

Research Article

Comparative Research of Care Workers in Australia and Japan at Nursing Homes for the Aged: Evaluated from Number of Steps during their Work and Sleeping Record

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Abstract

Aging in Japan is advancing at a globally unprecedented rate. Thus, more care workers are required. Instead, there is a serious shortage of care workers there, due to poor treatment and working conditions. In 2013, the Ministry of Health, Labour and Welfare has noted that the issue of backaches among Japanese care workers had become serious in the previous 10 years. It is obvious that care workers are exposed to higher risk to the possible occupational accident. The purpose of this study is to clarify care workers' labor conditions in Japan to contribute to the improvement of their occupational health and safety. In this study, the authors conducted a survey of 20 nursing homes in the Kinki Area of Japan and 7 Australian nursing homes in Victoria together with a survey to workers involved in care working to conduct physical measurements and examined the impact that the care labor environment has on care workers themselves, by determining the number of steps they take during their work and their sleeping conditions, then compared the results.

The results showed that Japanese Care Workers have much harder working conditions than Australian Care Workers do. Although the lifestyle, culture and labor environments of these two countries are different, it is important for the Japanese to introduce technology and practice work sharing, as well as taking turns and working different hours, as Australians do to relieve caretaking burdens.

ABBREVIATIONS

ANF: Australian Nursing Facility (7 facilities cooperated with the authors); JNF: Japanese Nursing Facility (20 facilities cooperated with the authors); ACW: Australian Care Worker (10 care workers working at an ANF in Melbourne, Victoria, Australia); JCW: Japanese Care Worker (20 care workers working at a JNF in Kinki Area, Japan); BPSD: Behavioral and Psychological Symptoms of Dementia; MMSE: Mini Mental State Examination; ADL: Activities of Daily Living

INTRODUCTION

In response to an increased aging population in Japan, nursing-care insurance programs began in 2000. The initial number of elderly people who received certification of long-term care need was 2.18 million, a number which reached 4.69 million people in 2009. Along with the increased number of people requiring long-term care, the demand for caretaking labor also increased, so required care services have diversified and been upgraded. People engaged in caretaking labor numbered approximately

550,000 in 2000. In 2025, as baby boomers reach 75 years of age or older, it is estimated that between 2.37 million and 2.49 million caretaking employees will be required in Japan [1].

However, since 2010, the valid job vacancy rate has consistently increased and the shortage of workers has been spreading. Many of these workers move to different jobs. Caretaking labor is considered to be “hard,” “dirty” and “dangerous”. Add to that a reputation for “low pay”, and it has naturally become difficult to secure people for the profession and keep them there. Australia, on the other hand, has been working on improving the working environment, including the promotion of its No Lift Policy, a policy prohibiting nurses and care givers from moving patients by manpower alone, which was formally started at the Victoria branch of the Australia Nursing Federation in March 1998 [2]. Compared to Australia, which is considered a leading care giving country due to its conducting of mid-level burden and mid-level social services, Japan is way behind in the usage of machinery and Information Technology (IT). Also, the tools for caretaking and care quality assessment have not been developed. In this study, we conducted comparative survey research of care workers in Australian and Japanese nursing homes for the aged and examined the impact that the care labor environment has on care workers themselves, by determining the number of steps they take during their work and their sleeping conditions.

MATERIALS AND METHODS

The authors requested employees of 20 Japanese Nursing Facilities (hereafter JNF) and 7 Australian Nursing Facilities (hereafter ANF) to complete a survey in order to obtain basic data, including staff assignments, salaries and the condition of occupational safety education. JNFs were selected based on the information given by authors’ acquaintances, and those which agreed to cooperate in this survey notified the authors by e-mail communication and/or telephone conversations. For ANFs, the authors requested Alzheimer’s Australia Vic to ask facilities to cooperate with our survey and selected from the facilities that agreed to do so. The survey was sent by e-mail to both JNFs and ANFs with an explanation of its purpose. Aside from the survey of the facilities, we requested those facilities to distribute separate questionnaires to their employees. These questionnaires were written in an anonymous style, sealed in envelopes with a return address so that the mail would be directly collected by the researchers. Contents of both the Japanese and English versions were deemed the same through translation and native proofreading.

