that is defined as the survival days for the next 3 years by the existence of the internal physician and the dentist by gender.

2. Method

2.1. Subjects

In September 2001, we targeted a questionnaire survey to all elderly individuals aged 65 years and over who lived at home in suburban Tokyo, Tama City, Japan. Of 16,462 eligible elderly

individuals, 13,066 people (79.4% as a respondent percentage) gave informed consent to participate in the study and returned the self-administered questionnaire by mail. In September 2004, we sent via mail a second questionnaire which was the same as used previously to the respondents, and 8,558 participants responded (505 cases had moved, 914 were deceased and 3,218 did not respond). We followed up all of the participants until August 31, 2007. We analyzed a total of 7,905 subjects, including 3,754 males and 4,151 females aged 65 to 84, from among those who were able to clearly determine the need for long-term care and maintain their survival. Following three years from 2004, we confirmed the death dates of 278 men and 160 women through the municipal resident's registry. The city used as the study setting had developed partly as a commuter town to accommodate increased workers and their families in the metropolitan Tokyo area between the period of the 1970s and 1990s, which included a recent era of high Japanese economic growth. The majority of dwellers were middle class. The total population of the city was approximately 145,862 as of 2000 with 11.1 per cent of the population aged 65 years or older. This number was 64.1% of the national average 17.3% in 2000.

2.2. Research Contents and Research Methods

Questions about family dentists and family physicians were used with the option of distinguishing between medical doctors and dentists, asking who usually receives treatment or consults about health. Socio-economic status in 2001 was assessed via educational attainment and annual income. Levels of educational attainment were categorized into three groups; graduation from senior high school, graduation from junior college, those achieving a higher educational level than college and those who did not want to respond. Annual income levels fell into five categories; less than one million Japanese yen (equivalent to less than US $13,000), less than three million yen, less than five million yen, less than nine million yen and more than nine million yen in 2001. As an observation variable of socio-economic factors, we added not only educational background and annual income but also height as one of the factors. The reason is that a certain amount of height growth is one of the indicators that support a rich and healthy life experience in childhood. Height has been reported to be a highly valid indicator of survival prognosis after about half a century. According Jousilahti et al [15]. Follow up research, total number of 31,199 adults resident in East Finland were followed for 15 years and reported that their short of height increased the subsequent overall mortality rate. Similarly, the production of 13,460 elderly people in the suburbs of our country for 3 years is being followed. As a result, it was reported that the mortality rate of the males with a height of less than 150 cm and the females less than140 cm were significantly higher than that of the taller group [16]. The three health-related dimensions examined in our study consisted of physical, mental, and social health components. Physical health parameters included the basic activities of daily living (BADL) and the instrumental activities of daily living (IADL) as well as the number of diagnosed diseases from which the respondents had suffered from at the time of the 2001 survey. The BADL score was assessed by three questions: “Can you go to the toilet by yourself?”, “Can you take a bath by yourself ?” and “Can you take a walk outside by yourself ?”. Individuals obtained one point if they could perform these functions, and overall scores ranged from 0 to 3 with higher scores indicating a greater level of basic activity competence. The IADL score was measured via five questions related to instrumental activity: “Can you buy daily necessities by yourself?”, “Can you cook daily meals by yourself?”, “Can you deposit and withdraw money in a bank account?”, “Can you complete documents related to insurance and pensions?” and “Can you read books and newspapers?”. As the IADL was scored in a similar fashion to the BADL, total scores ranged from 0 to 5 with higher scores indicating greater instrumental activity. The total of ADL and IADL was used as a daily activity ability benefit, and the scale was set from 0 to 8. The prevalence of comorbidity was determined by instructing the individuals to “Choose the diagnosed diseases with which you now are treated”. We discovered five diseases (cerebrovascular disease, cardiovascular disease, hepatic disease, liver disease, and diabetes mellitus) that were significantly and negatively associated with the number of survival days of the respondents between September 2004 and August 2007, and thus the extent of comorbidity was defined as the number of diseases with which the respondent was diagnosed among these five. Once you have no illness, we calculated the number of spaces from 0 to 5 points. Mental health was determined via Subjective Health, Subjective Health at the time of the 2001 and 2004 survey. Subjective Health was quantified via a four-point likert scale using questions pertaining to the respondent’s perceived overall health: “In general, would you say your health is: very poor, poor, fair or excellent?”. The degree of health care was used in order to detect elderly health conditions in September 2004 using a public assessment tool devised by the Japanese Ministry of Health, Labour and Welfare. This tool is comprised of six levels ranging from the lightest degree (requiring mild support) to the most severe degree (requiring comprehensive care). In our analysis, a respondent that had received no care scored zero, while a respondent scored 1 if assigned at the lightest degree and scored 6 if assigned at the most severe degree.

