Edelweiss Applied Science and Technology
ISSN: 2576-8484
Vol. 9, No. 5, 1743-1753
2025
Publisher: Learning Gate
DOI: 10.55214/25768484.v9i5.7282

Exploring the educational factors affecting health and food literacies in Korean diabetes care

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Abstract: This research sought to enhance the overall well-being and nutritional practices of individuals with diabetes by pinpointing the determinants that affect their comprehension of health and food information. The data were analyzed using SPSS 26.0. The experienced group received diabetes management instruction, with 11% more men than women. Compared to the non-educated group, individuals who received training were generally younger, had attained higher education levels, and more frequently maintained a partner relationship or exhibited a higher BMI. The experienced group excelled in reading comprehension of nutrition labels and food literacy, while those without such training encountered greater challenges. Educational interventions in diabetes care were positively associated with improvements in food literacy, health literacy, and the application of diverse treatment strategies. The investigation revealed that factors such as age, education level, occupation, prior weight management experience, and exposure to health and nutritional education—as well as the variety of diabetes treatment methods employed—significantly influenced patients' educational experiences. Understanding health literacy was 1.295 times greater for diabetic patients, and understanding food literacy was 1.341 times greater. Implementing education and raising awareness can help diabetic patients manage their disease and prevent complications.

Keywords: *Body mass index (BMI), Diabetes care, Diabetes mellitus, Food literacy, Health literacy.*

1. Introduction

Diabetes Mellitus is an illness which produces blood sugar rises due to poor insulin secretion and function. If high blood sugar is caused by diabetes, chronic problems may arise in many organs like kidneys, senses, nerves, heart and blood vessel. Hence, it is vital to people with diabetes that commonly control their blood sugar by diet, exercise and medication [1]. While the number of individuals with diabetes has increased worldwide, the age at diagnosis has also decreased [2]. According to the Korean Diabetes Fact Sheet published by the Korean Diabetes Association in 2020, one in six (16.7%) Korean grown-ups 30 aged and above had diabetes [3]. If diagnosed by fasting blood sugar alone, one in seven adults (14.5%) aged 30 and over has diabetes [3]. In particular, the prevalence is 3 in 10 (30.1%) of people over 65 years of age [3]. Given the steady annual increase in diabetes cases in Korea, it is imperative to develop targeted health management strategies for affected individuals. Effective diabetes care relies on a harmonious balance of proper exercise and dietary practices. Moreover, accessing reliable information on nutrition and health management is crucial for optimizing daily exercise and dietary habits.

Managing the diet of individuals with diabetes is a crucial element of health management; however, it remains challenging to implement in practice. Over time, evidence-based nutritional guidelines have been developed specifically for diabetic patients. These guidelines indicate that maintaining optimal blood glucose and lipid levels, ensuring proper nutrition and growth, managing pregnancy and breastfeeding, addressing aging issues, preventing complications, and preserving overall health quality are all vital components of diabetes care [1]. The goal of dietary management is to enhance metabolic

History: Received: 14 February 2025; Revised: 25 April 2025; Accepted: 29 April 2025; Published: 17 May 2025
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efficiency in diabetic patients through adjustments in their eating habits and exercise routines [1]. Health literacy is explained to be the capability to achieve, know, and put on health-related data, making it essential to understand diseases that impact self-regulation [4]. Thus, diabetic patients must engage in consistent self-management practices, including proper medication use, regular physical activity, and effective stress management, to avoid complications [5].

Performance metrics like HbA1c are found to be better controlled in correlation with higher levels of self-management [6]. Furthermore, food literacy, a term about food and nutrient consumption that originated from health literacy [7] is used to describe nutrition management about dietary life. The words "food literacy" and "food comprehension," as well as "dietary life ability," are used interchangeably in Korea [8-10]. Low food literacy has been linked to adverse effects on personal health outcomes [11] and studies on the topic have been the subject of intense discussion since 2010.

