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(一) 為因應我國總人口減少、高齡少子化、人口過度集中大都市，以及城鄉發展失衡等問題，行政院宣布 2019 年為地方創生元年，假設您任職於政府公園或遊憩業務相關主管機關，您將如何在您業務的推動或規劃中，運用休閒遊憩的理念或資源，落實推動地方創生工作，試擬定一份計畫書？(40%)

(二) 請閱讀以下文章後，回答以下問題（中英文均可）

1. 請擬定可能的文章標題 (5%)
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#### Background

The older population is increasing rapidly worldwide [1], and it will increase at a much higher rate in the coming decades [2]. In response to this demographic change that would create a huge impact on society, many governments, professional authorities, and researchers have tried to find ways to increase the health and quality of life of older adults [3, 4]. Active aging, as a way to increase physical activity among seniors, is a goal set by the World Health Organization in response to a growing population of older people in most industrialized nations [5]. A plethora of research has proven that regular physical activity contributes both positive and preventive factors for maintaining health in older adults [4]. For example, physical activity decreases the rate of morbidity and mortality [6], and it prevents conditions associated with cardiovascular diseases [7], diabetes[8], osteoporosis[9], and cancers [10]. Physical activity also helps reduce the symptoms of depression [11] and maintain cognitive functioning [12, 13] in seniors.

Despite the scientific evidence, the number of older adults participating regularly in physical activities remains low in many countries [14-16]. Recently, a socio-ecological model has been used to explain physical-activity behaviors among the population in general. Marcus and Forsyth [17] indicated that upper-level environmental designs and policies are much more effective than lower-level programs in terms of sustainability and population reach in influencing the public's level of physical activity. Therefore, knowing how to improve our environment to help seniors participate in physical activities is essential.

Parks are increasingly acknowledged as important settings for physical activities [18-20] because they are usually located within one's neighborhood and are either free or low cost and easily accessible [21-23]. Parks are used widely by the surrounding community, and in particular, by older adults who have limited mobility [24].

Factors influencing older adults to visit parks include accessibility [19], safety perception [25], presence of facilities [26], park size [27], things to watch [26], events to attend [25], and maintenance [25, 26]. However, studies also show that despite frequently visiting parks, older adults usually engage in more sedentary activities, such as chatting with friends, sitting and resting, or watching others, than do younger visitors [28, 29]. Kaczynski [27] observed 33 parks in Canada and found that parks with more features/facilities were more likely to be used for physical activity, while factors such as size, distance, and amenities were not significantly predictive. Few studies, however, have investigated how specific features in a park affect seniors' physical activity.

In many Asian countries, including China and South Korea, outdoor fitness equipment (OFE) in parks has become very popular. According to Chow's [30] investigation, more than half of the parks in Taipei city and Tainan city have installed OFE. Although the usage of such equipment is not high on other continents, countries such as Spain [31, 32], Portugal [33], and the United States [34] have reported a rapid increase in the number of these equipment in parks and the market for fitness equipment..

With the appearance and growth of OFE, which similar to the shapes and types of fitness equipment found in gyms, parks with such equipment have been given specific names, such as Fitness Zones [34], senior playgrounds [33], or geriatric parks [31, 32]. The latter two names indicate that this equipment is designed especially for the older population, as a response to a rapidly aging population in many industrialized countries.

Despite the availability of OFE for seniors, little research has been conducted to determine older adults' perception of and experience with using this equipment. Whether OFE meets the needs of older adults and the details surrounding its use remain unclear. As Cohen [25] pointed out, more research to investigate which park characteristics and conditions promote the greatest physical activity and utilization is needed. Therefore, in this study, we interviewed seniors who are current users of OFE to gain an in-depth understanding of their experiences. Results from this study can be used to help elucidate seniors' perception of and needs for OFE, thereby providing information that can contribute to the planning and design of parks to improve park-based physical activity for older adults.

#### Methods

Because little research exists on seniors' perceptions of using OFE in parks, qualitative research designs are best to allow researchers to elicit useful, in-depth information for understanding individual attitudes, beliefs, and perceptions within a culture [35]. The following are detailed descriptions of how the qualitative approach was conducted.

