A Study on the Lost Seeking Devices and Systems for Dementia-Patients

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***Abstract*—This paper utilized a user-centered design approach as the foundation for technology in dementia care in order to improve the quality of telemedicine service. A status-quo analysis and questionnaire survey were conducted to explore the actual needs of the elders in using the lost seeking devices and the problems they encountered. 37 caregivers for people with dementia were surveyed. Through analysis and induction, 3 problems were identified: poor information transmission, low user acceptance, individual material security anxiety. 2-4 improvement proposals are suggested for each problem.**

Keywords-Care-givers; Dementia; e-Health; Safety; Telemedicine services; User-Centered Design; Wandering

I. INTRODUCTION

In the e-era, e-Health is an important issue. Telemedicine service is a means to realize the e-health. In order to have good quality of telemedicine service, the needs and requirements of users are essential elements. Nowadays, some institutes apply this kind of service through lost seeking devices to help find lost people, especially for dementia-patients. However, the users' behaviors and opinions related with these systems and devices are still unknown. Based on the user-centered design (UCD) concept, this paper aimed to find the needs and requirements from users, and expected the results could be used as the foundation for technology in dementia-patient care.

Dementia is now recognized as a global issue of increasing importance, affecting some 24 million people around the world [10]. In Taiwan, the population of demented agedness has been up to a million. People with dementia experience progressive cognitive impairments that typically begin with short term memory problems but can encompass language deficits, difficulties initiating tasks, planning, monitoring and regulating behavior, and visuospatial difficulties [9]. The neuropsychiatric changes in dementia are nearly universal and may result in extremely challenging management problems [14], and heavy burden on caregivers.

However, wandering behavior is the reason that many family members unable to take care the demented elders in the house [2][15]. The most controversial application of technology for dementia care in e-Health and telemedicine services is seen in the application of tracking and surveillance equipment. Proponents of these technologies argue that the technologies reduce caregiver stress and increase individual autonomy since they allow the person with dementia having freedom to move around as they wish [12][13]. Critics however argue that these technologies are an infringement of people's civil liberties and undermine the personhood of the individual [8]. However, assistive technology is a key aspect of improving healthcare. Bjørneby et al. [5] stated that the technologies should: 1) give a feeling of independence to the person; 2) support the person in making choices; 3) have a positive impact on his/her life; 4) support skills maintained or do not emphasize lost skills; 5) not focus on the user as a person with disabilities, but supports the self image of being a person with abilities; 6) remind the solutions that existed before; 7) the use of the products is possible by the information visible/available at all times. They [4][5] further elaborated on this and presented an adaptation of design for all principles in development of assistive technology for people with dementia.

The existing technologies and systems are often expensive and unsuitable. Choosing the appropriate assistive technology is not always easy and there is a wide range of different technologies that can be adapted and used for people with dementia to cope with the practical problems encountered in daily life [6]. The UCD model advocates a design process that involves users in the whole design process in order to match the product to the user requirements and to increase its practical use [13][7]. This study adopted the UCD approach to investigate the processes, devices, and methods employed in dementia care, especially for lost seeking.

This paper is divided into six main sections. Section 1 provides some background information about the beginning of the project. Section 2 outlines the overview solutions for getting lost or wandering. Section 3 describes the interview with questionnaire. Section 4 summarizes results and analysis. Section 5 delineates some of the problems encountered. Finally, the implications of findings are discussed.

II. OVERVIEW SOLUTIONS FOR GETTING LOST OR WANDERING

A. Wandering Behavior

The main character of dementia is the decline of their memory and learning comprehension [1]. Due to the problem of memory and orientation, wandering behaviors and easily-to-be-lost always happens on dementia-sufferers [18]. There are 37% of dementia-patients developing to have wandering behaviors [3]. When they are lost, it is very important to help them and prevent them from wandering. Today, to the family members of the missing elders, they can only report to the Seeking Center of Missing Elders, police, newspapers, mass media, and broadcast or post the missing person's photos.

