Title
Spectators’ Worries and Attitudes during the COVID-19 Pandemic: A Case of a Women’s Volleyball Match in Japan

Running title
Spectators’ Worries and Attitudes

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Abstract
The purpose of this study is to explore spectators’ worries and attitudes during the COVID-19 pandemic and to compare them by age group. The survey was conducted with spectators at a home match for Victorina Himeji, a professional women’s volleyball club in Japan. Two hundred and seventeen spectators rated their worries about becoming infected with COVID-19 after being in the arena as well as their attitudes during the COVID-19 pandemic. The results reveal that spectators visiting the arena had significant levels of worry related to the attendees (e.g., “Gathering crowds of people in the arena” and “Possibility that someone in the arena is infected with COVID-19”). Furthermore, younger people were more worried about COVID-19 infection than other age groups, although no significant difference in attitudes appeared among the age groups. The findings of this study suggest the importance of practicing social distancing in the arena as well as measuring spectators’ body temperature before they enter the arena. Furthermore, sport event organizers may need to implement the strategy of infection prevention based on spectators’ age groups and other personal attributes.
1. Introduction

Since the end of 2019, many sport activities have been affected by the COVID-19 pandemic (Drewes et al., 2021). Especially in professional sport, stricter regulations have been required because players are not the only ones present; spectators also visit stadiums and arenas. For example, the Japanese professional baseball league’s 2020 season started 3 months later than usual (Nippon Professional Baseball Organization, 2020). For a while after the start of the season, games were held without spectators, and all players were regularly subjected to the PCR (polymerase chain reaction) test that is commonly used to detect the virus that causes COVID-19. Even after spectators were permitted in the stadium, the maximum number of attendees was set at 5,000. For the Japanese Volleyball League, depending on the current spread of the infection in Japan, matches were cancelled, held without spectators, or held with the maximum number of spectators set at 50% of the arena’s capacity (Japan Volleyball League Organization, 2021). Sato et al. (2020) report that approximately 75% of Japanese citizens supported the decisions to postpone games for professional sport leagues. However, overly strict regulations are said to be a threat to the sustainability of leagues and clubs (Bond et al., 2020), and it is difficult for governments and sport organizations to make the appropriate decisions.

In this crisis situation, researchers from around the world are sharing information about professional sport and spectators during the COVID-19 pandemic, such as economic impact (Bond et al., 2020; Drewes et al., 2021), the influence of absent in-stadium spectators for professional sport clubs (Herold et al., 2021), the example of volleyball club experiences (Piatti et al., 2021), stadium attendance demand (Reade et al., 2020), public perceptions of sport events (Sato et al., 2020), and fans’ perspectives on professional leagues and sport events (Vegara-Ferri et al., 2020). According to Vegara-Ferri et al. (2020), more than 50% of fans strongly missed watching matches, although more than 50% of fans did not feel safe attending leagues and events. They also report
differences in each item by age group. Moreover, if all restrictions on attending sport events were removed, approximately 50% of those who related to sport (spectators, competitors, or students) indicated their intentions to attend a sport event within one week, and many of them planned to attend with two or more people (Perić et al., 2021). As described previously, although there has been an accumulation of some research on opinions regarding attending sport games, little research has been conducted on the worries and attitudes of spectators who actually attended sport games. Barber and Kim (2020) report that older people have lower worries about COVID-19 than younger people, and that behavior changes in response to COVID-19 are also lower. It has also been pointed out that younger people tend to be more sensitive to social distancing than older people (Vegara-Ferri et al., 2020). That is, several previous studies suggest that worries and attitudes about COVID-19 are different depending on age. While these may not be an exception for live sport spectators, a survey needs to be conducted on them to show the data. By clarifying these aspects, fundamental data can be provided for organizing future matches and events with spectators during and after the COVID-19 pandemic. Therefore, this study explores the worries and attitudes of spectators during the COVID-19 pandemic and to compare them by age group. The study focuses on volleyball spectators because the arena is an enclosed space that requires further infection prevention. In Japan, volleyball is considered to be the most frequently watched sport among ball games following baseball and football, which are sports that are played outside (Macromill, 2020). Moreover, the International Volleyball Federation consists of 222 member federations (International Volleyball Federation, 2019). Since it is a globally popular sport, the results of the survey on volleyball spectators can easily be applied to future countermeasures during the COVID-19 pandemic with indoor sport including volleyball around the world.
2. Methods

