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Relationship between Career Anchors and Demographic Characteristics among Occupational Health Nurses in Japan

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Abstract

Objectives: This study examined the relationship between career anchors and demographic characteristics among occupational health nurses in Japan. Methods: Seven-hundred forty-five occupational health nurses participated in the questionnaire survey. Measurements included demographic data and the Career Anchors: Self-Assessment Scale. Results: We found the following career anchor scores: Technical/functional Competence=13.7, Lifestyle=13.3, Pure Challenge=12.7, Service/dedication to a Cause =12.7, Autonomy/ independence= 12.3, Security/stability = 12.2, Entrepreneurial/creativity = 10.0, and General Managerial Competence = 9.0. Occupational health nurses from graduate school had the highest score in seven career anchors (excluding Security/stability); occupational health nurses from vocational school had the lowest score in six career anchors (excluding Autonomy/independence and Entrepreneurial/creativity). Occupational health nurses with public health nurse qualifications had the highest score in six career anchors (excluding Service/dedication to a Cause). There were no significant differences between marriage, child-care experience, and family-care experience and Lifestyle type.

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Occupational health nurses aged in their 20s had the highest score in six career anchors (excluding Lifestyle). Occupational health nurses who worked full-time had the highest score in six career anchors (excluding Pure Challenge).

Keywords: Career anchor, Career development, Occupational health nurse

1 Introduction

The Japanese Nursing Association (JNA) stated the importance of designing career plans and goals according to the ability, life, and life cycles of each nurse, and the needs of society regarding the career development of nursing staff. Furthermore, the JNA states that each nurse must work hard to achieve his or her own goals. Moreover, for nurses to continue to learn and maintain and develop their abilities, they require educational support, which must be provided by the organization [1].

In the 2010 fiscal year in Japan, the Act on Public Health Nurses, Midwives, and Nurses and the Act on Assurance of Work Forces of Nurses and Other Medical Experts were revised, and more effort on workplace education became an obligation [2]. However, under these policies, the person in charge of workplace education was the hospital director; consequently, the revisions centered on hospitals. Therefore, companies and health insurance associations that employ occupational health nurses (OHNs) were not obligated to provide workplace education and career support systems.

The career development of OHNs has faced many challenges [3, 4]. In Japan, employers who employ over 50 workers must hire at least one certified occupational health physician (OHP) and an occupational safety and health manager, which is stated in the Occupational Health and Safety Law. In accordance with this law, OHNs do not need to be hired and the roles of OHNs are unclear [5]. However, according to the JNA [6], the number of OHNs in Japan has increased; there were approximately 8800 OHNs in 1995, which has increased to approximately 12300 in 2012. The Occupational Health Nursing Research Center indicated that, while about 70% of OHNs have both registered nurse (RN) and public health nurse (PHN) qualifications, the other 30% have only a RN qualification. OHNs with only RN qualifications were intermingled; some OHNs had an RN qualification and were educated by the Japan Society for Occupational Health, whereas others had not received an RN qualification. OHNs with a PHN qualification are educated in not only personal support (e.g., health

consultations and reinstatement support), but also public health (e.g., group education and population health approaches). The undergraduate education for OHNs in Japan differs significantly among nursing universities. Consequently, significant differences exist in the qualifications and undergraduate education of OHNs [3].

Furthermore, about 30% of OHNs work alone, without OHPs and colleague OHNs, thereby limiting opportunities for on-the-job training and role expansion. Many OHNs work full-time, whereas most OHPs work part-time. About 50% of OHNs are supervised by non-healthcare staff, who may not fully understand the OHN role and may not value continuing professional development and the importance of being promoted and hired as full-time staff [3]. Therefore, OHNs in Japan may find it difficult to plan and develop their careers [3, 4].