Regarding the facility information, we asked the facility representatives 25 questions in five categories featuring following matters as shown in (Table 1).

Features of the facility

Questions about the facilities included the number of

Table 1: Feature of Facilities.

	JNF (20)				ANF (7)			
	n	%	Average ± SD	Range	n	%	Average ± SD	Range
Number of Rooms	970		51.1±35.0	13-120	696		99.4±60.3	40-190
Number of Beds	1,751		87.5±17.4	50-168	714		103±57.7	40-190
Entire Number of Employees	1,501		79.0±50.5	41-164	1,144		286±53.8	76-244
Number of Care Workers	1,005	100	95.7±37.0	17-123	755	100	108±36.0	32-135
Full-time Workers	579	58	29.0±9.0	11-53	317	42	45±46.0	4-130
Part-time Workers	391	39	20.0±28.0	2-77	344	46	57±28.0	30-100
Fixed-term Employee/ Contract Employee	35	3	3.0±1.0	1-16	94	12	16±19.0	5-40
Number of Employees Placed Per Day	474	100	23.7±5.3	10-50	328	100	46.9±25.1	10-130
Daytime	386	81	19.3±4.5	8-45	256	78	36.6±32.0	7-93
Nighttime	88	19	4.4±1.0	2-10	72	22	10.3±9.4	2-30
Number of Residents Per Care Worker (Daytime)			4.0±1.5	1.1-6.6			3.0±2.4	1.9-8.6
Number of Residents Per Care Worker (Nighttime)			17.4±4.8	10.0-25.7			13.9±6.1	5.3-20
Number of Residents Per Nurse (Daytime)			19.4±6.0	7.1-33.3			13.5±10.0	2.6-30
Number of New Care Workers (past 1 year)	131		7.3±6.6	1-24	89		14.9±11.5	3-35
Number of Care Workers Leaving (past 1 year)	123		6.5±6.4	0-27	34		5.7±3.1	2-10
Employee Turnover Percentage		12		0-33		5		0-31
Care Worker’s Salary Amount/Hour (yen*)				900-1,450				1,846-2,117
Nurse’s Salary Amount/Hour (yen*)				1,200-2,112				2,592-3,583

*Converted by 1 Yen = 0.95Australia Dollar

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rooms, beds, total employees and care workers, as well as the employment system, the number of care workers entering and leaving in the past one year, personnel turnover percentages, how care workers are allocated and their salaries.

Condition of the residents

The authors asked about the number of residents at the facility, their average age, the criteria for determining the degree of autonomy in the daily lives of aged people with disabilities (bedridden rate) [3], the number of people with dementia (those who scored 23 or under on the MMSE-Mini Mental State Examination [4]), the number of people whose care burden is heavy due to the BPSD-Behavioral and Psychological Symptoms of Dementia [5] and the number of people who require position changes.

Regarding the number of care workers' steps during their work and their sleeping records, the authors requested that care workers of two groups, 10 care workers at S nursing home in Melbourne, Victoria, Australia (hereafter ACW) and 20 care workers at K special elderly nursing home in Hyogo Prefecture (hereafter JCW) to submit such information after wearing an Actimarker and an actigraph to measure the amount of physical activity. Both of these measuring instruments are further described below.

Number of steps and metabolic equivalent (Mets) during work

The number of steps and Mets over 24 hour periods during the subjects' work week were measured by the Actimarker and shown in average value for each hour. Mets is a unit showing the degree of physical activity compared to a person at rest. For example, cooking and house cleaning usually comes to 2.5 Mets (2.5 times more active than at rest), regular walking measures 3 Mets, and jogging is between 6 and 7 Mets.

MEASURING INSTRUMENTS

Each care worker in both groups wore an Actimarker (tri-axial accelerometer made by Panasonic, Japan EW4800) on their hip to measure the amount of physical activity. These same care workers also wore an Actigraph (made by AMI: MicroMin-ionitiongger™) on their non-dominant hands to obtain sleeping and waking data for one week.