3. Method

An agreement has been signed between the Tama city local government and the Tokyo Metropolitan University regarding the protection of privacy and confidentiality. Here, it is clarified that mutual confidentiality is strictly enforced. All analysis data is still supported by ID only. The survey was conducted with the consent of the Tokyo Metropolitan University Graduate

School of Ethics Committee on September 16, 2000. All data obtained were evaluated by score or degree to examine differences between males and females using the Kendall's tau rank correlation coefficient. Exploratory factor analysis was used to fit all of the observed variables to corresponding latent variables. This analysis was performed by the maximum likelihood procedure and a Promax oblique rotation, using SPSS Statistics 27 for Windows (IBM Inc.). We used structural equation modeling (SEM) to examine presumptive underlying relational structure between the latent variables by AMOS ver.27 for Windows (IBM Inc.). The analyses were performed using a cross- lagged effects variation model with longitudinal data followed over six years. Four latent variables were fitted with Socio-economic status and three health-related dimensions as causes using data obtained in the 2001 survey, condition of the bed-ridden status as intermediate causes using data from the 2004 survey, and survival days days from 2004 to 2007. All observed variables corresponding to the three health-related dimensions were collected at the questionnaire survey in September 2001. Estimation of the best-fitting model was carried out by the method of maximum likelihood of SEM. The optimization algorithm was implemented with no-missing-data parameters. The direct, indirect, and total standardized effects of different latent variables on the endogenous health and life condition variable were measured by gender. The models employed indices criteria for assessing model fitness. Goodness-of-fit was approved by NFI (Normed fit index),1FI (Incremental fit index), RMSEA (Root mean square error of approximation). Results were regarded as statistically significant if the p value was less than 0.05.

4. Results

4. 1. Subjects by Gender and Age Groups

In this study, we analyzed 4,151 males and 7,905 females. Women tended to have a significantly higher proportion of older people than men.

4.2. Distribution of the Family Physician and or Family Dentist

We analyzed the relationship between the actual condition of the family physician and the family dentist and the number of days of survival thereafter. They were classified into the following 4 groups in descending order of survival days. The longest-lived sentence was for only a family dentist, and the second longest-lived group had no family physician or dentist. The third group was a group having both family physicians and family dentists. The shortest survival group was having only family physicians. The ratio of having both a family physician and a family dentist was the highest at 60.6%. The next highest percentage was 17.2% with only a family physician, followed by 12.7% with only a family dentist. The percentage of family physicians who are present has increased significantly with age. On the other hand, the proportion of only family dentists decreased significantly with aging. There were 679 people who were uncertain whether they had a family physician or a family dentist. The longest three-year survival was in a sentence with only a family dentist, 1,042.9 days for men and 1,054.7 days for women. On the other hand, in the group having the family physician, it was 1,031.0 days for men and 1,036.7 days for women (Table 1). A significant difference was found only in women when comparing the number of survival days between the group with only a family dentist and the group with only a family physician ($P<0.001$).