Previous studies have examined three areas: organization and professional orientations [7], generalist and specialist orientations [8], and diverse orientations that capture professional life, including the individual's personal life [9]. Schein defined a career anchor as a person's self-concept consisting of aspects pertaining to the career such as self-perceived talents, values, and an evolved sense of motives [9]. A career anchor reflects the direction that a worker wants to go [10]. Reflection on career anchors and career development management is essential to researching OHNs [11]. To develop the careers of healthcare workers, career anchors lead to the acquisition of competency, knowledge, and the improvement of techniques [12].

Therefore, this study focused on career anchors as a principal factor in career development. Previous studies on career orientations in nursing have focused on administrative public health nurses (APHNs) [13, 14] and hospital nurses (HNs) [15–17]; there are no studies on OHNs. Consequently, this study examined the relationship between career anchors and demographic characteristics among OHNs in Japan. In this paper, careers were related to attitudes and actions developed through objective aspects such as job title, status, and employment history, but also through the processes of employment-related experience and activities. Consequently, careers were defined as life-long self-realizations, and career anchoring, which incorporates individual lifestyles, was a vital component of occupational health nursing. OHNs were defined as those practicing occupational health nursing services in a corporation, health insurance association, industrial health organization, or as self-employed business owners.

2 Materials and Methods

Participants

We recruited OHNs affiliated with the Japan Society for Occupational Health. First, half the sample were selected through random sampling by the secretariat of the Japan Society for Occupational Health. Those not currently working as OHNs were excluded. Finally, 745 anonymous questionnaires were mailed in May 2015 with a letter describing the aims and procedure of the study, and assuring potential participants that participation was completely anonymous. Three-hundred thirty-seven questionnaires were returned (response rate = 45.2%). After excluding OHNs with at least one missing data point on the Career Anchors: Self-Assessment Scale (CASAS), 325 questionnaires were included in the analyses.

Demographic information

Demographic data included sex, age, years as an OHN, education level, qualification, position, affiliation, employment, supervisor, marital status, child-care experience, and family-care experience.

CASAS

The CASAS is a 40-item measure for general workers developed by Schein [9]; the Japanese version of the CASAS was translated by Kanai [18]. The CASAS comprises eight subscales: Technical/functional Competence (TF), General Managerial Competence (GM), Autonomy/independence (AU), Security/stability (SE), Entrepreneurial/creativity (EC), Service/dedication to a Cause (SV), Pure Challenge (CH), and Lifestyle (LS). Response options were: 1 ("*never true*"), 2 ("*sometimes true*"), 3 ("*mostly true*"), and 4 ("*always true"*) (range = 1–4).

Statistical analyses

The data of 325 participants were scored for each subscale of the CASAS via a Likert scale score. The scores of each subscale with the highest score defined the career anchor type. Therefore, the strongest career anchor types were investigated for each subscale. Furthermore, characteristics and subscale scores were calculated to analyze the relationship between characteristics and subscale scores. For two groups, such as national qualification and qualification, a non-paired t-test was conducted. For more than three groups, such as age and supervisor, a one-way analysis of variance (ANOVA) and a hypostasis Bonferroni test were

conducted.

Multiple regression analyses were used to assess the relationship between career anchor and demographic characteristics. First, each independent variable was calculated as a candidate correlation coefficient via the Spearman method; therefore, the correlation coefficient of age (real number) and years as an OHN (real number) was 0.5 or more ($r = 0.719$). Consequently, "years as an OHN" was left as an independent variable because correlation coefficients were higher with career anchor scores. Moreover, the nominal scale was converted into dummy variables of 0 and 1, and a scale with three or more categories was created as a reference category, such as national qualification (1: public health nurse, 0: registered nurse) and qualification (1: yes, 0: no).

Stepwise method multiple regression analyses were used to assess the relationship between each career anchor scores as the dependent variables, as well as the independent variables of years as an OHN, dummy variables of nominal scale national qualification and qualification, and so on. Because we calculated the variance inflation factor value at the time of analysis, the value was always around 1 to 2 levels, as there were no variables that were more than 10; in other words, there were no problems regarding multiple collinearity. All statistical analyses were conducted using SPSS Version 23.0 for Windows (IBM Corp., NY, USA).