Statistical Processing

The Mann-Whitney *U*-test was used to measure variations between the two groups, with $P < 0.05$ being significant. All statistical analyses were performed using the Statistical Package for Social Science (SPSS) version 18.0 for Windows; IBM SPSS Japan, Tokyo Japan.

Informed Consent

Actigraph and Actimarker measurements were taken following a detailed oral explanation of the research and its objectives to all participants. After obtaining their consent, research was conducted with the approval of the Research Ethics Committee of Kansai Medical University (Ethical Committee of Kansai Medical University No. 1117).

RESULTS

Features of the Facilities

The authors requested 22 JNFs and 8 ANFs to complete our survey. 20 JNFs and 7 ANFs did so, a response rate of 90% for JNFs and 87% for ANFs. All JNFs are operated by social welfare corporations while 2 of the ANFs are operated by local governments, 2 are operated by charity and welfare groups, 2 are owned by private corporations and 1 is operated by a religious institution. (Table 1) shows the features of these JNFs and ANFs. The number of rooms and beds at the facilities are: 51.1 ± 35 rooms and 87.5 ± 17.4 beds for JNFs, and 99.4 ± 60.3 rooms and 103 ± 57.7 beds for ANFs. Basically, ANFs offer private room care, but some JNFs give care in rooms with multiple beds.

Regarding the employment pattern of care workers, 58% at JNFs and 42% at ANFs are full-time employees. There are many part-time nurses in Australia, which features a contract employee system, while Japan features a lifetime employment system. The number of residents per care worker is 4.0 ± 1.5 in daytime and 17.4 ± 4.8 at nighttime at JNFs. At ANFs, these numbers are 3.0 ± 2.4 in daytime and 13.9 ± 6.1 for nighttime. Thus, the resident per care worker is higher in Japan. Job turnover percentage for care workers at JNFs is 12%, which is 5% higher than at ANFs. As shown in (Table 1), an ACW earns higher payment than a JCW as the average for the former ranges between 2,592 to 3,583 Japanese yen (27.8 to 37.7 Australian dollars) per hour, while the latter earns somewhere between 1,200 to 2,112 yen (12.6 to 22.2 Australian dollars) per hour (conversion rate: 1 Australian dollar = 0.95 Japanese yen) (Table 1).

Condition of Residents

Characteristics of Residents at Subject Facilities are shown in (Table 2). Among the disabled aged residents' degree of autonomy at JNFs, 1% is mostly independent, while at ANFs, it is 8%.

At JNFs, out of a total 1,530 residents, the biggest share, 38%, are "mostly bedridden" while 21% are semi-bedridden and 22% require assistance when getting out of bed. Bedridden residents usually require some type of care and they spend most of their time sitting on their beds. This shows that a JNF's residents' degree of autonomy is lower than that of an ANF and a higher rate of people are bedridden. Also, the number of residents requiring position changing is higher at a JNF than an ANF. The number of dementia patients was evaluated using MMSE. The authors asked the subject facilities about the existence of BPSD in our questionnaire. The results showed that there are more dementia patients at a JNF than an ANF, but more BPSD at an ANF than a JNF (Table 2).

Amount of Activities and Sleep Records of Care Workers

Number of steps and Mets during work: During the 24 hour work day, the largest average number of steps by a JCW was 1744.5 ± 932 between 20:00 and 21:00, followed by 1570.6 ± 505 between 7:00 and 8:00. The largest Mets average was 2.66 ± 0.5 between 19:00 and 20:00, followed by 2.64 ± 0.5 between 7:00 and 8:00. For an ACW, the largest average number of steps was

Table 2: Characteristics of Residents at Subject Facilities.