#### Data Collection

To select participants who could provide information relevant to the research focus, we adopted purposive sampling [36], approaching seniors (>50 years old) who are OFE users in two case study parks who could provide valuable insights into their experiences in using these facilities and indicated a willingness to be interviewed. Before the interview, participants were briefed by either the researcher or the trained interviewer as to the purpose of the study, and they were also notified that the interviews would be audio-recorded and that all data, with respect to both demographic information about the participant and behavioral information that the participant shared, would be kept confidential. Informed-consent forms approved by the Institutional Review Board (IRB) were signed by participants before the interview. The interviews were held in the outdoor fitness equipment area inside parks, and each interview lasted between 20 and 45 minutes. Observation field notes were also taken on site. The two parks in which the interviews were conducted each had six pieces of OFE equipment (Figure 1). Park attributes, neighborhood population, and older population information are summarized in Table 1. The mean temperature in the study area, Tainan city, is 24.3 Celsius, with an average of 87.4 rainy days per year (number of days with precipitation  $\geq 0.1$  mm) and a mean relative humidity of 77.2 mm [37].

#### Research Instrument

Because the purpose of this study is to explore seniors' perceptions of OFE and their experiences using these facilities, a semi-structured interview guide was developed to ensure that the same basic lines of inquiry were pursued with each respondent. The guide used in the interview process was in line with the main research questions used in this study. In addition to the text-form guide, photos of each equipment accompanied by the equipment name were provided to help participants identify the

equipment to which they referred in the interview and to facilitate the process of transcribing the interview. The semi-structured interview guide and photos are provided in Table 2 and Figure 1, respectively.

### Data Analysis

First, interviews were transcribed from the audio recordings using Microsoft Word software. Second, the researcher reviewed the transcripts several times and checked for accuracy with the interviewers. Third, the text was imported to the qualitative data management software Nvivo 8 (QSR International Pty. Ltd., Melbourne, Australia) for further analysis. Then, an interpretive process, which involved the discovery of similarities and differences among individuals, was performed. A continuing comparison and contrasting of themes within and across individuals, guided by Glaser & Strauss [38], was adopted, and “axial coding” [39], which examined the connection among codes, was used to determine the relationship among links. The actual coding framework was more open-ended and underwent revision once the researcher discovered a previously overlooked element. These analytic procedures helped provide a detailed description of the themes and their patterns. Finally, as the transcripts were in Chinese, the quotes presented in this paper were translated into English by the researcher and then back-translated by two faculty members who are fluent in both English and Chinese to determine whether the original and translated interview quotes were consistent with each other in terms of content and language.

### Results

The following sections present the demographic characteristics of the respondents and describe themes and subthemes found in the interviews and field notes.

#### Characteristics of participants

A total of 55 seniors (27 males and 28 females), ranging from 50 to 97 years of age, were interviewed for this study. Twenty-two of the 55 participants were interviewed in Dongning park and 33 in Xihu park. Most of the respondents came to the park alone. Of the 55 seniors interviewed, 78% indicated that they exercise in the park on a daily basis, 13% approximately three times per week, and 9% twice per week. Most of the respondents visit the park in the early morning, and the duration of their visit was 1-2 hours.

#### Usage- additional park features for seniors to play

Most of the seniors interviewed do not go to the park specifically to use the outdoor fitness equipment; instead, they go to the park to participate in group exercise or to walk, using OFE only as a supplementary activity. They perceive various pieces of OFE as additional park features that are fun to use. Therefore, some older adults see OFE as “playground” rather than “exercise” equipment.

*“I came to the park for group exercise, and I am heading back home soon to do the laundry. But before I go, I’m going to play on the equipment a little while” (X-25, female, 82 yrs. old).*

The duration of equipment use varied between 5-10 minutes and 1 hour, based on the participants’ responses. One respondent also indicated that seniors, in general, do not use OFE vigorously.

*“As we are old, our exercise does not need to be that rigorous.” (X-25, female, 82 yrs. old).*

However, even moderate use of the OFE causes older adults to sweat; as one respondent said:

*“Although we don’t use this equipment very rigorously, using it does cause us to sweat, which is good” (D-03, female, 69 yrs. old).*

Most interviewees reported that they used various pieces of OFE; nevertheless, the most popular piece of OFE among the respondents was the arm stretch, as most of them reported that they have shoulder problems. In addition, some have mentioned that children will play with OFE as well. From our field notes, we observed several wheelchair-bound older adults accompanied by caregivers in the OFE area; however, while we observed that the OFE was used by the caregivers, these older adults either did not exercise at all or did few arm-stretch exercises.