Ethical considerations

This study was approved by the ethical review board of the author's institution (ID number 7823). This study was approved by the Japan Society for Occupational Health. Participants were informed of the purpose, procedures, potential publication of this study, and their rights of refusal and confidentiality. Written informed consent was obtained from participants.

3 Results

Participants' characteristics

Table 1 shows participants' characteristics. The mean age of participants was 45.3 years (SD = 9.3). The mean length of career as an OHN was 15.3 years (SD = 9.1).

Table 1: Demographic characteristics and work environment (N=325)

		N	(%)
Sex			
	Female	322	(99.1)
	Male	3	(0.9)
Age (yr)			
	≤29	14	(4.3)
	30–39	84	(25.8)
	40–49	107	(32.9)
	50–59	104	(32.0)
	≥60	15	(4.6)
	No response	1	(0.3)
Career as an occupational health nurse (yr)			
	≤5	44	(13.5)
	6–10	92	(28.3)
	11–20	99	(30.5)
	21–30	70	(21.5)
	≥31	20	(6.2)
Educational level			
	Vocational school	134	(41.2)
	Nursing junior college	58	(17.8)
	University	100	(30.8)
	Graduate school	29	(8.9)
	Other	4	(1.2)
Qualification			
	Public health nurse	241	(74.2)
	Midwife	7	(2.2)
	Registered nurse	304	(93.5)
	Registered occupational health nurse of the society[1)]	196	(60.3)
	Occupational health consultant	7	(2.2)
Position			
	Nurse manager	38	(11.7)
	Staff nurse	257	(79.1)
	Other	24	(7.4)
	No response	6	(1.8)
Affiliation			
	Corporation	238	(73.2)
	Health insurance association	35	(10.8)
	Public office	5	(1.5)
	Industrial health organization	9	(2.8)
	Health check organization	7	(2.2)
	Hospital	13	(4.0)
	Educational organization	9	(2.8)
	Other	4	(1.2)
	No response	5	(1.5)
Employment			
	Full-time worker	253	(77.8)
	Contract worker	43	(13.2)
	Part-time worker	10	(2.5)
	Other	19	(5.8)
Supervisor			
	Occupational health nurse	56	(17.2)
	Occupational health physician	53	(16.3)
	Others	210	(64.6)
	No response	6	(1.8)
Marriage			
	Yes	234	(72.0)
	No	81	(24.9)
	Other	10	(3.1)
Child-care experience			
	Yes	169	(52.0)
	No	98	(30.2)
	Other	58	(17.8)
Family-care experience			
	Yes	55	(16.9)
	No	212	(65.2)
	Other	58	(17.8)

[1)]Previous education system

Relationship between career anchor scores and demographic characteristics

Table 2 shows the relationship between career anchor scores and demographics. Regarding career anchor scores, TF = 13.7 (SD = 2.7), LS = 13.3 (SD = 2.6), CH = 12.7 (SD = 2.8), SV = 12.7 (SD = 2.9), AU = 12.3 (SD = 2.7), SE = 12.2 (SD = 2.4), EC = 10.0 (SD = 2.9), and GM = 9.0 (SD = 2.6).

There was no significant difference regarding age; OHNs aged in their 20s had the highest score in six career anchors (excluding LS). The one-way ANOVA revealed significant differences in TF and CH types per educational level. There was no significant difference in TF type per the Bonferroni test. There was a significant difference in CH type between vocational school and graduate school per the Bonferroni test. OHNs from graduate school had the highest score in seven career anchors (excluding SE); OHNs from vocational school had the lowest score in six career anchors (excluding AU and EC). There were significant differences in GM, EC, SV, CH, and LS types regarding national qualification. OHNs with PHN qualifications had the highest score in six career anchors (excluding SV). There were significant differences in TF and GM types regarding qualification. There were significant differences in GM types regarding position. Nurse managers had the highest score in six career anchors (excluding SE and LS). There were significant differences in GM types regarding employment. OHNs who worked full-time had the highest score in six career anchors (excluding CH). There was no significant difference between marriage, child-care experience, and family-care experience and LS type.