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Table I gives an overview of the solutions for getting lost or wandering behavior as described in the literature. This table is probably not exhaustive. However, the most important solutions are mentioned.

TABLE I. OVERVIEW OF SOLUTIONS FOR GETTING LOST OR WANDERING IN DEMENTIA

Type	Method
Police network	Report to the local police office when family is missing, providing them detailed and complete information, such as their clothing, hair style, blood type, age, gender, height, and obvious characters.
Seeking Center of Missing Elders	Report to the Seeking Center of Missing Elders, connecting to the police network.
Poster	Post posters in public places through the seeking center.
Broadcast media	Ask for audience's help through the Police Radio Station.
Cable station	Announce the seeking information through local cable stations.
Hospital	Inquire the emergency center of local hospitals, or provide them photos to identify.

B. *Lost Seeking Devices*

The consequences of getting lost or wandering are very diverse. Wandering and disorientation may cause them with anxiety, boring, or less exercise [11][16][17]. However, outdoor activity is important to the dementia-patients. Since the patients are level and situation-dependent, the demand from caregivers and individual care-giving environment are different from one by one. Some lost seeking devices with e-Health system are developed and marketed. Most of them are small, easy to wear and carry around, not easily loose, and water-proofing, strong features, but the sizes and usage are different. There are roughly three kind of lost seeking devices: non-electronic, electronic, and biometric (Table II). Each product has its own pros and cons, and can be featured: 1) By the usage: portable, wearable, and biometric; 2) By the materials: paper, plastics, and stainless steel, et al; 3) By the labeled information: photo, name, emergency contact number, address, sufferer's history of chronic cases, battery and system operating signals, and function bottoms.

TABLE II. OVERVIEW OF SOLUTIONS FOR THE LOST SEEKING DEVICES IN DEMENTIA

category	Non-electronic			electronic		biometric
	Self-made ID card	***Case history wrist***	***Missing-preventing bracelets***	***GPS***	***Electronic care system***	***Fingerprint Verification***
						
Usage	Write down personal contact information on a paper card, and carry it around.	Regularly wear on their wrists.	Regularly wear on their wrists.	Wear the signal emitter.	Regularly wear the emitters on their wrists.	Archive fingerprints into the database of the computers in the police office.
Materials	Paper, or covered with films.	Rubber, plastics.	stainless steel	Plastic shell, LED lights.	Plastic shell, Velcro.	None
Labeled information	Photo, name, emergency contact, address.	Name, phone number, Notes of sufferer's history of chronic cases.	Telephone of the seeking center.	LED lights showing battery and operating situation.	Pushing bottoms.	None
Advantages	Portable, simple, and easily made.	Portable, wide variety.	Personal information is registered in the computer of the seeking center. Durable materials.	Care-givers can be aware of the location of the sufferers through computer.	The sufferers can call the care-givers by pushing the bottom.	Employ biometric, no need to wear anything, no worry of losing and labeled.
Disadvantages	Nondurable material; no regular format, cannot be easily found.	The users may have the negative feelings of being labeled and marked.	Unsightly modeling; buckle part is easily loose; The users may have the negative feelings of being labeled and marked.	Expensive; Care-givers must be equipped with computer skills; they need to be careful of the battery condition; easily missing.	Expensive; they need to be careful of the battery condition; use it indoor-only.	Need the identify system and equipment; personal information may leak out, increasing the difficulty of promotion..

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III. RESEARCH METHODS

A. Interview with Questionnaire

A status-quo analysis and an interview with questionnaire were conducted. The contents of the questionnaire include subject's personal information, disorientation experience, and their experiences and advices of using the lost seeking-devices. The collected data are analyzed by descriptive statistics. The purpose of the questionnaires is to understand the experience and requirements towards currently available products for dementia-patients. Researchers visited the subjects with the company of social workers. Each interview spent about 40 minutes.

