

# Survey on the Relationship between Beach Environment and Human Mental Health

Chenchen PENG, Kazuo YAMASHITA, and Eiichi KOBAYASHI

**Abstract**—In order to evaluate how a beach environment affects human mental health, this study used the GHQ-12 questionnaire to measure aspects of mental health. A total of 181 people (105 males and 76 females) were categorized into three groups according to different frequencies (high, medium, and low frequencies) of going to the beach completed the GHQ-12. Subjects with high frequency of going to the beach show a significant difference in mental health when compared to medium and low frequencies. The high frequency of going to the beach had a higher significant influence on both males and females than the lower frequency. Beach-going frequencies had a stronger significant correlation for male mental health than for females. Furthermore, respondents in their teens, twenties, thirties, and forties also show a significant difference when compared to the other two frequencies. Particularly, the impact of the beach environment on teens and respondents in their twenties show a higher difference than those in their thirties and forties. These findings indicate that the beach environment is strongly related to human mental health, and males and youngsters are more likely to associated with mental health.

**Keywords**—Beach environment, mental health, GHQ-12, improvement

## I. INTRODUCTION

BEACHES have warm waters, soft sand, and are fantasy spaces associated with leisure time. People enjoy fresh-air freedom and sunshine at the beach [1]-[3]. Recent research has stressed the importance of nature on attributes related to individual's physical activity and well-being. It is now widely accepted that a natural environment is strongly connected to human health [4]-[6].

Japan is an island country located in the western Pacific Ocean, which means there are many beaches around Japan. The average air temperature in August is 25 degrees [7]. Beach environments may be linked to benefits associated with human mental health. One implication of this study is that mental health includes our emotional, psychological, and social well-being, and developing a plan to improve these aspects of mental health can help to improve our overall health.

In order to examine whether beach environments have an influence on human mental health, we used the 12-item

General Health Questionnaire (GHQ-12). The survey was completed by participants who visit the beach at different frequencies: high frequency, medium frequency, and low frequency. Associating the interrelationships between beach environment and human mental health, we also examine three frequencies of going to the beach based on gender and age. This allowed us to gain insight into the impact of beach environment and human mental health.

## II. METHODOLOGY

### A. Subjects

181 people (105 males and 76 females), ranging in age from teens to forties, were recruited from the Kinki Region in Japan to participate in this survey. The subjects were categorized into three groups by their frequency of going to the beach: a) high frequency (more than three times a year); b) medium frequency (twice a year); c) low frequency (once a year or not at all).

### B. Questionnaire

The 12-item General Health Questionnaire (GHQ-12) was used to measure the effects of different frequencies of going to the beach on human mental health. The GHQ-12 is a self-administered questionnaire identifying non-psychotic and minor psychiatric disorders [8]. The GHQ-12 consists of twelve items, which are rated on a 4 point Likert-type scale from 1 (Strongly Disagree) to 4 (Strongly Agree). Each subscale was scored by taking the mean of the item responses. Lower scores were considered to have positive mental health status.

### C. Statistical analysis

Questionnaires with missing or incomplete data were excluded from analysis. In our statistical analysis, the GHQ-12 scores among high frequency, medium frequency, and low frequency of going to the beach were examined, and the gender and age associated with different frequencies of going to the beach were also calculated.

The data were entered and analyzed using the Statistical Package for Social Sciences (SPSS, 2007) software. A one-way analysis of variance (ANOVA) and Tukey HSD post-hoc analysis for multiple comparisons were conducted in order to summarize and interpret the descriptive data. Statistical significance was set at  $p < .05$ ,  $p < .01$ .

## III. RESULTS AND DISCUSSION

Fig.1 presents the proportion of the frequency of going to the beach in this survey. 48 participants (26%) who go to the beach

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once a year or not at all were classified as the low frequency respondents. 69 participants (38%) who go to the beach twice a year were classified as the medium frequency group. 30 participants (17%) who go to the beach three times a year, 20 participants (11%) who go to the beach four times a year, and 14 participants (8%) who go to the beach more than five times a year were classified as the high frequency group.