Thus, the objective of this research was to examine the connections among food and health literacy and diabetic patients' experiences receiving diabetes management education. It also searched for to identify the factors that influenced these experiences to offer fundamental information and policy recommendations for enhancing the nutritional status and general health of diabetic individuals in Korea. The study's particular goals are:

1. Patients with diabetes who had educational experiences were shown to share certain general characteristics.
2. It was determined what level of literacy diabetic patients had based on their educational experiences.
3. Diabetic patients' educational experiences were used to determine the frequency of insulin methods of treatment.
4. The frequency of insulin treatment approaches, literacy level, experience controlling weight, and education all underwent association analysis.
5. It was determined which variables influenced diabetic patients' educational experiences in terms of their food and health literacy.

2. Methodology

2.1. Research Design

Data from the Community Health Survey of 2021 were used in this additional data analysis study. After extracting specimens from the Community Health Survey using a sophisticated sampling strategy, the mean and variance were estimated by taking the weights, stratification factors, and clustering variables into account.

2.2. Research Subjects

In the 2021 Community Health Survey, diabetes was diagnosed in 28,477 (12.4%) of the 229,242 people overall. The individuals who replied in the affirmative when asked if they had ever received instruction on managing their diabetes were categorised as belonging to the experienced group of diabetes education experience, while the non-experienced group was made up of those who did not receive such instruction. 8,678 (30.5%) respondents were classified as experienced, while 19,799 (69.5%) subjects were classified as non-experienced as a consequence of the classification.

This study's approach separated diabetic patients into groups based on their educational experiences and non-educational experiences. Subsequently, a binary logistic regression analysis was achieved utilizing demographic data, literacy metrics, and the rate of various diabetes cure procedures as independent variables. Subsequently, the study sought to verify the impact of belonging to the educational experience group on diabetes management outcomes, as illustrated in [Figure 1].

Edelweiss Applied Science and Technology
ISSN: 2576-8484
Vol. 9, No. 5: 1743-1753, 2025
DOI: 10.55214/25768484.v9i5.7282

2.3. Research Tools

2.3.1. Clinical Features

This study covered the following basic features: body mass index (BMI), age, sex, education level, occupation, marital status, and experience with weight control. The following age groups were identified: 19–44, 45–64, 65–74, and 75 years and above. The degree of education was divided into four categories: completion of primary, junior high school, or senior high school, or university-level education. The categories for occupations included professional, customer service, administrative office, primary industries, as well as basic labour and others. Undersized (less than 18.5 kg/m2), normal weight (18.5–22.9 kg/m2), plus-sized (23.0–24.9 kg/m2), and obese (more than 25.0 kg/m2) were the specified ranges for BMI. The BMI standard, 18.5-22.9 kg/m2, is set by the World Health Organisation.