4. 3. The Relational Factor by the Family Physician and or Family Dentist

We analyzed the relationship between socio-economic factors and living characteristics according to the presence or absence of sentences that only family dentists can enter and those that only family doctors can enter. As a result, it was shown that both men and women had significantly higher educational backgrounds in the group containing only the family dentist than in the group containing only the family physician, but there was no significant difference in the annual income (Table 2). At the same time, the subjective health is maintained predominantly for both men and women those that only family dentist compared with only a family doctors, and at the same time, the number of diseases are significantly reduced, and the daily living activity and height are significantly higher. Furthermore, the degree of need for long term care was significantly maintained after 3 years, and also the number of survival days was shown to be longer for women (Table 2).

5. Results of Exploratory Factor Analysis

This analysis was performed by the maximum likelihood procedure and a Promax oblique rotation for analyzing the relational structure of healthy longevity using latent variables. As a result, the first factor is the 「Total Number of Disease」 (「」indicate observed variable) which are the observation variables, and the 「Daily Active Ability」including BADL and IADL among the target population, which is named as the "Three Health Factors" ("" indicate latent variable). Factor 2 was termed "Socio-economic Status" indicated 「Educational Background」 and 「Annual Income」 and 「Height」. Finally, factor 3 was termed "Healthy life" indicated 「Survival days」 and 「Subjective Health」after 3 years. The cumulative contribution proportion of the above five factors was 36.4 per cent. The ChroneBach's Alpha Confidence factor was 0.38, however, socio-economic factors and health longevity confidence factor were small (Table 3).

Table 1: Percentage of family physicians and dentists by age groups and gender

		None of dentist Dentist onlyand Physician		Having both the dentist and Physician	Physician only	Total
Men	65-69	311 18.1%	232 13.5%	881 51.2%	297 17.3%	1721 100.0%
	70-74	116 11.7%	77 7.8%	634 63.8%	166 16.7%	993 100.0%
	75-79	57 10.5%	39 7.2%	349 64.3%	98 18.0%	543 100.0%
	80-84	14 5.5%	23 9.1%	162 63.8%	55 21.7%	254 100.0%
Survival Days		1,042.9(114.2)	1,041.1(114.7)	1,027.0(151.7)	1,028.1(145.0)	
Women	65-69	270 16.4%	124 7.5%	1022 62.1%	230 14.0%	1646 100.0%
	70-74	98 9.7%	54 5.4%	700 69.4%	157 15.6%	1009 100.0%
	75-79	44 6.1%	45 6.2%	485 67.3%	147 20.4%	721 100.0%
	80-84	11 3.2%	18 5.3%	217 64.0%	93 27.4%	339 100.0%
Survival Days		1,054.79(83.9)	1,042.8(117.9)	1,048.2(104.3)	1,036.7(129.2)	
		P<0.036				

Table 2: The relations between the socio-economic factors and living characteristics according to the presence or absence of sentences that only family dentist and those that only physician by seses

	Men			**Women**		
	Physician only	**Dentist only**		**Physician only**	**Dentist only**	
Educational Background						
Graduate from senior high school	322(57.6%)	224(47.9%)		469(84.8%)	273(72.4%)	
Graduate from vocational school	32(5.7%)	19(4.1%)	P<0.01	63(11.4%)	58(15.4%)	P<0.01
Graduate from college	205(36.7%)	225(48.1%)		21(3.8%)	46(12.2%)	
Yearly Income						
<1million yen	4(2.4%)	12(3.6%)		0(0.0%)	2(1.5%)	
1milion-3 milion	35(20.8%)	60(18.2%)		15(23.8%)	25(18.9%)	
3milion-5milion	90(53.6%)	169(51.4%)		37(58.7%)	74(56.1%)	
5milion-9milion	31(18.5%)	74(22.5%)		11(17.5%)	29(22.0%)	
>9million	8(4.8%)	14(4.3%)		0(0.0%)	2(1.5%)	
Subjective Health						
very healthy	63(10.2%)	146(29.4%)		50(8.0%)	250(27.2%)	
almost healthy	409(66.5%)	317(63.8%)	P<0.01	390(62.3%)	605(65.8%)	P<0.01
not so healthy	97(15.8%)	27(5.4%)		129(20.6%)	47(5.1%)	
unhealthy	46(7.5%)	7(1.4%)		57(9.1%)	18(2.0%)	
Total Number of Diseases	0.92(0.82)	0.17(0.48)	P<0.01	0.73(0.77)	0.07(0.28)	P<0.01
Daily living Ability	7.45(1.45)	7.76(0.75)	P<0.01	7.30(1.63)	7.84(0.69)	P<0.01
Survival Days	1,028.1(450.0)	1,042.9(114.2)	P<0.01	1,036.7(129.2)	1,054.7(83.9)	P<0.01
Height(cm)	163.2(6.1)	164.5(7.0)	P<0.01	150.2(7.2)	152.0(4.9)	P<0.01
Bed Ridden Degree						
Bed ridden status	48(7.8%)	48(0.8%)	P<0.01	81(10.4%)	9(2.1%)	P<0.01
Non of bed ridden status	568(92.2%)	494(99.2%)		546(87.1%)	414(97.9%)	