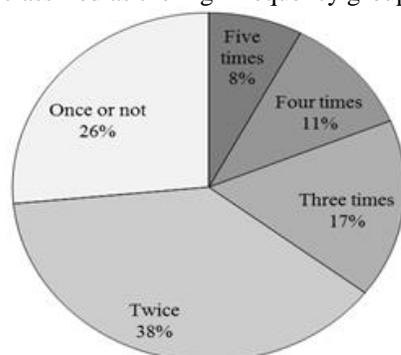


Fig. 1 The proportion of the frequency of going to the beach

#### A. Three frequencies of going to the beach

The data in Fig.2 show a significant difference ( $p < .05$ ) on the GHQ-12 between medium frequency ( $M = 2.01$ ) and high frequency ( $M = 1.71$ ), and low frequency ( $M = 1.96$ ) and high frequency ( $M = 1.71$ ). However, there was no significant difference on the GHQ-12 between low frequency ( $M = 1.96$ ) and medium frequency ( $M = 2.01$ ).

We chose to examine the impact of three different frequencies of going to the beach on human mental health. In the GHQ-12 questionnaire respondents had a marked improvement on mental health that correlated with frequency of beach going. We believe that going to the beach will heal the mind and body out of fatigue, and promote recovery from stress. Experiencing beach environments with open air, beautiful scenery, and being able to view the sea is considered to be a restorative treatment for mental health. Physical activities have been shown to improve general mental health [9]-[12]. When go to the beach, we also enjoy the swimming, surfing, and other physical activities. This finding suggests that beach activities are likely to strongly relate to good mental health.

In Japan, a large number of people experience great stress from work, society, and family issues. Going to the beach could be one important method for improving our mental health.

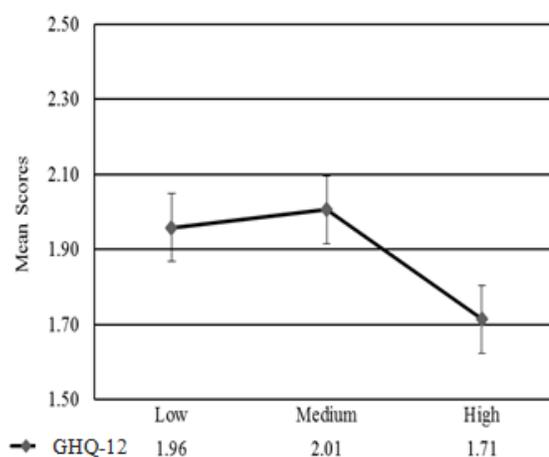


Fig. 2 Mean GHQ-12 scores for three frequencies of going to the beach

#### B. Gender and the frequency of going to the beach

In term of the contrast among the three frequencies of going to the beach based on gender, the data in Fig.3 show significant differences ( $p < .01$ ) on the GHQ-12 between medium frequency ( $M = 1.91$ ) and high frequency ( $M = 1.66$ ), and low frequency ( $M = 1.97$ ) and high frequency ( $M = 1.66$ ) on males. However, there was no significant difference on GHQ-12 between low frequency ( $M = 1.97$ ) and medium frequency ( $M = 1.91$ ). For females, the only significant results were between medium frequency ( $M = 2.05$ ) and high frequency ( $M = 1.80$ );  $p < .05$ ). There were no significant differences between low and medium frequencies, and low and high frequencies. In particular, the mean GHQ-12 scores of males were lower than females.

The gender-based prevalence of GHQ-12 was compared among the three frequencies of going to the beach. The more frequently people go to the beach; the better their mental health is, both for men and women. Moreover, all three frequencies of going to the beach had a stronger positive influence on men's mental health than for women. This may be because some Japanese women avoid the sun's ultraviolet on the beach, and therefore enjoy the beach environment less than men. Furthermore, in Japan, beach activities, such as swimming and surfing to release stress may be more popular with men than women. In Japan, many full-time housewives don't have enough time to go to the beach, due to their demanding schedules. This may be another reason why the beach environment effect on mental health was more pronounced for men.