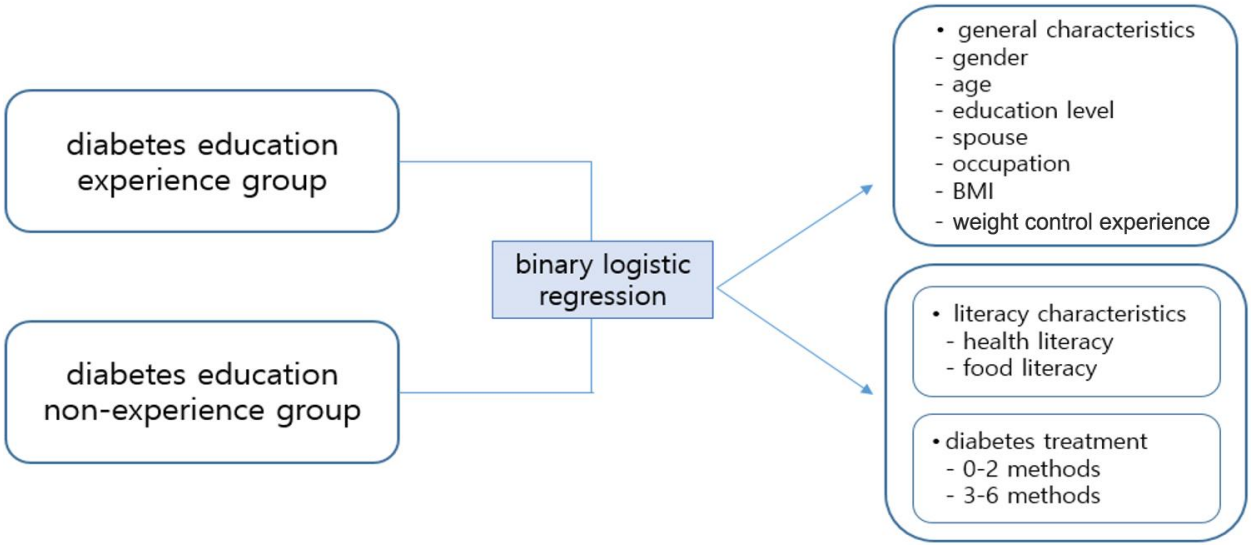

Figure 1.
Diabetes management results.

2.3.2. Literacy Level

The literacy is broken down into two categories: food and health. In terms of health literacy, how challenging is it to comprehend verbal explanations from physicians, nurses, doctors of oriental medicine, and other medical staff? A misunderstanding was categorised as "very difficult," whereas understanding was rated as "somewhat easy" and "very easy." Additionally, participants were asked, “How difficult is it to understand written content from sources such as newspapers, the Internet, or other informational materials?” Responses of “very easy” or “somewhat easy” were classified as demonstrating comprehension, whereas replies of “somewhat tough” or “very difficult,” along with those expressing disinterest in recorded medical information, were categorized as indicating ignorance. Similarly, in the food literacy segment, individuals who could readily understand and read nutrition labels were deemed to have comprehension, while those who struggled were marked as lacking nutritional knowledge. Moreover, the extent of nutrition label usage was divided into two distinct categories: those who used the labels and those who did not.

2.3.3. Diabetes Mellitus Managements

The inquiry on diabetes, "Are you currently getting medical care for blood sugar control?" is segmented into four categories: insulin injections, medication, non-drug treatment, and the frequency of HbA1c testing. Additionally, participants were asked whether they had ever undergone a fundoscopy to

Edelweiss Applied Science and Technology
ISSN: 2576-8484
Vol. 9, No. 5: 1743-1753, 2025
DOI: 10.55214/25768484.v9i5.7282

assess for diabetic eye complications and a microalbuminuria screening for diabetic kidney complications, with each question receiving a simple 'Yes' or 'No' response.

2.4. Ethical Considerations

All data employed were obtained under strict ethical protocols. Prior to accessing the public health assessment records from Korea Centers for Disease Control and Prevention site, written oath affirming proper data use was submitted, accompanied by a detailed data use strategy. The formal data request procedure was completed, and agreement was secured (receipt number 75712), thereby ensuring full adherence to institutional and national ethical standards.

2.5. Data Analysis

The SPSS 26.0 software were utilised analysing the data collected in this investigation. Tests of the statistical importance on the overall features, literacy level, and diabetes therapy were conducted based on the educational background of patients with diabetes using cross-analysis, correlation analysis, and logistic regression analysis.

3. Comparative Study of Independent Variables Based on Educational Practice

3.1. Comparative Study of General Features by Educational Practice

Table 1 presents the cross-analysis of the features of diabetic patients based on their educational experiences. Among 28,477 subjects, 8,678 (30.5%) are categorized as the experienced group, while the remaining 19,799 (69.5%) are placed in the non-experienced group. Within the experienced group, there are 4,816 men (55.5%) and 3,862 women (44.5%). Regarding age, majority of participants in the experienced group (3,789 or 43.7%) were between 45 and 65 years old, whereas most individuals in the non-experienced group (6,618 or 33.4%) fell within the 65–74 age range. In terms of education, 2,830 subjects (32.6%) in the experienced group were junior high school graduates, trailed by 2,422 (27.9%) per a university grade or advanced, while in the non-experienced group, 8,847 subjects (44.8%) have completed only a fundamental school education. Concerning professions, both groups showed similar trends, with 1,677 (19.3%) in the experienced group and 4,046 (20.4%) in the non-experienced group engaged in basic labor. When examining marital status, 6,123 subjects (70.6%) in the experienced group reported having a spouse, compared to 12,674 subjects (64.0%) in the non-experienced group. Looking at body mass index (BMI), obesity was predominant in both groups, affecting 3,590 (42.9%) individuals in the experienced group and 7,206 (38.9%) in the non-experienced group. In terms of weight control experiences, 5,540 subjects (63.8%) in the experienced group had engaged in weight management practices, while 10,278 subjects (51.9%) in the non-experienced group reported similar efforts. All of these general features exhibited statistically significant differences ($p < 0.001$).