Table 2: Relationship between career anchors and demographics characteristics (N=325)

		Technical/functional Competence (TF)			General Managerial Competence (GM)		
	N	Mean	SD	*p*	Mean	SD	*p*
Overall	325	13.7	2.7		9.0	2.6	
Age(yr) [B)]							
≦29	14	14.4	3.0		9.4	2.1	
30-39	84	13.7	2.9		9.2	3.1	
40-49	107	13.4	2.5	0.306	8.5	2.2	0.427
50-59	104	14.0	2.7		9.1	2.4	
60≦	15	12.8	1.3		9.1	2.7	
Career as an occupational health nurse (yr) [B)]							
≦ 10	136	13.7	2.5		8.8	2.7	
11-20	99	13.6	3.2	0.929	9.1	2.5	0.409
21-30	70	13.9	2.5		9.2	2.2	
31≦	20	13.4	1.5		8.2	2.2	
Educational level [B)]							
Vocational School	134	13.1	2.7		8.7	2.7	
Nursing junior college	58	14.0	2.7	0.032	9.1	2.3	0.078
University	100	13.6	2.5		8.8	2.4	
Graduate school	29	14.2	2.8		10.2	2.2	
National qualification [A)]							
Public health nurse	241	13.7	2.8	0.070	9.3	2.4	0.000
Registered nurse	84	13.0	2.4		8.0	2.5	
Qualification [A)]							
Registered occupational health nurse of the society[1)]							
Yes	196	14.0	2.7	0.006	9.3	2.7	0.010
No	129	13.2	2.5		8.5	2.2	
Position [A)]							
Nurse manager	38	14.1	2.7	0.236	10.4	2.4	0.001
Staff nurse	257	13.7	2.6		8.7	2.5	
Affiliation[B)]							
Corporation	238	13.4	2.5		8.7	2.4	
Health insurance association	35	14.6	2.9		10.2	3.1	
Public office	5	15.7	2.9		12.0	1.7	
Industrial health organization	9	13.3	3.6	0.123	9.5	3.5	0.049
Health check organization	7	13.6	1.9		9.8	1.9	
Hospital	13	13.5	3.5		8.6	1.9	
Educational organization	9	12.1	3.1		8.2	2.0	
Employment[A)]							
Full-time worker	253	13.6	2.7	0.518	9.2	2.6	0.036
Others	72	13.1	2.6		8.3	2.2	
Supervisor							
Occupational health nurse	56	13.7	2.2		9.1	2.2	
Occupational health physician	53	13.8	2.9	0.512	9.9	2.4] 0.033	0.049
Others	210	13.6	2.5		8.7	2.7	
Marriage [A)]							
Yes	234	13.5	2.5	0.125	9.0	2.4	0.849
No	81	13.7	2.7		8.8	2.7	
Child-care experience [A)]							
Yes	169	13.4	2.6	0.295	8.9	2.2	0.678
No	98	13.7	2.7		8.9	3.0	
Family-care experience [A)]							
Yes	55	13.4	2.7	0.766	9.6	2.6	0.118
No	212	13.6	2.7		8.7	2.5	

Table 2: Relationship between career anchors and demographics characteristics (N=325) (continued)