2.1. Procedures and Sample Characteristics

The team targeted for this study was Victorina Himeji, which was launched in 2016 as the first professional women’s volleyball club in Japan. Himeji City, where the team is based, is in Hyogo prefecture in the Kansai area. The city has approximately 500,000 residents, and the total area is approximately 500 km². Victorina Himeji is currently active in Division 1 of the Japanese Volleyball League. The survey was conducted with spectators at Victorina Himeji’s home match on February 6, 2021. In the three days prior to the match, the number of people infected with COVID-19 was confirmed to be around 100 per day in Hyogo Prefecture (i.e., From February 3 to 5, the numbers were 120, 111, and 96, respectively) (Hyogo Prefecture, 2021). On the day of the match, the maximum number of spectators was limited to 50% of the arena’s capacity due to the COVID-19 pandemic. According to the V. League reports (Japan Volleyball League Organization, 2020; 2021), while the average number of spectators were more than 3,000 last year (i.e., 2019-2020 season), there were 780 spectators on the match day. Japan Volleyball League Organization (2021) implemented a variety of infection prevention and control in the arena. For example, the distance between seats was kept at least one seat apart to ensure the physical distancing of spectators. In addition, spectators were required to take their temperature and sanitize their hands before entering the arena. They also had to wear masks and were not allowed to cheer by shouting or high-fiving. Before the match began, a questionnaire was placed on each seat and was collected at each seat after the match. The respondents were informed that their personal information would not be identified as they would complete the questionnaire anonymously and that their participation in the survey would be voluntary. Moreover, the purpose of the survey was explained with the assurance that the obtained data would not be used for any purpose other than this survey. Although 223 responses were returned, six were eliminated since many items were left blank. Thus,
217 responses were regarded as usable. Of the sample, 74.1% of the respondents were male (female = 25.9%), and their average age was 49.6 years old (SD = 13.9). In the previous year’s (i.e., 2019) survey (Kobe Shinwa Women’s University, 2020), the sample was 50.0% male, with an average age of 39.7 years old (SD = 17.6). This suggests that the ratio of males and the average age of the spectators increased.

2.2. Measurement Scale

The variable for spectators’ worries about watching a match in the arena, which was modified from the questionnaire by Waseda University (2020), was assessed with seven items (e.g., “Gathering crowds of people in the arena”). The items were anchored with scores ranging from 1 (not worried) to 5 (worried). The variable for spectators’ attitudes regarding the COVID-19 pandemic consisted of seven items (e.g., “I would still support my team even if there were no fans in the arena”), which was modified from the questionnaire by Innovation Institute for Fan Experience (2020). Respondents were asked to rate the extent to which they agreed with each survey item on a scale ranging from 1 (disagree) to 5 (agree).

2.3. Data Analysis

First, the mean scores and standard deviation of each item were calculated to examine the characteristics of spectators’ worries and attitudes. Second, we conducted a multivariate analysis of variance (MANOVA) and a follow-up analysis of variance (ANOVA) with the Tukey multiple comparison test to examine the mean difference of each variable among the age groups. In past research, three groups (i.e., young people, middle-aged people, and older people) are often compared (Yeung and Fung, 2007; Vegara-Ferri et al., 2020). Thus, considering the population demographic of Japan and based on the classification by Cabinet Office (2015), the respondents
were categorized by age into young people (aged younger than 34 years; \( n = 33 \)), middle-aged people (aged 35 - 64 years; \( n = 139 \)), and older people (aged older than 65 years; \( n = 45 \)). The effect size of \( \eta^2 \) is considered to be small when \( \eta^2 = .01 \), medium when \( \eta^2 = .06 \), and large when \( \eta^2 = .14 \) (Cohen, 1988). The data were analyzed utilizing IBM SPSS Statistics 24.

3. Results and Discussion

3.1. Means, Standard Deviations, and Analyses of Variance

First, the mean of each variable regarding worries and attitudes was compared by spectators’ age. For spectators’ worries (see Table 1), the variables with the highest levels were those directly related to other attendees and the three Cs (i.e., crowded places, close-contact settings, and confined and enclosed spaces), which were proposed by World Health Organization (2020) and include “Gathering crowds of people in the arena” and “Possibility that someone in the arena is infected with COVID-19.” This result suggests the importance of practicing social distancing in the arena and measuring attendees’ body temperature before they enter the arena. However, the values for “Touching the seat” and “Infection prevention and control in the arena” were low, indicating that the spectators were not overly worried about the infection prevention performed by the team and arena. Perić et al. (2021) report that sanitizing seats, performing infection prevention, and controlling facilities were highly important safety measures for spectators when attending sport events. The arena and the volleyball club researched in this study had taken proper measures to manage these issues, and the spectators’ related low values of worry may have led them to watch the match in the arena.