Edelweiss Applied Science and Technology
ISSN: 2576-8484
Vol. 9, No. 5: 1743-1753, 2025
DOI: 10.55214/25768484.v9i5.7282

Table 1.
Comparative Analysis of General Characteristics by Educational Practice.

Features	DM education practice		Overall n=28,477 (%)	$X^2(p)$
	Yes n=8,678(%)	No n=19,799 (%)		
Gender				
Male	4, 816 (55.5)	9,469 (47.8)	14,285 (50.2)	142.016 ***
Female	3, 862 (44.5)	10,330 (52.2)	14,192(49.8)	
Age				
19 to 44 years	667 (7.7)	528 (2.7)	1,195 (4.2)	1008.363 ***
45 to 65 years	3, 789 (43.7)	6, 261 (31.6)	10, 050 (35.3)	
65 to 74 years	2,563(29.5)	6,618(33.4)	9,181(32.2)	
≥ 75 years	1,659(19.1)	6392(32.3)	8,051(28.3)	
Educational Attainment				
≤ primary	2, 066 (23.8)	8, 867 (44.8)	10, 933 (38.4)	1652.420 ***
Junior high	1, 353 (15.6)	3, 493 (17.7)	4, 846 (17.0)	
senior high	2, 830 (32.6)	4, 921 (24.9)	7, 751 (27.2)	
> College graduate	2,422(27.9)	2,504(12.7)	4,926(17.3)	
Profession				
Certified management	1, 211 (14.0)	1, 147 (5.8)	2, 358 (8.3)	686.387 ***
Customer Support	902 (10.4)	1, 583 (8.0)	2, 485 (8.7)	
Primary Industries	821 (9.5)	2, 969 (15.0)	3, 790 (13.3)	
Basic labor	1, 677 (19.3)	4, 046 (20.4)	5, 723 (20.1)	
Alternative	4, 067 (46.9)	10, 054 (50.8)	14, 121 (49.6)	
Spouse				
Yes	6, 123 (70.6)	12, 674 (64.0)	18, 797 (66.0)	114.612 ***
No	2, 553 (29.4)	7, 115 (36.0)	9, 668 (34.0)	
BMI				
Undersized	165 (2.0)	504 (2.7)	669 (2.5)	52.885 ***
Standard weight	2, 500 (29.9)	6, 100 (32.9)	8, 600 (32.0)	
plus-sized	2, 112 (25.2)	4, 712 (25.4)	6, 824 (25.4)	
obese	3, 590 (42.9)	7, 206 (38.9)	10, 796 (40.2)	
Weight control experience				
Yes	5, 540 (63.80	9, 521 (48.1)	15, 061 (52.9)	600.777 ***
No	3, 139 (36.2)	10, 278 (51.9)	13, 416 (47.1)	

Note: *p<.05, **p<.01, ***p<.001.

3.2. Comparative Evaluation of Literacy Levels across Educational Experience Groups

Table 2 presents the comparative analysis of literacy among diabetic patients based on their educational experiences. The literacy measures were separated into two categories: health literacy and food literacy. About health literacy, the majority on participants in both the experienced and non-experienced groups were able to comprehend the explanations provided by medical staff, with 6,649 (76.6%) and 13,362 (67.5%) respondents, correspondingly. Regarding written evidence from correspondents, the Internet, and other informational resources, utmost subjects in the experienced group (5,537; 63.8%) and in the non-experienced group (8,913; 45.1%) demonstrated adequate comprehension.