	Autonomy/independence (AU)			Security/stability (SE)			Entrepreneurial/creativity (EC)		
	Mean	SD	*p*	Mean	SD	*p*	Mean	SD	*p*
Overall	12.3	2.9		12.2	2.4		10.0	2.9	
Age(yr) [B)]									
≦29	12.4	2.7		12.4	2.3		11.5	2.0	
30-39	12.1	3.1		12.1	2.4		10.0	3.3	
40-49	12.2	3.0	0.872	12.0	2.4	0.833	9.8	2.9	0.255
50-59	12.5	2.8		12.4	2.6		10.3	2.8	
60≦	12.1	2.9		12.5	1.8		9.4	2.6	
Career as an occupational health nurse (yr) [B)]									
≦ 10	12.3	2.9		12.3	2.4		10.1	3.0	
11-20	12.5	2.9	0.158	12.3	2.5	0.930	10.1	3.0	0.378
21-30	12.2	3.1		11.9	2.4		10.1	3.0	
31≦	11.1	2.5		12.0	2.5		8.8	1.6	
Educational level [B)]									
Vocational School	12.1	3.3		11.8	2.4		9.8	3.1	
Nursing junior college	12.5	3.0	0.127	12.5	2.1	0.434	9.6	2.4	0.081
University	11.9	2.7		12.2	2.7		10.2	2.8	
Graduate school	12.9	2.1		12.3	2.5		10.9	2.2	
National qualification [A)]									
Public health nurse	12.3	2.9	0.669	12.2	2.5	0.231	10.2	2.9	0.019
Registered nurse	11.8	2.9		11.6	2.4		9.3	2.6	
Qualification [A)]									
Registered occupational health nurse of the society[1)]									
Yes	11.9	3.1	0.106	12.1	2.3	0.338	9.6	2.8	0.089
No	12.3	2.9		12.0	2.7		10.2	2.8	
Position [A)]									
Nurse manager	12.9	3.0	0.186	11.2	2.1	0.425	10.6	2.2	0.106
Staff nurse	12.1	2.9		12.1	2.6		9.9	2.9	
Affiliation[B)]									
Corporation	12.0	2.9		11.9	2.5		9.8	2.7	
Health insurance association	14.0	2.5		13.2	2.5		11.2	3.8	
Public office	12.0	6.9		13.3	0.6		10.0	3.5	
Industrial health organization	13.5	3.7	0.031	12.5	2.8	0.099	9.9	1.5	0.766
Health check organization	11.5	1.0		13.0	1.6		11.3	2.4	
Hospital	11.0	2.8		12.0	1.6		9.7	2.2	
Educational organization	10.8	1.4		12.4	2.4		9.8	2.6	
Employment[A)]									
Full-time worker	12.3	2.9	0.227	12.2	2.5	0.707	10.1	2.9	0.502
Others	11.8	3.2		11.5	2.4		9.6	2.6	
Supervisor									
Occupational health nurse	12.3	2.6		12.3	2.6		12.6	2.1	
Occupational health physician	13.1	3.1	0.226	13.1	3.2	0.740	12.5	2.6	0.880
Others	12.1	3.0		12.1	2.9		12.1	2.4	
Marriage [A)]									
Yes	12.2	2.9	0.709	12.0	2.5	0.147	10.1	2.9	0.527
No	12.0	2.8		12.2	2.3		9.7	2.7	
Child-care experience [A)]									
Yes	12.4	2.9	0.495	12.0	2.3	0.432	10.1	2.8	0.874
No	11.9	2.9		12.2	2.3		9.8	2.8	
Family-care experience [A)]									
Yes	13.0	3.2	0.010	12.3	2.7	0.368	10.2	3.0	0.184
No	12.0	2.8		12.1	2.5		9.9	2.8	

Table 2: Relationship between career anchors and demographics characteristics (N=325) (continued)