In sum, the finding reveals that the beach environment improved mental health both for males and females, and there was a significant improvement for males' mental health. We encourage that more women go to the beach to enjoy the sea and do more beach activities.

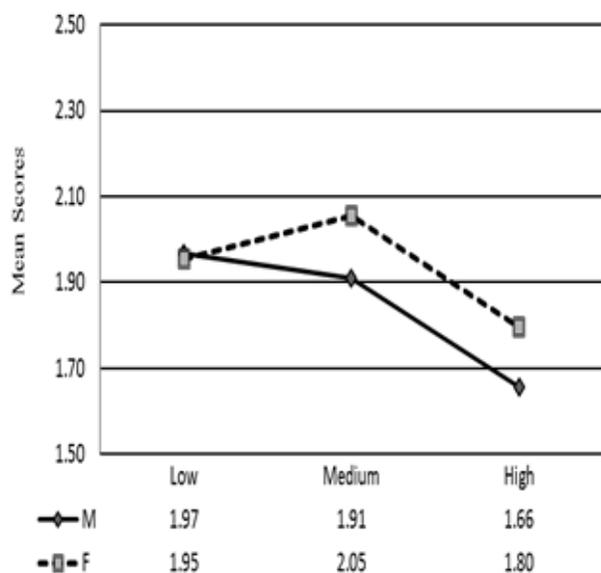


Fig. 3 Mean GHQ-12 scores for three frequencies of going to the beach and gender (M = Males, F = Females)

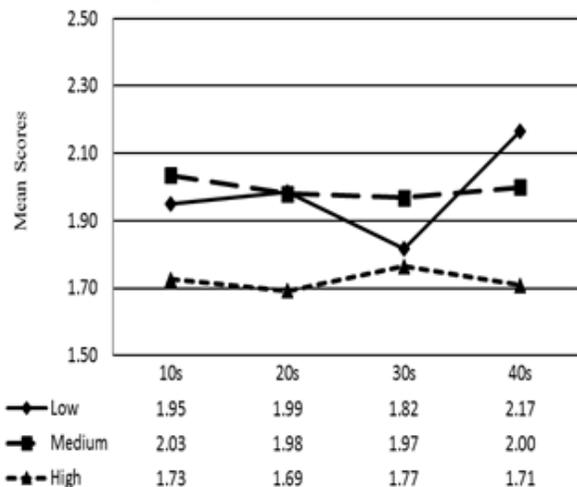


Fig. 4 Mean GHQ-12 scores for three frequencies of going to the beach and age

#### C. Age and the frequency of going to the beach

The results from Fig.4 show the mental health of three different frequencies of going to the beach associated with respondents in their teens, twenties, thirties and forties. The data show a significant difference ( $p < .05$ ) on the GHQ-12 between medium and high frequencies, and low and high frequencies for the group in their thirties, and show strong significant differences ( $p < .01$ ) between medium and high frequencies, and low and high frequencies for teens, and groups in their twenties and forties. There were no significant differences on the GHQ-12 between low frequency and medium frequency for teens, and respondents in their twenties, thirties and forties.

We examined the data for teens, twenties, thirties and forties groups, which revealed a tendency for mean GHQ-12 scores to decrease (indicating good mental health) as the frequency increased. In particular, those in their teens and twenties showed the strongest significant difference. Obviously, the

younger-aged people spend much more time at the beach with families, friends, so the younger-aged people showed better mental health affected by beach environment than those in their thirties and forties.

In this study, we could see the effect of beach-going on different age groups' mental health, despite that the imbalance of different aged participants. Therefore, further studies with larger sample sizes surveying the relation between beach environment and human mental health based on age are needed.

#### IV. CONCLUSION

The results of our study suggest that visiting the beach improves human mental health. In particular, the impact of the beach environment on men and younger people improved mental health. Future studies are needed to investigate how the beach environment affects other psychological factors, such as mood and well-being.

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