For spectators’ attitudes (see Table 2), the variables such as “I would still support my team even if there were no fans in the arena,” “I am satisfied with the services provided by the current team or the arena,” and “I am satisfied with the infection prevention and control in the arena today”
received high scores, while “I was wondering whether to watch the match in the arena because I was worried that I might become infected with COVID-19” earned low scores. This result suggests that many spectators sincerely support the team and want to watch the matches in the arena even during the COVID-19 pandemic. Reade et al. (2020), examining data from early 2020 in the Belarusian football league, state that fans are likely to return as soon as the European football leagues restart. Perić et al. (2021), who conducted a study in Croatia, Slovenia, and Iran, report a similar conclusion. The results of this study empirically support their findings. Further, there was a tendency that only a few spectators utilized social networking services to interact with other fans during the COVID-19 pandemic. As Majumdar and Naha (2020) and Mastromartino et al. (2020) note, fans’ activities in stadiums and arenas have been limited during the COVID-19 pandemic. Yoshida et al. (2021) find that the connections among fans have a significant impact on fans’ continued support for their team using the concept “fan community identification.” However, it is not clear whether the use of social networking services is useful in fostering connections among fans during the COVID-19 pandemic. Therefore, practitioners and researchers must explore in detail how fans interact with fandom outside of stadiums and arenas. If social networking services are shown to be useful in facilitating connections among fans, the team should be actively marketed using them.

Second, a MANOVA was conducted for spectators’ worries and attitudes to clarify specific differences across the age groups. While spectators’ worries revealed significant differences among the age groups ($F(14, 370) = 2.75, p < .01; \text{Wilk’s } \Lambda = 0.82, \text{partial } \eta^2 = .09$), spectators’ attitudes did not reveal significant differences among the age groups ($F(14, 358) = 1.12, p = .34; \text{Wilk’s } \Lambda = 0.92, \text{partial } \eta^2 = .04$). Thus, a follow-up ANOVA was conducted only on spectators’ worries. Table 1 reports the mean, standard deviation, and results of the follow-up ANOVA for each variable of spectators’ worries. The ANOVA was significant only for “Spectators coming from other
prefectures” and “Touching the seat.” The three groups were compared utilizing Tukey’s honestly significant difference test to further investigate these two items’ differences. The analyses indicated that young people were more worried than middle-aged people and older people about “Spectators coming from other prefectures.” Regarding “Touching the seat,” young people were more worried than middle-aged people. According to the criteria of the effect size, the \( \eta^2 \) values reported in this study indicated a small to medium effect size, ranging from .01 to .05. In a previous study that compared three similarly aged groups (one group younger than 25 years old, one group between 25 and 40 years old, and one group over 40 years old), findings indicate that the group younger than 25 years old was most sensitive to social distancing, and the group between 25 and 40 years old was most insecure about attending sport leagues and events (Vegara-Ferri et al., 2020). Although it has been confirmed that hospitalized cases requiring critical care and the infection-fatality ratio increase with elderly age (Ferguson et al., 2020), this study indicates that young people who watched the match in the arena were more worried about infection than other age groups. Similar results have been reported in fields outside of sport. Older people (especially older men) were less worried about COVID-19 than other age groups and considered themselves less likely to acquire COVID-19 (Barber and Kim, 2021; Bruine de Bruin, 2021). Furthermore, compared to other age groups, older people had fewer behavioral changes (e.g., wearing a mask) associated with COVID-19 (Barber and Kim, 2021) as well as lower levels of depression and anxiety during the COVID-19 pandemic (Bruine de Bruin, 2021). This may be because young people are more likely to be active emotionally than older people when faced with a crisis, and older people are relatively more experienced in controlling their emotions and reducing stress (Bruine de Bruin, 2021; Yeung and Fung, 2007).