( ) means Standard eviation

Table 3: Results of Exploratory Factor Analysis

	Three Health Factors	Socioeconomic Status	Healthy Longevity
Subjective Health in 2001	0.841	0.085	0.015
Subjective Health in 2004	0.68	0.105	0.242
Total Number of Diseases	0.373	0.037	0.062
Daily Living Ability	0.352	0.053	0.051
Educational Background	0.043	0.739	0.024
Height	0.021	0.47	0.021
Yearly Income	0.096	0.299	0.041
Survival Days	0.136	0.023	0.574
Chronebach α index	0.388	0.151	0.005

5.1. Rerelational Structure of Healthy Longevity

From the hypothetical models that can be assumed using the latent variables obtained by the exploratory factor analysis, the model with the highest goodness of fit was searched for based on the modified index. As a result, we positioned " Healthy Longevity"as a dependent latent variable, and adopted Figure1 model using "Socio-economic Status" and "Three Health Factors" as explanatory latent variables, and including「Bedridden Degree after 3 year」. Goodness-of-fit index NFI was 0.821, IFI was 0.826 and RMSEA was 0.042. In addition, all pass cases between latent variables and observed variables were significantly different in the Wald test. On the other hand, there was no significant difference in the estimates from「Physician and or Dentist」to the "Healthy Longevity". The pass index that showed a direct effect on the「Physician and or Dentist」by the "Socio-economic Status" ranged from 0.07 to 0.061. The direct effects from the "Three Health Factors" on the「Physician and or Dentist」were also similar to 0.09 to 0.17. This model was able to explain 11% of「Physician and or Dentist」. Therefore, it was shown that the group with only a family dentist prefers "Socio-economic Status" and "Three Health Factors" compared with the group with only an internal physician. The relation between「Physician and or Dentist」and "Three Health Factors" are likely to be interrelated because they were investigated at the same time. Therefore, the estimated value from the「Physician and or Dentist」to "Three Health Factors" was 0.25 to 0.27, and was larger than estimated value of 0.09 to 0.17 from "Three Health Factors" to the「Physician and or Dentist」. In other words, the group with only family dentists was shown as a higher「Daily Living Ability」, higher「Subjective Health」, and greater possibility of reducing「Total Number of Diseases」rather than the group with only physician. At the same time, it was shown that if there is a lot of disease and the health level is low, there is a tendency to have a physician rather than a family dentist. However, the estimated value from the three health factors to the「Physician and or Dentist」was 0.09 to 0.17, and the estimated value from the「having the internal physician and or dentist to the "Three Health Factors" was 0.25 to 0.27. There was no significant difference in this ralation foe both sexes (men $Z=1.12$ $P<0.19$, women $Z=1.83$ $P<0.11$). Thus, it was shown that「Physician and or Dentist」to "Three Health Factors" are interrelated. As for "Three Health Factors" , the direct effect from the "Socio-economic Status" was 0.13, and the direct effect from the「Physician and or Dentist」was 0.26, which could explain 18% of the "Three Health Factors".