B. Subjects

This study cooperated with the Seeking Center of Missing Elders. Social workers were asked to evaluate the 37 voluntary subjects, who are caregivers and family members of dementia-patients. The qualified subjects are: 1) taking care of adult dementia-patients who are above mild level, 2) taking care of patients having Disability Certificates, or 3) taking care of patients who have experienced disorientation. 17 care-givers in this study are male, 20 female, and their ages were from 28 to 86 years old (M = 50.08, SD = 15.47). The dementia-patients: 16 are male, 21 female, and their ages were from 40 to 93 years old (M = 72.75, SD = 10.23). The education levels of the caregivers are: below junior high school (24.3%), high school (40.5%), college (27%), above graduate school (8.1%); the profession of the caregivers: homemaker (32.4%), business (32.4%), industry (16.2%), free-lance (13.5%), and government employees (5.4%). The relationship between care-givers and patients, the most is the older generation (70.2%), and then spouse (18.9%). The lost seeking devices used by the dementia-patients: the most is self-made ID card (62.1%); the least is case history wrist, GPS and electronic care system. The lost seeking devices which dementia-patients have used: the most is self-made ID card (72.9%); the least is case history wrist, and electronic care system. 16.2% of patients have no experience. The duration of using the lost seeking devices: the longest is 84 months, the shortest is 3 months (M = 28.56, SD = 25.44).

IV. RESULTS AND ANALYSIS

The data is listed in Table III. In order to eliminate the concern of deviation, the responses of this questionnaires are based on care-givers' first-time experience; question 1, 12, 13, 22 are multiple-choice questions; the percentage is calculated on the basis of the number of responses.

TABLE III. RESULTS OF THE INTERVIEW

No	Question	Results and statistics
1	The reason of disorientation?	Walk outside themselves: 26 (46.42 %) Wandering: 9 (16.07 %) Wuditory and visual hallucinations: 8 (14.28 %) Falling down on the road: 4 (7.14 %) Melancholia: 4 (7.14 %) Run away from home: 2 (3.57 %) Suicidal tendency: 1 (1.79 %) Traffic accident: 1 (1.79 %) Mental retardation: 1 (1.79 %)
2	Duration of disorientation?	Less than one hour: 4 (10.8 %) Less than three hours: 8 (21.6 %) Less than five hours: 0 (0 %) Less than twelve hours: 8 (21.6 %) Less than one day: 15 (40.5 %) More than two days: 1 (2.7 %) More than five days: 1 (2.7 %) More than one week: 0 (0 %)
3	How long did you wait until asking for a seeking assistance?	Less than one hour: 13 (35.1 %) Less than three hours: 4 (10.8 %) Less than five hours: 5 (13.5 %) Less than twelve hours: 6 (16.2 %) Less than one day: 3 (8.1 %) More than two days: 1 (2.7 %) More than five days: 0 (0 %) More than one week: 0 (0 %) Never seperated: 5 (13.5 %)
4	Who found your family?	Stranger: 11 (24.3 %) Police: 12 (32.4 %) Family: 5 (13.5 %) Store staff: 3 (8.1 %) Neighbors and chief of village: 3 (8.1 %) Go home by themselves: 3 (8.1 %)
5	Where were they found?	Neighborhood: 14 (37.8 %) Temple: 1 (2.7 %) Hospital: 2 (5.4 %) Park: 8 (21.6 %) Recreation center: 1 (2.7 %) On the road: 4 (10.8 %) Market: 1 (2.7 %) Train station: 3 (8.1 %) Shopping mall: 1 (2.7 %) Go home by themselves: 2 (5.4 %)
6	The distance of disorientation?	Neighborhood: 10 (27%) About 2 kilometers: 14 (37.8%) Neighboring city: 9 (24.3%) Farther than two cities : 4 (10.8%)
7	How was their clothing when there were found?	Intact: 23 (62.1%) Messy and broken: 10 (27%) Nude: 0 (0%) Losing their things: 4 (10.8%)
8	If they were injured when they were found?	None: 31 (83.7%) Abrasion: 5 (13.5%) Scald: 0 (0%) Fracture: 1 (2.7%)
9	Their mental condition when they were found?	Normal: 13 (35.1%) Silence: 18 (48.6%) Mumbling to themselves: 5 (13.5%) Lethargic sleep: 1 (2.7%)