For food literacy, a majority of participants in an experienced group showed understanding (4,441; 51.3%), whereas respondents in a non-experienced group did not (12,485; 63.2%). With respect to

Edelweiss Applied Science and Technology
ISSN: 2576-8484
Vol. 9, No. 5: 1743-1753, 2025
DOI: 10.55214/25768484.v9i5.7282

reading nutrition labels, individuals in experienced group displayed comprehension (2,081; 46.9%), while a significant portion in non-experienced group required it (4,802; 66.2%). Additionally, when evaluating utilization of nutrition labels, a high percentage of subjects in both groups reported using them—1,722 (82.8%) in the experienced group and 1,960 (79.8%) in the non-experienced group. All observed a difference in literacy levels between the experienced and non-experienced groups was significant ($p < 0.001$ and $p < 0.05$, correspondingly).

Table 2.
Comparative Analysis of Literacy Levels by Educational Practice.

Health and Food Literacy	DM Education Practice		Total n=28,477(%)	$X^2(p)$
	Yes	No		
Understanding of the doctor's explanation				
Understanding	6, 649 (76.6)	13, 362 (67.5)	20, 011 (70.3)	239.121 ***
Misunderstanding	2, 027 (23.4)	6, 422 (32.5)	8, 449 (29.7)	
Degree of understanding of textual data				
Understanding	5, 537 (63.8)	8, 913 (45.1)	14, 450 (50.8)	1036.675 ***
Misunderstanding	1, 947 (22.4)	5, 089 (25.7)	7, 036 (24.7)	
Uninterested	1, 190 (13.7)	5, 781 (29.2)	6, 971 (24.5)	
Reading nutrition facts				
Yes	4, 441 (51.3)	7, 258 (36.8)	11, 699 (41.2)	523.867 ***
No	4, 219 (48.7)	12, 485 (63.2)	16, 704 (58.8)	
Nutrition label reading				
Yes	2, 081 (46.9)	2, 456 (33.8)	4, 537 (38.8)	196.736 ***
No	2, 360 (53.1)	4, 802 (66.2)	7, 162 (61.2)	
Utilize nutrition labeling				
Yes	1, 722 (82.8)	1, 960 (79.8)	3682 (81.2)	6.423*
No	358 (17.2)	495 (20.2)	853 (18.8)	

Note: *p<.05, **p<.01, ***p<.001.

3.3. Comparative Analysis of Diabetes Management Methods by Educational Practice

Table 3 presents a comparative study of the rate of diabetes cure procedures among diabetic patients grouped by their educational experience. The analysis encompassed six distinct diabetes treatment methods, all of which revealed statistically significant differences ($p < 0.001$). For non-drug interventions, the most common response in both groups was the lack of treatment, with 4,800 subjects (55.3%) in the experienced group and 14,881 subjects (75.2%) in the non-experienced group reporting no non-drug treatments. In contrast, a majority of participants in both groups received drug treatments, with 7,726 individuals (89.0%) in the experienced group and 18,221 (92.0%) in the non-experienced group undergoing medication therapy. Similarly, for insulin injection treatments, the absence of such treatment was most prevalent, observed in 7,575 subjects (87.3%) in the experienced group and 18,865 subjects (95.3%) in the non-experienced group.

Regarding fundoscopy, the majority of patients in the experienced group underwent the examination (4,588, or 52.9%), whereas most patients in the non-experienced group did not have the examination, with 13,130 (66.5%) falling into that category. Furthermore, when examining microalbuminuria tests, a substantial proportion of subjects in both groups were tested, with 6,831 (78.7%) in the experienced group and 11,975 (60.5%) in the non-experienced group having undergone the test.

Edelweiss Applied Science and Technology
ISSN: 2576-8484
Vol. 9, No. 5: 1743-1753, 2025
DOI: 10.55214/25768484.v9i5.7282

Table 3.
Comparative Analysis of Diabetes Treatment Methods by Educational Practice.