The direct effect on the "Three Health Factors" from the "Socio-economic Status" was shown to be significantly ($z=2.83$ $P<0.01$) greater for women rather than for men. The direct effect from "Three Health Factors" on "Healthy Longevity" was the largest at 0.60. The next largest was the 「Bedridden Degree after 3 years」 at 0.22. The direct effect from "Socio-economic Status" to "Healthy Longevity" was shown to have the lowest estimate of 0.06. The direct effect from "Three Health Factors" to the 「Bedridden Degree after 3 years」 was 0.49, which was the largest, and the direct effect from the 「Physician and or Dentist」 was 0.10. The 21% of the 「Bedridden Degree after 3 years」 was explained. Although the direct effect from "Socio-economic Status" is extremely small for " Healthy Longevity", the overall effect including the indirect effect on " Healthy Longevity" via "Three Health Factors" and 「Physician and or Dentist」 based on the "Socio-economic Status" is 0.10 to 0.24. The largest overall effect on " Healthy Longevity" is the "Three Health Factors", which ranges from 0.73 to 0.74. The next largest overall effect was the 「Bedridden Degree after 3 years」 indicated 0.22. The overall total effect on "Healthy Longevity" from the 「Physician and or Dentist」 is 0.17 to 0.18 (Table 4). This figure could explain 53% of " Healthy Longevity" (Figure1).

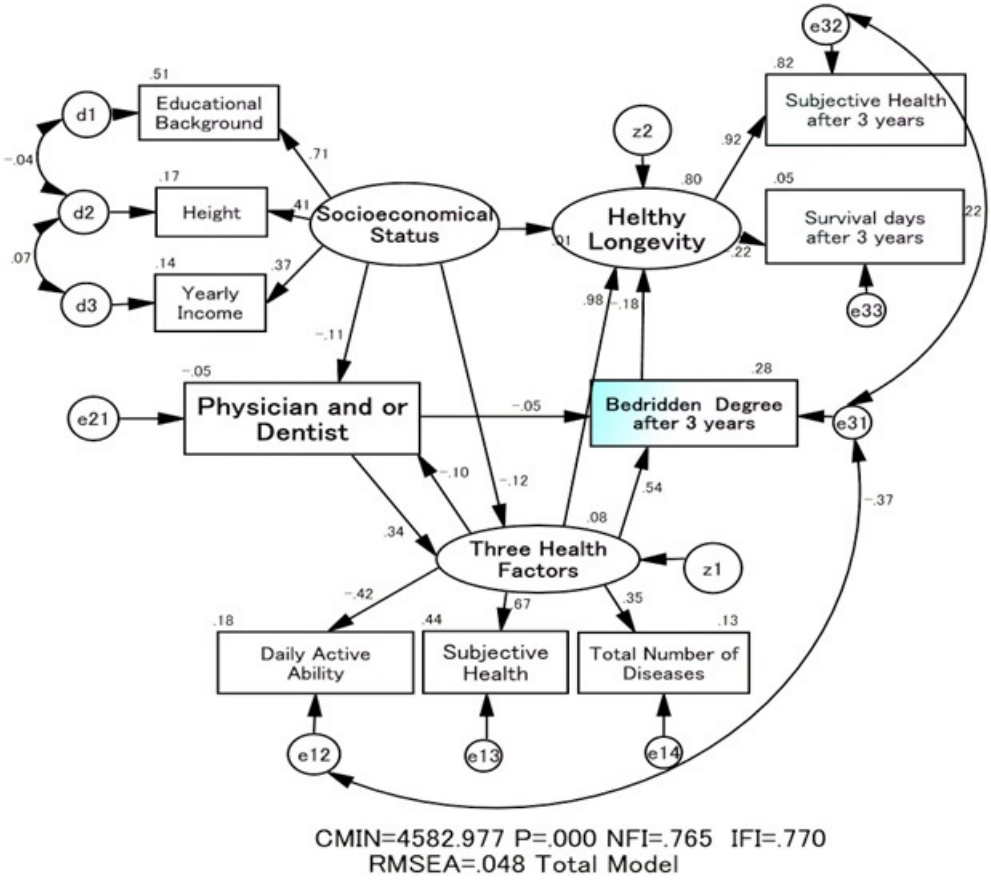

Figure 1: Relational structure of " Healthy Longevity", "Three Health Factors" and 「Physician and or Dentist.