#### Using OFE for health improvement and as pastime

For most of the older adults interviewed, the main purpose of using OFE is to exercise and improve health. Some respondents mentioned that OFE is ideally located since they enjoy being in natural environments. As one female respondent reported:

*"We have had a stationary bike in our house for a long time, but we rarely use it. We like to come to the park to breathe fresh air and use this equipment because it feels more like exercising while coming out (D-03, female, 69 yrs. old)."*

Some of the respondents viewed OFE as an outlet to pass time and to relieve boredom.

*"You know...sometimes we just want to kill time in the park, and if we keep our legs moving while we chat with others, we feel good about ourselves because we are exercising" (X-27, female, 57 yrs. old)*

#### *Benefits of using the equipment for stretching, rehabilitation and to improve one's moods*

Although most of the respondents were unable to identify specifically what types of physiological benefits they gained from using the OFE, they agreed that the equipment did enhance their health. As one female senior mentioned:

*"I don't know exactly if my body has improved or not, but at least, I am exercising and that will lead to better health" (D-09, female, 61 yrs. old)*

Several of the respondents indicated that they use the equipment to stretch or as a station for massage to decrease muscle soreness or stiffness. This is especially the case for those who suffered from frozen shoulder symptoms, lower back pain, and osteophytes. One female respondent said:

*"I have frozen shoulder problems, so I came to the park to do some arm stretches, and then, I came frequently to do the pull. Now, I feel that my shoulder is getting better and becoming more relaxed" (X-34, female, 60 yrs. old).*

Another female, who used to participated in folk-dance activities in the park, reported that she had been in a car accident several years ago and, as a result, was unable to walk for six months during the rehabilitation period. Because her knees could not support her body weight for extended walking, she has been using the equipment in the park for almost the last 10 years to help her to regain lower-limb strength (D-19, female, 75 yrs. old). Another male respondent indicated that he had osteophytes and that purposely comes to the park to use the equipment for the purpose of rehabilitation.

*"I have seen neurosurgeons, who told me that medication is useless. I have to have surgery and then go through rehabilitation. I did not follow his suggestion; instead, I came to use the equipment and found them to be effective" (X-24, male, 58 yrs. old)*

Besides physical benefits, many of the respondents thought that the equipment also improved their psychological well-being.

*"You will feel happier after using the equipment. It is good." (D-21, male, 84 yrs. old).*

*Social interaction-got to know new friends while come frequently*

Although most of the respondents visit the park alone, they have mentioned the equipment area as a social setting.

*"I usually come here alone and my husband would join me later, but it doesn't matter because I come here frequently and I know most the people in the area, it is fun just to be here (X-11, female, 77 yrs. old).*

*"You come here frequently and you become familiar with the other people here, then, you become friends" (X-07, female, 60 yrs. old).*

*Availability-needs more but space is a concern*

Although some respondents think that the number of OFE pieces in parks is adequate, others think there should be more, especially during peak hours such as early morning or late afternoon.

*"I have to take turns to use this equipment, and it is embarrassing to ask those using the equipment to give others a turn. Some people only sit on the equipment to rest, rather than exercise" (D-13, male, 70 yrs. old).*

Although some pointed out the need for more or different types of OFE, they recognized the limited availability of space:

*"We do want to have more equipment, but there is not enough space in the park. One must be careful not to place the equipment too close to each other" (X-11, female, 77 yrs. old).*

*Safety concern-not critical problem, but not suitable for children*

In general, many older adults do not perceive any safety issues in using these equipment, nevertheless, a few did perceive some risks of danger.

*"There are no stoppers in most of the equipment; for example, the wheels continue turning without stopping, and that is dangerous" (X-18, male, 72 yrs. old).*

Some mentioned that falling is a concern for them. Others expressed the sentiment that the use of OFE by children seems to be very dangerous.

*Maintenance and management -needs improvement*

Equipment maintenance and placement have become a serious problem. The respondents mentioned that the equipment need constant maintenance because of rust (X-21, female, 52 yrs. old) and because the equipment need to be lubricated (D-04, male, 97 yrs. old). Several pieces of the equipment are placed on uneven ground, which does not provide stability for the equipment, and causes water accumulation around the equipment after rain. In addition, respondents suggested installing the equipment under trees to provide shade so that users can avoid sunburn and heat during summer.