	Service/dedication to a cause (SV)			Pure challenge (CH)			Lifestyle (LS)		
	Mean	SD	*p*	Mean	SD	*p*	Mean	SD	*p*
Overall	12.7	2.9		12.7	2.8		13.3	2.6	
Age(yr) [B)]									
≦29	13.8	2.5		13.6	2.1		12.9	1.9	
30-39	12.5	2.7		13.0	2.9		13.2	2.7	
40-49	12.4	2.9	0.118	12.4	2.9	0.228	13.0	2.7	0.261
50-59	13.2	2.9		12.9	2.7		13.7	2.5	
60≦	12.0	3.4		11.7	2.4		12.3	2.4	
Career as an occupational health nurse (yr) [B)]									
≦ 10	12.7	2.7		12.7	2.7		13.4	2.5	
11-20	12.7	2.9	0.171	12.6	2.9	0.174	13.4	2.7	0.070
21-30	13.2	3.0		13.2	2.9		13.3	2.6	
31≦	11.6	1.8		11.6	1.9		11.8	2.6	
Educational level [B)]									
Vocational School	12.3	3.0		12.2	2.9	0.026	12.8	3.0	
Nursing junior college	12.7	2.4	0.074	13.3	3.0	0.005	13.1	2.2	0.080
University	12.7	3.1		12.6	2.7		13.6	2.4	
Graduate school	13.7	2.3		13.7	2.3		14.2	2.6	
National qualification [A)]									
Public health nurse	11.8	2.5	0.001	13.1	2.7	0.001	13.5	2.6	0.000
Registered nurse	12.9	3.0		11.6	2.9		12.3	2.8	
Qualification [A)]									
Registered occupational health nurse of the society[1)]									
Yes	12.4	2.8	0.183	12.9	2.9	0.142	13.4	2.5	0.429
No	12.8	3.1		12.4	2.7		13.0	2.9	
Position [A)]									
Nurse manager	13.9	2.8	0.012	13.4	2.6	0.214	13.1	2.7	0.012
Staff nurse	12.4	2.9		12.6	2.9		13.9	2.4	
Affiliation [B)]									
Corporation	12.6	2.9		12.6	2.9		13.1	2.7	0.048
Health insurance association	13.1	2.8		13.3	2.9		14.6	2.3	
Public office	18.0	1.7	0.020	14.0	3.7		14.7	1.6	
Industrial health organization	13.9	3.1	0.007	12.7	2.0	0.391	14.0	3.3	0.043
Health check organization	12.0	2.8		12.0	3.8		13.3	1.5	
Hospital	12.6	2.3	0.013	11.7	1.8		12.5	3.0	
Educational organization	10.2	2.4		13.0	2.7		12.3	1.9	
Employment [A)]									
Full-time worker	12.6	2.8	0.476	12.7	2.9	0.766	13.4	2.5	0.634
Others	12.3	3.3		12.7	2.6		12.5	3.2	
Supervisor									
Occupational health nurse	12.9	2.7		13.2	2.6		13.7	2.3	
Occupational health physician	12.9	2.8	0.007	13.2	2.7	0.258	13.0	2.9	0.043
Others	12.6	3.0		12.5	2.9		13.2	2.6	
Marriage [A)]									
Yes	11.9	2.9	0.789	12.4	2.7	0.947	13.2	2.7	0.496
No	12.7	2.9		12.7	3.1		13.4	2.4	
Child-care experience [A)]									
Yes	12.8	2.9	0.284	12.7	2.8	0.823	13.3	2.7	0.750
No	12.3	2.9		12.7	3.0		13.1	2.7	
Family-care experience [A)]									
Yes	12.7	2.9	0.524	13.5	2.5	0.058	13.2	2.7	0.582
No	12.5	2.7		12.6	2.9		12.5	2.5	

SD:Standard Deviation

[1)]Previous education system

[A)] Non-paired t test

[B)] Oneway ANOVA, hypostasis Bonferroni test

Multiple regression analyses of career anchors

Table 3 shows the multiple regression analyses of career anchors. The selected independent variable that explained TF scores was qualification (adjusted R^2 = 0.023). The selected independent variables that explained GM scores were national qualification, supervisor, occupational physician, position, educational level, and graduate school (adjusted R^2 = 0.109). The selected independent variables that explained AU scores were family-care experience, supervisor, and occupational physician (adjusted R^2 = 0.023). The selected independent variable that explained SE scores was years of experience as an OHN (adjusted R^2 = 0.013). The selected independent variables that explained EC scores were national qualification, educational level, and graduate school (adjusted R^2 = 0.026). The selected independent variables that explained SV scores were national qualification, position, and years of experience as an OHN (adjusted R^2 = 0.065). The selected independent variables that explained CH scores were national qualification, educational level, graduate school, educational level, nursing junior college, and family-care experience (adjusted R^2 = 0.079). The selected independent variables that explained LS scores were national qualification, position, years of experience as an OHN, and position (adjusted R^2 = 0.086).