	JNF (20)			ANF (7)		
	n	%	Average \pm SD	n	%	Average \pm SD
Number of Residents	1,530	100	76.5 \pm 15.4	762	100	100.3 \pm 56.5
Male	247	16	13.7 \pm 6.2	217	28	36.2 \pm 21.4
Female	1,120	73	62.2 \pm 11.7	385	51	64.2 \pm 43.2
No Answer	163	11		160	21	
Average Age			86.7 \pm 1.7			78.7 \pm 8.8
Residents' ADL	1,530	100		762	100	
Independent in Living	11	1	0.6 \pm 1.1	58	8	8.3 \pm 9.0
Semi-bedridden	326	21	16.3 \pm 19.4	379	50	54.1 \pm 70.0
Bedridden	586	38	29.3 \pm 24.0	170	22	24.3 \pm 19.6
Requires Assistance to Get up from Bed	330	22	16.5 \pm 18.5	140	18	20 \pm 19.4
No Answer	277	18		15	2	
Number of Residents Requiring Position Change	494	32	24.7 \pm 18.0	200	26	28.6 \pm 19.5
Number of Dementia Patients*	718	47	47.9 \pm 39.8	272	36	45.3 \pm 30.6
Number of Residents with BPSD	364	24	20.2 \pm 20.1	255	33	36.4 \pm 29.2

ADL: Activities of Daily Living

BPSD: Behavioral and Psychological Symptoms of Dementia

*Those who score 23 or lower on MMSE (Mini Mental State Examination)

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1507.7 \pm 1437.7 between 18:00 and 19:00 with an average Mets of 2.37 \pm 0.2. This was followed by 1402 \pm 1432 steps between 13:00 and 14:00, and the second highest average Mets value was 2.31 \pm 0.4 between 19:00 and 20:00 (Figures 1 and 2).

Comparing working hours, care taking labor showed its highest Mets from 15:00 to 21:00 for groups from both countries, followed by the hours 7:00 to 14:00. Factors for this include the tasks of helping residents getting up and going to bed, which is normally the largest physical burden for care givers. Over the entire 24 hour cycle, no significant differences in steps and Mets were recognized between these groups, but average steps and Mets from 22:00 to 07:00 were significantly high for a JCW compared to an ACW ($P < 0.05$). During nightshifts in Japan, one care worker watches 20 residents. On the other hand, in Australia, one nurse and one care worker are paired up to assist 40 residents who need personal/hygiene care during the nightshift. Australians strictly observe that personal/hygiene care is conducted in pairs, and they adjust the heights of the beds in order to protect care givers' backs when doing this task. They also use the "sliding sheet" method when changing residents' clothing and positioning their bodies to prevent friction between clothing and residents' skin, a situation which may cause bedsores.

Assessment of daily life rhythm during the week using the Actigraph: The sleeping records and daily activities over a continuous 7 days of one participant of each group were measured using sequential liner Actigraphy. Results were calculated in order to study caretaking labor and sleep conditions (Figures 3).

CONCLUSION

In this study, the authors' objective was to clarify the labor condition of care workers at nursing homes in Japan compared to Australia. The results showed that the number of residents per care worker is 4 in a JNF and 3 in an ANF. In other words, there are more care workers per resident in an ANF and furthermore, it was revealed that salaries for workers at an ANF were higher than that of a JNF.

First, we consider the reasons why JCWs recorded a higher quantity of physical activities is the fact that there are less care workers per resident and the differences in how they care for residents at JNFs and ANFs. One of the national policies in Australia, *National Strategy for an Ageing Australia Discussion Papers* (Australia Co. National Strategy for an Ageing Australia, 2007) issued in 1999, focuses on adopting a policy that covers important initiatives, like dealing with the aged population, healthy aging, plus promoting autonomy and self-care life styles and community services [6].

In Australia, service areas are separated into many sections, like a hotel, and many staff members are involved in taking care of residents. Australian and New Zealand Standard Classification of Occupations (ANZSCO) [7] refer to the necessity of diversional

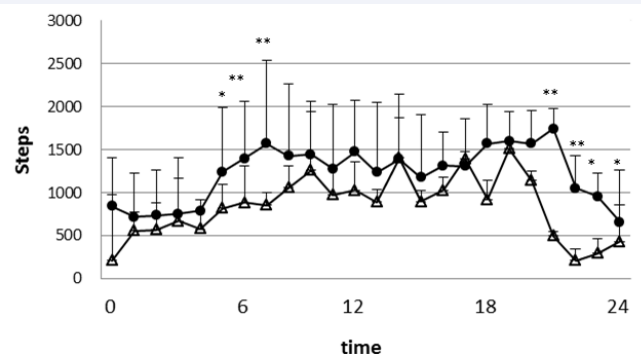


Figure 1 Number of steps during working hours.