Several respondents also mentioned that equipment handles and seats should be softer to provide comfort. One male respondent said:

*"The bonny rider is too hard to sit on, and it will increase friction during exercise" (X-18, male, 72 yrs. old).*

*Operation of equipment-most seniors have developed one's own style*

As no instructions are provided for using OFE, most seniors report having developed their own ways to operate the equipment. One participant said that

*"it doesn't matter how you operate it as long as using them provides benefits" (D-12, female, 75 yrs. old).*

One male said that he observed many kids using these equipment randomly, out of curiosity,  
“...but we older adults don't know how to use these equipment” (D-16, male, 77 yrs. old).

#### Discussion

A large number of OFE pieces have been installed in parks in Asia, Europe, and North America, and they have been claimed to meet the needs of the rising aging population. However, little research has been conducted to elicit the point of view of older people in terms of whether these equipment fit their needs and to understand their experiences in using these equipment. This study analyzed responses gathered from in-depth interviews with older people who use OFE and presented the responses under detailed themes and through quotes. The responses can be classified into two main categories to answer the questions of how older people perceive OFE and what their experiences are with using the OFE.

#### *How do older adults perceive OFE?*

The themes from the interviews show that most older adults use OFE to supplement their main activities, which include group exercise and walking in the park. They also use the OFE for fun, to improve health, and as a means to socialize with others. Many of the respondents perceived symptoms of declining physical functions such as joint mobility, or the need to do the rehabilitation exercises as a result of injuries, as reasons for using OFE. Besides physical benefits of using OFE, such as increased motion range, improved cardiovascular function, and decreased muscle sores, respondents also cited psychological and social benefits of using these OFE pieces. For example, they expressed that their moods improved and they enjoyed interacting with other people while using the OFE.

These findings support the ideas of Aparicio [32], which state that using OFE involves all aspects of the human body, including balance, coordination, strength, elasticity, mobility, and agility. In addition, OFE helps treat specific injuries or can be used for rehabilitation purposes that were previously available only in gyms and rehabilitation clinics. In addition, OFE also facilitated social interactions among senior OFE users.

Kaczynski et al., [40] suggested that many park visitors, especially adults, remain sedentary during their visits [41]. This suggests that the provision of OFE can provide opportunities to increase seniors' physical activity, which can improve health through operating the equipment while staying in the park. In particular, older adults acknowledged that operating OFE with low intensity could have substantial health benefits and rehabilitation effect, however, the exact energy expenditure and intensity measure of operating the OFE is unclear. Cohen et al. [34] adopted the System for Observing Play and Recreation in Communities (SOPARC) [42] and estimated OFE user's activity level, measured by METs, to increase from 15% and 8% from baseline to 1st and 2nd follow-ups, respectively. These findings are in consistent with many research that providing more activity settings or presence of facilities in the park are positively related to park use [26, 43, 44]. Moreover, OFE also offer a setting for many older adults residing in urban areas a place to meet and talk with others which is ideal for older adults to form social ties with neighbors, consequently, a sense of social integration developed which is beneficial to older adults' well-being [45].

#### *What are older adults' experiences and suggestions for OFE?*

Although several older adults use all the pieces of OFE available in the parks during their visits, the most popular piece of OFE used by the participants was the arm stretch, as many older adults reported having shoulder problems. OFE designed to increase flexibility (i.e., activities designed to preserve or extend range of motion (ROM) around a joint) appears to be favored by many seniors. Several research have demonstrated that preserving seniors' ROM can affect their functions, in particular by

helping them live independently [46, 47]. Thus, the OFE in the present study appears to meet the needs of seniors' health concern.

Most seniors did not express serious safety concerns regarding OFE, but they are concerned about improved maintenance and placement of OFE. Although OFE is designed with water-resistant material for outdoor environments, the equipment nevertheless requires regular maintenance, especially after the individual OFE pieces have been installed for an extended period. The local weather should also be considered as the humidity in Taiwan is high and the OFE can quickly develop rust if it is not preserved well. Weather conditions should also be considered while planning OFE installations in other regions, such as the length of mild-weather periods in which older people can be outdoors.