Characteristics	DM education practice		Total n = 28,477 (%)	X^2 (*p*)
	Yes	No		
Non-drug treatment				
Yes	3,878(44.7)	4,918(24.8)	8,796(30.9)	1113.427***
No	4,800(55.3)	14,881(75.2)	19,681(69.1)	
Drug handling				
Yes	7,726(89.0)	18,221(92.0)	25,947(91.1)	67.087***
No	952(11.0)	1,578(8.0)	2,530(8.9)	
Insulin handling				
Yes	1,103(12.7)	934(4.7)	2,037(7.2)	580.380***
No	7,575(87.3)	18,865(95.3)	26,440(92.8)	
Fundoscopy				
Yes	4,588(52.9)	6,605(33.5)	11,193(39.4)	951.775***
No	4,087(47.1)	13,130(66.5)	17,217(60.6)	
Microalbuminuria				
Yes	5,246(60.5)	7,764(39.4)	13,010(45.8)	1084.162***
No	3,420(39.5)	11,947(60.6)	15,367(54.2)	
HbA1c				
Yes	6,831(78.7)	11,975(60.5)	18,806(66.0)	894.389***
No	1,847(21.3)	7,824(39.5)	9,671(34.0)	

Note: *p<0.05, **p<0.01, ***p<0.001.

4. Correlation Analysis of Variables by Educational Practice

Table 4 displays the relationship study among various variables based on the educational experiences of diabetic patients. The relationships examined include diabetes management education practice, weight control practice, health literacy, food literacy, and diabetes treatment methods—totally of which proved statistically significant ($p < 0.001$). Diabetes education experience demonstrated a positive correlation with diabetes treatment methods ($r = .292$, $p < 0.001$), health literacy ($r = .194$, $p < 0.001$), and food literacy ($r = .162$, $p < 0.001$), while it was negatively associated with weight control experience ($r = -.145$, $p < 0.001$). In addition, weight control experience was inversely related to food literacy ($r = -.231$, $p < 0.001$), health literacy ($r = -.225$, $p < 0.001$), and diabetes usage procedures ($r = -.163$, $p < 0.001$). Additionally, health literacy was significantly associated by both food literacy ($r = .301$, $p < 0.001$) and diabetes treatment method ($r = .190$, $p < 0.001$). Moreover, food literacy also showed a positive correlation with diabetes treatment methods ($r = .170$, $p < 0.001$).

Table 4.
Correlation Analysis of Variables by Educational Practice.

Variables	1	2	3	4	5
1. Participation in Diabetes Education	1				
2. Exposure to Weight Control Practices	-0.145 ***	1			
3. Health literacy	0.194 ***	-0.225 ***	1		
4. Food literacy	0.162 ***	-0.231 ***	0.301 ***	1	
5. Diabetes treatment	0.292 ***	-0.163 **	0.190 ***	0.170 ***	1

Note: *p<.05, **p<.01, ***p<.001.

Edelweiss Applied Science and Technology
ISSN: 2576-8484
Vol. 9, No. 5: 1743-1753, 2025
DOI: 10.55214/25768484.v9i5.7282

5. Determinants of Diabetes Management Educational Experience

Table 5 displays the outcomes of a binary logistic reversion analysis conducted and determine the reasons affecting the experiences of diabetic patients.

A hierarchical regression analysis were carried out, and in Model 1, several general features—including age, learning level, marital status; profession, and mass control experience—was established and have a significant impact ($p < 0.001$, $p < 0.01$). Specifically, in comparison to diabetic subjects aged 19 to 44 years, those aged 45–65, 65–74, and 75 years or older had educational experiences that were 0.661, 0.582, and 0.473 times, respectively, as high. In terms of educational attainment, relative to subjects with only a primary school education, those who graduated from junior high school, senior high school, and college or higher experienced 1.403, 1.872, and 2.708 times higher levels of educational exposure, respectively. Moreover, diabetic patients with a spouse exhibited an educational experience that was 1.102 times greater than that of those without a spouse. When comparing occupational categories, subjects in professional and administrative roles had educational experiences 1.170 times higher than those classified as "other," while those employed in primary industries, as well as those engaged in basic labor, showed factors of 0.697 and 0.821 times, respectively. Additionally, subjects with previous weight control experience demonstrated educational outcomes 1.432 times higher than those without any weight management history.