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No	Question	Results and statistics
10	Their language expression when they were found?	Normal: 17 (45.9%) Dull: 17 (45.9%) Excited: 3 (8.1%)
11	Their excretory function when they were found?	Normal: 32 (86.4%) Incontinence: 4 (10.8%) Incontinence of feces: 1 (2.71%)
12	Who did you ask for help when the first time your family missing?	Caregiver friend: 2 (4 %) Sufferer's friend: 0 (0 %) Neighbors: 4 (8 %) Chief of village: 1 (2 %) Seeking center: 0 (0 %) Police office: 14 (28 %) Seek on your own: 7 (14 %) Spouse of the care-giver: 7 (14 %) Spouse of the sufferer: 4 (8 %) Children of the sufferer: 5 (10 %) Brotherhood of the care-giver: 6 (12 %)
13	The choice of lost seeking report when the first time missing happened.?	Seek on your own: 35 (64.8%) Post photos and posters: 0 (0%) Instant broadcast by chief of the village: 3 (5.5%) Seeking center: 0 (0%) Police office: 14 (25.9%) Hospital: 1 (1.8%) The city funeral parlor: 0 (0%) Local broadcasting radio: 1 (1.8%) Local television station: 0 (0%)
14	When your family were miss again, is the location they being found the same as before?	Yes: 3 (8.1%) No: 34 (91.8%)
15	Was the way you seek them the same as the first time?	Yes: 34 (91.8%) No: 3 (8.1%)
16	Did you buy the seeking-assist products?	Yes: 21 (56.7%) No: 16 (43.2%)
17	What kind of seeking-assist products you have used before?	No experience: 6 (16.2%) Self-made ID card: 27 (72.9%) Case history wrist: 0 (0%) Bracelets: 2 (5.4%) GPS: 2 (5.4%) Electronic care system: 0 (0%)
18	What kind of seeking-assist products you are using currently?	Self-made ID card: 23 (62.1%) Case history wrist: 0 (0%) Bracelets: 14 (37.8%) GPS : 0 (0%) Electronic care system: 0 (0%)
19	The reason?	Doctor's suggestion: 6 (10%) Having disoriented experience: 11 (18.3%) Chronic disease: 6 (10%) Wandering behavior: 13 (21.6%) Suicidal tendency: 0 (0%) Suffering from melancholia: 1 (1.6%) Auditory hallucinations or illusions: 1 (1.6%) Language disorders: 2 (3.3%) Mental retardation: 2 (3.3%) They wore it spontaneously: 12 (20%) Police's suggestion: 6 (10%)
20	How many times of missing before you bought the products?	1: 15 (40.5%) 2: 7 (18.9%) 3 ~ 5: 8 (21.6%) More than 5: 7 (18.9%) (M = 3.5, SD = 4)
21	The acceptance of your family to the product?	High acceptance: 3 (8.1%) Acceptable: 14 (37.8%) No comment: 6 (16.2%) Kind of reject: 5 (13.5%) Totally reject: 8 (21.6%)
22	Who do you ask for help when your family missing with using the products?	Care-giver friend: 2 (4 %) Sufferer's friend: 0 (0 %) Neighbors: 4 (8 %) Chief of village: 1 (2 %) Seeking center: 17 (25.3 %) Police office: 14 (28 %) Seek on your own: 7 (14 %) Spouse of the care-giver: 7 (14 %) Spouse of the sufferer: 4 (8 %) Children of the sufferer: 5 (10 %) Brotherhood of the care-giver: 6 (12 %)
23	The seeking method you chose when your family missing again with using the products?	Seek on your own: 12 (24.3%) Post photos and posters: 0 (0%) Instant broadcast by chief of the village: 3 (8.1%) Seeking center: 4 (10.8%) Police office: 21 (56.7%) Hospital: 0 (1.8%) The city funeral parlor: 0 (0%) Local broadcasting radio: 0 (1.8%) Local television station: 0 (0%)
24	Which way of seeking you think would be the most efficient?	Help myself: 5 (13.5%) With the assistance of police: 6 (16.2%) Stranger's concern: 7 (18.9%) ID documents: 6 (16.2%) With the assistance of technology: 13 (35.1%)