As there are no sufficient information labeled on-site indicating who could use OFE stations or specific age restrictions for using them and instructions for how to use such equipment, participants in our study shared with us that they have developed their own ways of operating the OFE or by observing how others have done. Even in our data, while none have reported getting injured while using the OFE, several accidents using OFE have recently been reported in the media. For example, many kids use the OFE without adult supervision and fall from the OFE. In fact, Cohen et al.'s study [34] also found that, in California, other than adults, children have been observed to account for about one-fifth of total fitness zone users. Similarly, in Portugal, researchers have found that more than 44% of OFE users are children [33]. Therefore, it is of urgent need to set out the safety requirements for OFE similar to the legislation set for children's playgrounds. Some of the recommendations for clearance space needed for each OFE device are proposed by Apricio [32]. There are an increasing number of OFE installations in Europe and the U.S. [44, 48], and in spite of these installations offering opportunities for more convenient and no-cost options for the public to be active, safety concerns should be the top priority to avoid any injuries that might be caused.

#### Conclusion

A large number of studies have investigated the relationship between parks and physical activity among older people. Although a considerable number of OFE pieces have been installed in parks in Asian countries, and substantial growth of OFE installations can be seen in European countries and in the United States [34], to the best of researcher's knowledge, no study has examined OFE specifically from the perspective of seniors and through in-depth interviews. Because this study was conducted in Taiwan, where most of the OFE have been installed in parks for a longer time compared to other non-Asian countries, most of the participants reported having used OFE for 2 to 10 years. Hence, the participants were able to address the limitation raised by Cohen [34] in terms of sustainability and provide more extensive information and recommendations than older people in countries where OFE have been installed only recently.

Overall, the findings in this study are consistent with those of other studies on physical activities in parks among older adults [21, 49]. According to the data in this study, seniors believe that using OFE in parks contributes to their perception of health promotion by providing not only physical but also social and psychological benefits. The information in this study also has implications for OFE stakeholders, such as manufacturers, urban planning professionals, park and recreations administrative staffs, and local authorities for enhancing equipment designs and safety regulations to ensure that OFE installations maximize benefits and minimize drawbacks. For example, age-restriction signs to prevent children from being injured in OFE areas are needed. Continued maintenance is also required for OFE sustainability.

Findings from this study should also be viewed in light of its limitations. First, as this study was conducted in two case-study parks in Taiwan, the findings cannot be generalized to be applicable to other regions as outdoor behaviors are greatly

influenced by environmental factors such as weather, location, and the accessibility of OFE in parks. For example, uncomfortable temperatures or bad weather conditions (rain, snow, wind, or heat) can decrease the desire to go out among older adults. In addition, physical activity among older adults is shaped by both personal (physical, psychological, and social) and social factors within one's culture. For example, unlike older adults in other countries, whose participation in physical activities decreased with age [16, 50], research conducted by Lin, Wen & Wai [51] found that adults over 45 years of age show a higher level of regular participation in physical activity than those in the 25-44 year-old age group in Taiwan.

In addition, the OFE pieces in this study were limited to eight types (See Figure 1) which is not a comprehensive sample of the OFE options available on the market, but rather reflective of the most popular facilities in neighborhood parks in Taiwan. As there are many types of OFE available now, future studies could investigate other types of OFE in relation to the perception and experiences of seniors. Furthermore, this study interviewed only community residing seniors who are current OFE users with relative good independence, non-OFE senior users, those who might have negative perceptions or experiences, or older adults with limited mobility, who never use or cease use of OFE may provide better insights in terms of their barriers in using these facilities and needs.

Because little work related to OFE has been done, more research is needed in the future. For example, how do older adults use OFE in terms of frequency, duration, intensity, and energy expenditure? What is the relationship between OFE use and the health status of older adults? Do physical activities involving OFE have a significant impact on seniors' health and functional performance? What are the differences between OFE and traditional gym facilities in terms of an individual's functional performance? What contributes to the successful design of OFE in terms of both the equipment itself and its supporting environment (e.g, is it better to place the OFE along walking trails or within a confined area)? More work has to be performed in collaboration with multiple disciplines and various regions, to investigate the impact of OFE in promoting active aging among seniors.

Although a series questions remain unanswered, the present study has explored the perceptions and experiences regarding OFE use among older people. These findings may be used to help in planning and designing parks as well as research to improve park-based physical activities for older adults.