In Model 2 of the hierarchical regression, age, education level, profession, and weight control practice continued significant ($p < 0.001$, $p < 0.05$). Beyond these factors, the analysis also revealed that health literacy, food literacy, and the number of diabetes treatment methods employed significantly influenced educational experience ($p < 0.001$). In particular, diabetic individuals who exhibited an understanding of health literacy had educational experiences that were 1.295 times higher than those who did not. Likewise, those who demonstrated knowledge in food literacy experienced 1.341 times greater exposure compared to their counterparts with limited food literacy. Finally, patients utilizing between three and six diabetes treatment methods had educational experiences that were 2.576 times higher than those employing only zero to two methods.

Table 5.
Hierarchical Analysis of Using Factors by Educational Practice.

Classification		Model 1		Model 2	
		OR	CI 95%	OR	CI 95%
Gender					
	Male	ref			
	Female	1.020	0.960 - 1.083	0.959	0.901 to 1.021
Age					
	19 to 44 year	ref			
	45 to 65 year	0.661***	0.581 - .751	0.590***	0.517 to 0.673
	65 to 74 year	0.582***	0.508 - 0.668	0.523***	0.454 to 0.602
	≥ 75 year	0.473***	0.409 - 0.546	0.475***	0.409 to 0.551
Education level					
	≤ primary school	ref			
	Junior high school.	1.403***	1.289 - 1.528	1.212***	1.110 to 1.323
	Senior high school	1.872***	1.730 - 2.027	1.509***	1.389 to 1.640
	> College graduate	2.708***	2.463 - 2.977	1.994***	1.803 to 2.206
Spouse					
	No	ref			
	Yes	1.102**	1.037 - 1.171	1.047	0.983 to 1.115
Profession					

Edelweiss Applied Science and Technology
ISSN: 2576-8484
Vol. 9, No. 5: 1743-1753, 2025
DOI: 10.55214/25768484.v9i5.7282

	Alternative	ref			
	Certified management office	1.170**	1.053 - 1.299	1.148*	1.031 to 1.278
	Customer Service	0.924	0.838 - 1.019	0.934	0.844 to 1.032
	Primary Industries	0.697***	0.635 - 0.764	0.739***	0.672 to 0.812
	Basic Manual Labor	0.821***	0.762 - 0.885	0.855***	0.792 to 0.924
BMI					
	Low Body Weight	ref			
	Normal weight	1.039	0.860 - 1.254	0.978	0.806 to 1.187
	plus-sized t	1.035	0.855 - 1.251	0.982	0.808 to 1.194
	Obese	0.997	0.826 - 1.204	0.969	0.799 to 1.175
Weight control					
experience	No	ref			
	Yes	1.432***	1.351 - 1.517	1.288***	1.214 to 1.368
Health literacy					
	Inadequate understanding			ref	
	Understanding			1.295***	1.220 to 1.376
Food literacy					
	Inadequate understanding			ref	
	Understanding			1.341***	1.245 to 1.444
Diabetes					
treatment	0 to 2 techniques			ref	
	3 to 6 techniques			2.576***	2.428 to 2.733

Note: *p<0.05, **p<0.01, ***p<0.001.

6. Discussions

By determining the elements on health and food literacy based on diabetes supervision training and involvement, this research serves as a foundation for refining the nutritional standing and the total health of diabetic patients. The record from the Korea Centres for Disease Control and Prevention Community Health Survey was used in this investigation. Data and policy recommendations were gathered to enhance diabetes management education.

There were 11% more men than women in experienced group, and then the non-experienced group, the members in experienced group was younger, more educated, more often married, and had higher BMI values. It was established that after learning about their increased risk of developing the condition, diabetes people took an active approach to managing their health.

While the inexperienced group did not test, the experienced group underwent a significant number of health inspections. Given that fundoscopy is linked to the development of retinal problems one of the three main issues associated with diabetes knowing one's risk for the disease appears to enhance the teaching process. It is specifically known that younger people with type 2 diabetes are much more possible than older people to experience microvascular and macrovascular problems, as well as a worsening of the condition and cardiovascular disease morbidity and mortality rise dramatically [12, 13].