6. Discussion

6. 1. Relational Structure of the Healthy Longevity with a Family Doctor and or a Family Dentist

It has become clear that the direct effects of both "Socio-economic Status" and「Physician and or Dentist」are small but can be positioned as the basis for maintaining a "Three Health Factors" and "healthy longevity". The "Three Health Factors" with the greatest total effect on "Healthy Longevity" were 0.73 to 0.74.

The next largest total effect on "Healthy Longevity" was that「Bedridden Degree after 3 years」after 3 years, and the total effect was 0.22. Table 4 shows the total effect from「Physician and or Dentist」on "Healthy Longevity" were from 0.17 to 0.18 (Table 4). It is considered that the growth of the main organs is completed at the same time as the height increase, which is strongly related to the educational background. At the same time, due to the desirable educational background, it is linked to the reduction of illnesses and the maintenance of daily living ability in the elderly, which is about half a century later, and at the same time, the enhancement of subjective health. As a result, it is linked to the independent selection of only the family dentist who lives without a family physician is likely to lead to the maintenance of survival at the same time. Furthermore, it was suggested that there is a possibility that a relational structure that maintains healthy longevity can be seen via the maintaining the bedridden degree after 3 years. This was the main novelty of this study. The relationship between the「Physician and or Dentist」and the "Three Health Factors" is a cross-sectional survey, and the causal relationship cannot be discussed. Therefore, the mutual relationship was analyzed by pass analyses can be examined. As a result, the「Physician and or Dentist」had an estimated value of 0.17 affected by the "Three Health Factors", and also an estimated value of 0.27 affected by the「Physician and or Dentist」. Therefore, it is presumed that「Physician and or Dentist」may have the effect of reducing the「Total Number of Diseases」, maintaining the「Daily Active Ability」, and enhancing the「Subjective Health」. Thus, it was suggested that「Physician and or Dentist」and "Three Health Factors" are interrelated each other. The group with family dentist was considered together with the results of the previous study[9,10] and the results of this study, in which the cumulative survival rate was maintained thereafter. As a result, the novelty was clarified as a relational structure including related factors that the explanatory power of healthy longevity was much more enhanced including long term care. Therefore, it may not be desirable to interpret that the presence of a family dentist directly preserves the subsequent survival days and cumulative survival rate. Rather, in a group blessed with "Socio-economic Status" that only a family dentist can have, "Three Health Factors" are desirable, and " Healthy Longevity " is maintained as a result of the subsequent intention of「Bedridden Degree after 3 years」as a relational structure. As a new

operational definition, "new healthy longevity" were analyzed by another model including observation variables such as 「Bedridden Degree after 3 years, as well as 「Survival days」 and 「Subjective Health after 3 years」. As a result, a high degree of conformity was obtained, although the degree of conformity was slightly reduced. In this survey, causal factories can only discuss the 「Bedridden Degree after 3 years」 and the effect on "Health y Longevity" after three years. On the other hand, there was a limitation that only relation could discuss because the research range of "Three Health Factors" and "Socio-economic Status" is determined in the same year as that of the 「Physician and or Dentist. The next task is to clarify the causal structure by follow-up surveys with different years of research for all variables.

6. 2. The Relational Factor by the Physician and or Dentist

According to this study, the percentage of elderly people living at home in suburbs who had only a internal physician was 17.2%, and the percentage increased with aging. On the other hand, the ratio of having only a dentist was 12.7%, and the ratio decreased with aging for both sexes. Based on the 2001 patient survey conducted by the Ministry of Health, Labor and Welfare, the consultation status was almost the same as in this survey. Therefore, it is presumed that the results of this survey may reflect the actual situation. However, there are no research reports other than TrungDo [20] in the previous research on the actual situation of family dentists, so this is a topic issue for future research. The Japan Dental Association presented a dental hygiene week, presented the significance of having a family dentist, and proposed various projects for that purpose. Similarly, the Japan Medical Association has presented the roles, and directions to promote family doctors. However, it is a future research subject to clarify the actual situation of doctors including dentists.