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No	Question	Results and statistics
25	Which kind of seeking-assist products you will use in the future?	Self-made ID card: 5 (13.5%) Case history wrist: 1 (2.7%) Bracelets: 25 (67.5%) GPS: 3 (8.1%) Electronic care system: 3 (8.1%)
26	Do you agree with applying high-tech to seeking-assist facility for demented elders?	Yes: 33 (89.1%) No: 4 (10.8%)
27	Are there any concern of leakage of personal information on the application of high-tech to seeking-assist facility for demented elders?	Yes: 15 (40.5%) No: 22 (59.4%)

Some advices obtained from subjects in the interviews can be summarized in Table IV.

TABLE IV. SOME ADVICES OBTAINED FROM SUBJECTS IN THE INTERVIEW

Advice	No. of Subjects
Dementia-patients move slowly, but would disappear if the care-givers and family members didn't keep their eyes on the sufferers.	17
Prepare some kind of ID cards for the dementia-patients. Some of them are using more than two kinds of lost-seeking devices.	13
Though the phone number of the seeking center is shown on the product, it is not clear and hardly be trusted.	5
Anything related to computer is too complicated to ;learn and is untrusted.	7
Dementia-patients tend to play, fiddle with, or dismantle the devices, which cause the products loosing or missing.	5
Dementia-patients may have the negative feelings of being labeled, so they tend to resist or forget to wear the devices and then lose them.	10
Dementia-patients, when they are lost, tend to lose their things, including the lost-seeking devices.	6
Subcutaneous implantation of microchips and biometric would become a way of lost-seeking.	4
Electronic products are relatively expensive and constrained by the signal reception.	9
The products can only provide limited help.	15

V. CONCLUSION AND DISCUSSIONS

Care-givers' opinions towards lost-seeking report and seeking-assist products were discussed as follows: 1) Reporting to police would be the best choice: when the dementia-patients are missing, care-givers tend to seek on their own, and most of them ask for police's help. With the time passing, police office will announce seeking notice to the seeking center. Thus seeking center is not in the front line of lost-seeking, but working as an information manager. 2) Care-givers' computer skill should be concerned: if the care-givers are elders, or in a lower education level, their computer skills are limited. They showed higher resistance towards electronic and GPS monitoring systems. 3) The seeking-assist product is not colorful enough: probably because too less propaganda or the color of the products is not obvious enough, or they wear the products in a wrong way, when the patients are found on the road, the passengers may be not aware of the patients were wearing seeking-assist products. 4) The patients show resistance to the products: care-givers indicate that the patients showed resistance towards the seeking-assist products, especially male patients. Female patients tend to consider the products as accessories, showing higher acceptance towards bracelets product. Care-givers usually persuade the patients in a way of religion or family love, warning them not to take off the products. 5) The materials of the products are not strong enough: some patients tend to play, fiddle with, or dismantle the products, which cause the products loose or miss. Also, when the products are worn-down or eroded by water, care-givers tend to replace or repair the product by themselves, which causes the specification more messy. 6) Concern of labels and data leakage: most care-givers think the data leakage is not a big deal if the patients can be rapidly found. They indicate that the identification of labeling should be enhanced.