SE, SV, and LS types were lower when OHNs had more years of experience. Education level was related to GM, EC, and CH, and those who attended graduate school had career anchor scores higher than those who attended vocational school. National qualification was related to GM, EC, SV, CH, and LS type; the career anchor score of those with a PHN qualification was higher. Qualification was related to TF type; career anchor score with qualification was higher. Position was related to GM, SV, and LS type; career anchor score with nurse managers was higher than career anchor score with staff nurses.

Table 3: Multiple regression analyses of career anchors (N=325)

Dependent variables	Selected independent variables [A)B)]	Standardized partial regression coefficient β	*p*	Adjusted R^2	F of regression equation	Significance of F
Technical/functional Competence (TF)	Qualification	0.161	0.006	0.023	7.675	0.006
General Managerial Competence (GM)	National qualification	0.228	0.000	0.109	9.896	0.000
	Supervisor: Occupational health physician	0.149	0.008			
	Position	0.161	0.004			
	Education level : Graduate school	0.120	0.033			
Autonomy/independence (AU)	Family-care experience	0.121	0.039	0.023	4.383	0.013
	Supervisor: Occupational health physician	0.115	0.049			
Security/stability (SE)	Career as an occupational health nurse	-0.127	0.031	0.013	4.711	0.031
Entrepreneurial/creativity (EC)	National qualification	0.128	0.028	0.026	4.895	0.008
	Educational level : Graduate school	0.120	0.040			
Service/dedication to a cause (SV)	National qualification	0.147	0.012	0.065	7.684	0.000
	Position	0.196	0.001			
	Career as an occupational health nurse	-0.159	0.010			
Pure challenge (CH)	National qualification	0.202	0.000	0.079	7.228	0.000
	Educational level : Graduate school	0.149	0.009			
	Educational level : Nursing junior college	0.136	0.018			
	Family-care experience	0.128	0.025			
Lifestyle (LS)	National qualification	0.194	0.001	0.086	10.085	0.000
	Career as an occupational health nurse	-0.197	0.001			
	Position	-0.154	0.010			

Stepwise method multiple regression analyses

[A)]Quantitative variable; Technical/functional Competence (TF) score, General Managerial Competence (GM) score, Autonomy/independence (AU) score, Security/stability (SE) score, Entrepreneurial/creativity (EC) score, Service/dedication to a cause (SV) score, Pure challenge (CH) score, Lifestyle (LS) score, and Career as an occupational health nurse.

[B)]Qualitative variable (Nominal scale); National qualification (1: Public health nurse, 0: Registered nurse), Qualification (1: Yes, 0: No), Position (1:Nurse manager , 0:Staff nurse), Employment (1:Full-time worker , 0:Others), Marriage (1: Yes, 0: No), Child-care experience(1: Yes, 0: No), Family-care experience (1: Yes, 0: No), Educational level: Nursing junior college (1: Nursing junior college, 0: Vocational School), Educational level: University (1: University, 0: Vocational School), Educational level: Graduate school (1: Graduate school, 0: Vocational School,), Supervisor: Occupational health physician (1: Occupational health physician, 0: Occupational health nurse), and Supervisor: Others (1: Others, 0: Occupational health nurse,). Nominal scale was introduced a dummy variable. Education level was classified using vocational level as a reference category, and supervisor was classified using occupational health nurse as a reference category.

4 Discussion

Characteristics among OHNs regarding each career anchor score

In a previous study of nurses at university hospitals, the scores of LS type were highest in eight career anchor types in the following order: SE, TF, SV, CH, AU, EC, and GM [19]. Furthermore, for nurses at general hospitals, the scores of LS type were the highest in eight career anchor types, in this order: SE, SV, TF, CH, AU, EC, and GM [15]. Another study of nurses had highest scores in this order: SE, SV, TF, AU, EC, and GM at university hospitals, and TF, SV, SE, AU, GM, and EC at emergency departments [11]. In a survey of career anchors for full-time male workers, the order of career anchor scores was SE, GM, AU, EC, and TF [20]. Comparing previous research to our results, the characteristics of career anchors among OHNs resembles those of emergency department nurses: the TF score was the highest. As in previous studies among HNs [15, 20], LS score was the highest and GM score was the lowest.