Consequently, social support for younger people has a critical role in enhancing diabetes education and care, which in turn impacts the prognosis and longevity of those with diabetes [14, 15]. Furthermore, medication adherence as well as diet management and maintenance are positively impacted by social support [16]. As a result, diabetes patients' inability to manage their condition alone may be severely impacted by an absence of social support [17]. For persons over 40 with possibility factors for type 2 diabetes, annual screening for diabetes is advised [18]. Mothers with gestational

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DOI: 10.55214/25768484.v9i5.7282

diabetes and obesity are at bigger possibility for the diabetes [19]. This case was associated with signs and disorders associated with insulin resistance, as well as a family record of diabetes type 2 [19].

When it came to food literacy, the non-experienced group required comprehension, while the experienced group demonstrated a high level of understanding in this area. A stable diet rich in fruits, vegetables, whole grains, low-fat dairy products, and other nutrients was the foundation of clinical nutrition therapy for individuals with pre-diabetes or diabetes, helping them to achieve their desired blood sugar levels. For more assistance with glucose control, utilise glycemic load [1]. Food literacy education is therefore essential to the management of diabetes and provides a chance to improve food literacy through reading product labels and the verification of nutritional factors. Following a diagnosis of diabetes, it is also essential to take part in lifestyle modifications, medication-assisted weight loss, education about improving diet, stabilising blood sugar levels, and regularly assessing and managing any coexisting conditions and complications.

Patients with diabetes had varying educational experiences depending on their age, education level, career, experience controlling their weight, health and food literacy, and managing their diabetes strategies. Diabetes patients with knowledge of health literacy had an educational experience 1.295 times greater than those with no knowledge of health literacy. Diabetes patients with knowledge of food literacy had an educational experience that is 1.341 times greater than that of diabetic patients without such knowledge. Patients with diabetes who used three to six different diabetes treatment techniques had 2.576 times more educational experience than those who used only two diabetes treatment methods. Health literacy is influenced by both internal and external factors, including ecological factors relating to schooling and learning prospects and cognitive capacity, cognitive decline with age, and knowledge level [20]. Due to their lack of awareness of symptoms and indicators of illness, individuals who have a lack of health literacy may not be able to prevent disease or utilise essential medical treatments [21]. Analysing the nutritional information on food labels prevents patients with limited food literacy from comprehending the connections between nutrition and food, which further impedes appropriate food intake. Active diabetes management will therefore be fueled by obtaining knowledge and recognising health and food literacy.

7. Conclusion

This research examined the features and literacy levels of diabetic patients. It's suggested strategy for health improvement. As a result, the findings support the following recommendations. First, society should foster preventive care and enhance awareness of health and nutrition before diabetes is even diagnosed. Second, universal screening should be made available for individuals in the 45–64 age groups, which exhibits the highest prevalence of diabetes. Third, targeted health education, nutrition awareness, and health promotion initiatives should be focused on diabetic individuals to prevent secondary complications and slow disease progression. Fourth, South Korea should adopt this framework by promoting literacy in chronic diseases like diabetes and expanding the availability of digital therapy options. It is imperative to know that the study's findings are restricted by the exclusive use of national raw data, which may not capture all dynamic changes associated with diabetes. Given the complex and diverse nature of diabetes-related factors, caution should be exercised when generalizing these results. Future research should incorporate a broader set of variables for a more comprehensive analysis.

Transparency:

The author confirms that the manuscript is an honest, accurate, and transparent account of the study; that no vital features of the study have been omitted; and that any discrepancies from the study as planned have been explained. This study followed all ethical practices during writing.

Edelweiss Applied Science and Technology
ISSN: 2576-8484
Vol. 9, No. 5: 1743-1753, 2025
DOI: 10.55214/25768484.v9i5.7282

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Edelweiss Applied Science and Technology
ISSN: 2576-8484
Vol. 9, No. 5: 1743-1753, 2025
DOI: 10.55214/25768484.v9i5.7282