Table III shows there are 46.42% of dementia-patients missing because they walk outside themselves, accompanying with wandering (16.07%), auditory and visual hallucinations (14.28%). Duration of disorientation is mostly less than one day (40.5%), and the care-givers would ask for seeking assistance when the patients are missing within one hour (35.1%). 48.6% of patients were silent when they were found; 45.9% are dull; some old patients were with abrasion due to falling down; incontinence may be caused by tiredness. Therefore, they should be psychologically comfortable treated to relieve their pressure. Regarding the person care-givers ask for help, police is credited with 32.4%, and passengers are 24.3%. Also, the care-givers tend to seek by themselves or by their family, if they are not able to find the patients, they will report to police office and ask for their help, which is in accordance with the response in question 12 and 13. Comparing the disoriented distance, mostly are in the neighborhood and less than 2 kilometers (37.8%). 24.3% patients were found in the neighboring city. However, in the responses of the choice of lost-seeking (question 12 and 13), chief of the village and instant broadcasting are not their first choice. We presume that they might not know these methods, or they take it as privacy, and dislike to be known by others know. In the question of 14 and 15, when the patients get lost again, 91.8% are found in a different location, 91.8% of care-givers seek the patients in the same way as the first time, which shows the route and situation are uncertain, seeking in the same way would reduce the efficiency. Perhaps the

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situation of the patients is uncertain, and the care-givers have only limited way of seeking. This is a must-solve problem, and it is also the main issue of this study.

In the question of what products care-givers have used and what they are using, 16.2% are first-using. Most people use non-electronic products, self-made card (61.1%) and bracelets (37.8%) are the top 2 choices, and some care-givers say they would use both at the same time. For open question, they show that there is telephone number of the seeking center in the bracelets; if they cannot find the card on the patients, bracelets would be the last defensive line. Electronic products are with higher price, and computer skills are required. Considering that 24.3% of care-givers are with the education level of below junior high school, 40.5% are high school, 18.9% are spouses, and most of them are elders, it may be the reason that they tend not to use the electronic products. Additionally, Case history wrist is the least used; it may be because the materials have less durability, even though there is contact information on it. In the question 19 and 20, the reason of using the product is wandering behavior (21.6%), which is in accordance with question 1. Furthermore, most care-givers bought the products after the 3.5 times of missing experience, but only 20% family members would buy the products spontaneously. In addition, the suggestion from doctors (10%) and police (10%) would also be the main reason, which may because of their professional image.

As for the acceptance toward the products, 37.8% of patients show high acceptance, but there are also 21.6% showing totally rejection, often taking the products off or rejecting to wear. Since most patients are the older generation, care-givers persuade them by religion and family love, which may be the reason. Comparing question 22 and 23: care-givers' choices of seeking-assistant and seeking method before and after using the products: 25.3% would choose seeking center, 56.7% choose police office, but the number of seeking themselves decreasing (referring to question 12 and 13), which may because the care-givers mainly use bracelets as the seeking product, and police office is the first choice for reporting. We hope the seeking center can become a center for consultation, the products did relieving care-givers' burdens. Referring to question 24, 25, 26, and 27, technology-assist (35.1%) would quickly find out the missing patients. However, bracelet (67.5%) is the first choice of the future product; 89.1% agree with the application of technology-assist product on aged patients, but there are also 59.4% consider that it may cause data leakage of personal information. We infer that most care-givers hope technological products would increase the efficiency and safety, but they also think it's too expensive and lack of computer skills. This result demonstrates the choice of seeking methods depends on the education level of the care-givers and most of them are elders. The concern of data leakage is also related to today's fraud issue, which may be the reason limiting the promotion of electronic products and biometrics.