OHNs are often asked for specialized advice and support; therefore, many OHNs and emergency department nurses want to exercise professional knowledge and skills in the workplace. In addition, the substantial number of LS type likely reflected the high proportion of women in this study. In previous studies of HNs [15] and APHNs [13, 14], the results were similar; therefore, when obtaining qualification, they likely chose a job that offers balance between work and private life. Moreover, there were a small number of GM type compared to full-time male workers. In addition, only approximately 10% of the OHNs worked in managerial positions, which is negligible compared to APHNs [13, 14]. In recent years, the Japanese government has tried to increase the number of female managers; however, likely related to Japan's specific culture, only a small number of women wish to be promoted to managerial positions. This issue is prominent among OHNs .

Characteristics of career anchors among OHNs regarding demographic characteristics

OHNs aged in their 20s had the highest score in six career anchors (excluding LS). SE, SV, and LS types were lower when OHNs had more years of experience. The results contrasted with previous studies regarding age and career as an OHN. OHNs in 20 ages need to professional education while motivating work. Qualification was related to TF type, career anchor score with qualification was higher by multiple regression analyses. It is necessary to educate the young

generation firmly while utilizing the educational system such as academic society.

OHNs from graduate school had the highest score in seven career anchor types (excluding SE); OHNs from vocational school had the lowest score in six career anchor types (excluding AU and EC). This difference per educational level was consistent with previous research [15]. In that study, two educational groups were compared: university (university and graduate school) and non-university (vocational school and nursing junior college), and the overall career anchor scores of the university group were higher than those of the non-university group. Therefore, perhaps career anchors increase as educational level increases. In addition, OHNs with PHN qualifications had the highest score in six career anchor types (excluding SV). Similar to education level, the scores tend to increase when nurses had a PHN qualification rather than only an RN qualification.

Moreover, there were significant differences regarding position: managers had higher scores than did staff nurses per GM and SV types, which was similar to previous research [11, 15]; however, we cannot infer a causal relationship (OHNs could have become managers because of high GM scores or vice versa). In previous research[11], SV was more common than GM among nurse managers; consequently, we considered that OHNs become managers and they would like to serve supervisor, staff, corporation, and employee by degrees.

OHNs who worked full-time had the highest scores in six career anchors (excluding CH). This contrasted a previous study [3], where employment concerns among OHNs was a critical factor of career crisis. Therefore, it is necessary to develop an educational and social system.

There were significant differences related to marriage and child-care experience in previous research [15, 19]; however, there were no significant differences related to marriage and child-care experience in this research. Many OHNs change the job the opportunity of marriage and childbirth because OHNs are day shift work. Therefore, we considered many OHNs prefer LS type by marriage and childbirth.

Limitations and future directions

Admittedly, we did study OHNs with a certain level of professional awareness as we targeted members of the Japan Society for Occupational Health. According to a survey by the Japanese Nursing Association, there are 12,300 nurses working in other offices. Therefore, our study only addressed a small fraction of OHNs. Previous studies have had response rates around 15%, comprising approximately

400 OHNs. In addition, when planning surveys with OHNs, it can be difficult to determine where they work; therefore, surveys are often conducted among those who are members of the Japan Society for Occupational Health. In this survey, the response rate was below 60%; therefore, subject-related bias is a potential limitation. Furthermore, it is not possible to derive any causal relationships, because this study was a cross-sectional survey. Moreover, career anchors are not universal indicators; they change depending on the number of years of experience as an OHN, their position, and so on. Consequently, it is necessary to conduct a longitudinal examination. In the future, we hope to examine the various effects of job satisfaction and the formation of career anchors, which may contribute to OHNs' career development.

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