JCW (●, $n = 20$), ACW (Δ, $n = 10$).

The error bar is standard deviation. (* $P < 0.05$ ** $P < 0.01$).

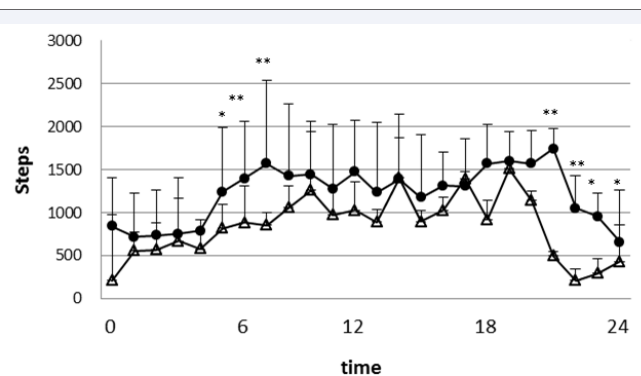


Figure 2 Mets during working hours.

JCW (●, $n = 20$), ACW (Δ, $n = 10$).

The error bar is standard deviation. (* $P < 0.05$ ** $P < 0.01$).

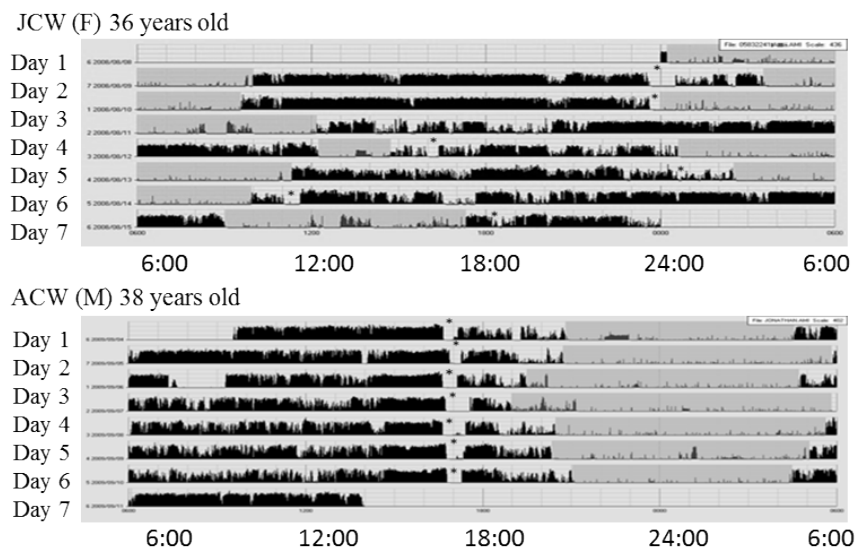


Figure 3 Examples of Sequential liner Actigraphy record.

Examples of the continuous sequential liner Actigraphy record of a continuous 7 days for a JCW and an ACW. The daily activities of participants over a continuous 7 days were measured. The results are represented as peaks that show the activity of each minute (counts/min) by Actigraphy. The black peaks show activity, the gray box show periods of sleep episodes and * show periods of not-attached times such as when taking a bath.

therapists to improve “quality of life” (QOL) by stimulating the lives of residents [8,9]. Also in Australia, kitchen staff members set residents’ tables while care workers help residents eat when necessary. Contrarily in Japan, one care worker has to cover both among all other tasks, as though their job was an extension of family care. Some of the differences in these systems come from cultural and lifestyle differences, but the Australian system seems to avoid disrupting aged people’s rhythm of daily living even when residents suffer from dementia or have low ADL and require greater care needs. It’s been reported that care for dementia based on guidelines [10] and perceptions of residential care improves the QOL of residents at nursing homes [11]. It has become clear that in Japan, it is important to try to improve caretaking labor by reviewing the quality and allocation of those people who offer services as well as adopting care taking conducted by a team.