Based on the interview and analysis mentioned above, some problems are concluded in Table IV: 1) Dementia-patients move slowing, but disappear when the care-givers and family members didn't keep their eyes on the sufferers. 2) Most care-givers and family members prepare cards for the dementia-patients; some of them are using more than two kinds of seeking-assist products. 3) People are not familiar with the seeking-assist products: they don't know the phone number of the seeking center is on the product. 4) Computer skills are needed for some electronic products. It is difficult to those care-givers or family members who are not well-educated or are in a ripe old age. 5) Some dementia-patients tend to play, fiddle with, or dismantle the products, which cause the products loose or miss. 6) Dementia-patients may have the negative feelings of being labeled and marked, so they tend to resist or forget to wear the products and then lose them. Some care-givers and family members entice the patients to wear the products by their regions, warning them not to take down or miss the products. 7) Some dementia-patients, when they are lost, tend to lose their things, including the seeking-assist products. 8) Most of the seeking-assist products are small, and easily loose, but the sizes and usage are different, and there are also 21.6% Dementia-patients showing totally rejection, often taking the products off or rejecting to wear. Some care-givers and family members expect subcutaneous implantation of microchips and biometric would become a way for seeking. Comparing question 26 and 27: 89.1% care-givers and family members agree with applying high-tech to seeking-assist facility for demented elders. But 59.4% care-givers and family members disagree any concern of leakage of personal information on the application of high-tech to seeking-assist facility for demented elders. 9) Since electronic products are relative expensive and limited by its signal reception, the users are very few; those care-givers and family members with higher education level say they hope the ability of GPS would improve, and its price would decrease. 10) Most care-givers and family members say that for moderate and severe dementia-sufferers, and those who can walk around themselves, the products can only provide limited help. They will finally take the patients to a sanatorium, or hire a care-giver to take care of the patients.

The problems concluded above can be categorized into two directions: disorientation experience and lost seeking. The first one is about Problem (1), (3), and (7), which are related to disorientation experience and choosing a way of seeking; the second one is about Problem (2), (4), (6), (8), (9), and (10), which are the common problems of both ways and products for seeking.

VI. SUGGESTION

From the above discussion, we propose that the seeking products and methods should be re-examined and redesigned. More researches should be implemented in order to increase the sufferers' preference to use the products, and reduce the burden of the care-givers. The general principle of seeking method and product design is suggested as follows: 1) Identification of the products: the products should be worn at a clear position and with vivid color, which would help people quickly find the contact information and increase the efficiency. 2) Since the youngest care-giver was 40 years old, and the average age of subjects was 72 years old, their

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computer skills should be put in concern, if telemedicine service is implemented. 3) The acceptance of the product: reducing the resistance of dementia-patients, and designing the products not easily to dismantle. We should also consider the habits and types of male, female, and patients in different levels. 4) Development of the local reporting system in the community: Since dementia-patients usually get lost in their neighborhood, and there are also 25.3% care-givers and family members would choose seeking center, 56.7% choose police office, a network connecting the office of village chief, recreation center, police office, the seeking center, and an online toll free assistance centre should be set up for convenience locating the lost. 5) Improving the lost-seeking poster design and promotion: according to the collected data, the sufferers were usually found by passengers, through promotion and lost-seeking poster, people will pay more attention on the missing patients. 6) After the lost were found, some actions and consultants should be adopted in order to comfort the patients and reduce their mental pressure in time.

Not only dementia-patients, this principle can also be applied to disabled elderly, mental disorders, and mental retardation patients. The seeking-assist product is still not common; we should do more promotion and lead more people to use the seeking-assist products. Also, the development of reporting system can decrease the burdens of care-givers and police officers. The seeking center would play the role of consultation, report, and promotion. We also expect people will pay more attention to the dementia-patients on the road, guaranteeing their safety.

VII. LIMITATIONS

This paper discovers the problems of current seeking method and facilities, investigating 37 care-givers' opinions, and concluding some suggestions. However, it is very difficult to have subjects willing to take the test. The subjects are mostly from the Seeking Center of Missing Elders, and they mostly live in Taipei City and Taipei Country. It means they may not be the representative of the target population. Therefore, the conclusion of this study probably can only be applied to the Taipei metropolitan. We will consider other towns into our research and further discuss the opinions of care-givers towards seeking methods and facilities.

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