6.3. Significance of Having a Physician and a Dentist

The large scaled reviews of a medical treatment researches have shown that physicians reduce the risk of illness and, as a result of the maintaining the survival rate. However, it was shown that the number of survival days was significantly shorter in the group containing only an internal physician than in the group containing only a dentist.

It was necessary to consider that the background to this was that the group with only family physician had a low educational background, low living activity ability, a particularly large number of illnesses, and a lower subjective health. On the other hand, the group with only family dentists was a blessed group with a selective bias that both men and women had excellent socio-economic status. Therefore, it is presumed that excellent oral care may be linked to the maintenance of health as a result of fewer diseases. As health support related to aviation hygiene for examinees by family dentists and dental hygienists, it was considered to be a systematic and comprehensive system of primary prevention, secondary prevention, and tertiary prevention, which showed by Ogden et al [21]. The German researcher Gellrich et al. [22] reported that it should be used for early detection of illness as well as support activities to change behavior to a favorable lifestyle as a role of revenge. Reichart [23] shows that if retaliation contributes to disease prevention, four A (Ask, Advice, Assist, and Arrange) should be utilized and this is the EU Europe's preventive strategy model. Takada et al. [24] conducted a dentist's examination and a dental hygienist's health education for 509 workers under the age of 40 for two years. As a result, when the degree of periodontal disease was evaluated by CPITN (Community Periodental Index Treatment Needs), it was reported that the rate of suspected periodontal disease in men decreased from 43% to 21% in the following year. The Japan Dental Association has created a report with the aim of clarifying the current scientific basis for the contribution of prevention and medical care by dentists toward the realization of a longevity society. The title of this report is Evidence for Dental Health and Oral Health that Contributes to a Healthy and Longevity Society in 2015」 [25]. In this report, a follow-up study was also reported in which the survival of women was maintained especially when the number of remaining tooth, which is one of the desirable oral care effects, was 10 or more. Furthermore, the incidence of aspiration pneumonia was significantly reduced compared to the control group without intervention for institutional residents, and as a result, the mortality rate was also reduced. In this way, based on previous research, the significance of maintaining good health through desirable oral hygiene in the future can be digested as follows. By having a family dentist based on socio-economic factors, the residual index tends to be maintained and preventive activities such as oral care tend to be preferable, and it can be linked to disease prevention through the richness of food. In addition to the screening activities to detect serious illnesses at an early stage with the support of a family physician, it is also an important measure to lead to survival status through effective treatment, illness prevention activities, and reduction of health risk.

6. 4. Future Research Issue

A future research issue is to clarify the causal structure of the healthy longevity by conducting continuous surveys at different times for each latent variable. It is also future research issue to verify the reproduction with representative samples and improve the validity. In addition, the next research subject is to analyze the causal structure of healthy longevity after clarifying the oral hygiene situation judged by the dentist including the residual index while using an objective medical examination. Kobayashi et al [29] Introduced that the Hokkaido University Dental Hospital took the lead in establishing a community support medical department and receiving support requests from family doctors, family dentists, home-visit nursing stations. Watanabe et al [30]. Have set up a cardiovascular center as a regional core hospital,

and report on the need to provide comprehensive and sustainable cooperation from health and welfare to long-term care by providing medical care that is closer to the community while specializing in heart disease. In the future regional alliances pass, it is expected that efforts will be made with the role of a family dentist added.

7. Conclusion

According to this study, elderly people with desirable socio-economic status tend to have only a dentist. At the same time, a related structure was shown in which the degree of care required was maintained together with three health factors, and as a result, and healthy longevity with high level of the subjective health was been maintained. This related structure could explain 54% of healthy longevity. At the same time, a similar tendency was shown by gender. Future research topics will require the use of oral care, and health indicators such as blood pressure and blood glucose levels. It is also expected that the external validity will be enhanced by analyzing the causal structure by intervention studies including a randomized control group.

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