Secondly, it was revealed that hourly salary rate for a worker at an ANF was higher than that of a JNF.

Currently, the turnover rate of care workers in Japan is higher than the average of all other industries. It has been difficult to secure the needed manpower in this field. The Ministry of Health, Labour and Welfare considers part of the problem to be the treatment of care workers, including low wages, and established a grant system to improve this situation. Despite this, by December 2009, only 80% of care service providers in Japan had applied for this subsidy [12].

In Japan, nurses and care workers cooperate to care for residents. Care workers often quit after a short period due to the difficult working environment, and they frequently suffer burnout. Nurse Burnout and Quality of Care: Cross-National Investigation in Six Countries (U.S., Canada, U.K., Germany, New Zealand, Japan) describes a study regarding hospital nursing in six

countries. In this study, nurses in Japan had a profile suggestive of the highest burnout levels of any of the countries [13].

Care working and nursing are both hard labor, but creating a proper environment better enables those care workers to work long hours. Furthermore, as burnout and quality of care are deeply related, it is important that care workers have a good working environment.

Although major types of employment in Australia and Japan have their differences, taking into consideration the high job turnover rate and low payment, as well as a lack of care workers in Japan, the authors consider it is necessary for care service providers to spend grant money in a proper manner, remembering that improved treatment of care workers is one area where this is required.

Finally, looking at the results of this survey, it is obvious that Japanese care workers have less assistance with their physical labor. The numbers of staff members for personal/hygiene assistance, 70% of the events are assisted by a single worker in a JNF, while all cases in an ANF are aided by 2 workers. Additionally, 60% of the JNFs use manual handling of residents, while 71% of ANFs use lifting aids.

Australia’s, *No Lift Policy* [2] was formally adopted by the Victoria branch of the Australia Nursing Federation (ANF) in March 1998. Documents issued after 2000 have reported that the

Table 3: Care Workers Characteristics.

Care Workers	JCW (n=20)	ACW (n=10)
Age	24.2±3.3	36.2±9.1
Male (%)	9 (45)	3 (30)
Female (%)	11 (55)	7 (70)
Years Working	3.7±2.4	5.3±3.0

degree of patients' autonomy has improved, particularly since machines have started being used at caretaking work sites [14].

In Japan, wheelchairs are often used with the purpose of preventing falling, which may cause lawsuits from family members, and using machines has not yet become popular. This seems to be not only care workers', but the nation's concept toward aged care, which is largely different from that of Australians. In the future, it will be necessary to develop care taking that weighs heavily on the premise of "person-centered care" [15]. Results from this study tell us that Australia's caretaking labor system, which uses IT, promotes care conducted by teams and care equipment, and encourages the autonomy of those who receive care, which facilitates care givers' health. Furthermore, hygienic initiatives that prevent labor injuries provide a useful direction for the Japanese caretaking labor establishment. Japanese people involved in the aged care industry have a lot to learn from the Australian system. According to the "Report from the Review Committee Regarding Improvement of Prevention and Measures Taken at Workplace And Popularization of Such Knowledge" by the Ministry of Health, Labour and Welfare, the number of care givers missing work due to backaches at social welfare facilities which required an absence of 4 days or longer was a little less than 400 in 2002, but increased to close to 1,000 in ten years [16].

88.4% of the workplaces where care workers and nurses involved in lifting patients and residents are working on measures to prevent backache. However, while 82.1% of them state that they are "familiarizing workers in proper ways of moving and lifting patients/residents", only 39.3% are "trying to decrease the physical burden on workers by using equipment and facilities including lifts" [17].

The Australia Nursing Federation recommends banning the moving of patients only through man power. Improving Japanese care workers' occupational health and safety, such as adopting a no lift policy, is not only the responsibility of those in the nursing service business but also of the government. Those who are concerned should seriously look at the way occupational health and safeties are handled in Australia. Additionally, the authors hope involved people will work on enhancing labor safety education so that nursing homes and care workers will be able to improve their working environments by themselves.

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