(Insert Table 1 around here)
4. Conclusions

In conclusion, findings revealed that spectators visiting the arena had significant levels of worry related to other attendees (e.g., “Gathering crowds of people in the arena” and “Possibility that someone in the arena is infected with COVID-19”). However, they were less worried about the infection prevention measures taken by the team and arena and were more satisfied with these aspects, suggesting that they were connected to visiting the arena. Reade and Singleton (2020) note that due to the COVID-19 pandemic, managers must be innovative and creative in their strategies to hold matches with various restrictions. In this regard, as demonstrated in this study, spectators have a strong commitment to support their teams; therefore, they are more likely to visit stadiums and arenas if facilities and teams provide appropriate infection prevention and control. Strategies based on age and other personal attributes may also be necessary.

However, several limitations apply in this study. First, the sample size was small due to the limited number of spectators allowed into the arena. In the future, a larger sized survey should be conducted to examine comparisons or relationships based on personal demographics, sport types, or countries. Second, we were not able to examine in detail the items related to worries and attitudes. When the questionnaire was being developed, there was little accumulation of previous studies. Further accumulation of empirical studies is required to examine in detail the live spectators’ attitudes, mentalities, and behaviors during the COVID-19 pandemic. For example, tourism research has indicated that emotional worry and fear may inhibit travel behavior during the COVID-19 pandemic (Bae and Chang, 2020). It may also be important to examine the relationship between the quality of infection control measures in stadiums, arenas, and professional sport teams and spectator behaviors. Theoretical examination of spectators’ behaviors during the
COVID-19 pandemic can bring more detailed practical implications related to strategies of professional sport teams. Finally, we hope that additional spectator research will be conducted in a variety of sports and contexts and that people will be able to attend stadiums and arenas safely during and after the COVID-19 pandemic.

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Table 1: *Age Differences in Spectators’ Worries about COVID-19 Infection in the Arena*

| Variables                                      | Entire sample $M \pm SD$ | Young people $M \pm SD$ | Middle-aged people $M \pm SD$ | Older people $M \pm SD$ | $F(p)$ | $\eta^2$ | Tukey’s honestly significant difference |
|------------------------------------------------|---------------------------|--------------------------|-------------------------------|--------------------------|---------|---------|----------------------------------------|
| Gathering crowds of people in the arena        | 3.60 ± 1.16               | 3.58 ± 1.20              | 3.60 ± 1.16                   | 3.73 ± 1.21              | 0.67    | .01     |                                                       |
| Possibility that someone in the arena is infected with COVID-19 | 3.59 ± 1.15               | 3.88 ± 1.11              | 3.58 ± 1.15                   | 3.31 ± 1.18              | 2.33    | .02     |                                                       |
| Cheering behavior of spectators                | 3.30 ± 1.24               | 3.24 ± 1.25              | 3.37 ± 1.23                   | 3.06 ± 1.26              | 0.55    | .01     |                                                       |
| Waiting in a long line-up                      | 3.20 ± 1.21               | 3.31 ± 1.33              | 3.28 ± 1.17                   | 2.77 ± 1.23              | 2.66    | .03     |                                                       |
| Spectators coming from other prefectures       | 3.03 ± 1.24               | 3.58 ± 1.12              | 2.95 ± 1.24                   | 2.82 ± 1.26              | 5.29**  | .05     | Young people > Middle-aged people **         |
|                                                  |                           |                          |                               |                          |         |         | Young people > Older people *                    |
| Touching the seat                              | 2.92 ± 1.26               | 3.45 ± 1.25              | 2.80 ± 1.23                   | 2.90 ± 1.27              | 4.54*   | .05     | Young people > Middle-aged people **         |
| Infection prevention and control in the arena  | 2.78 ± 1.23               | 2.91 ± 1.23              | 2.76 ± 1.21                   | 2.72 ± 1.33              | 0.61    | .01     |                                                       |

*Note:* *p < .05; **p < .01
Table 2: Age Differences in Spectators’ Attitudes during the COVID-19 Pandemic

| Variables                                                                 | Entire sample | Young people | Middle-aged people | Older people |
|--------------------------------------------------------------------------|---------------|---------------|--------------------|--------------|
|                                                                          | M ± SD        | M ± SD        | M ± SD             | M ± SD       |
| I would still support my team even if there are no fans in the arena.    | 4.33 ± 0.87   | 4.21 ± 0.89   | 4.36 ± 0.91        | 4.32 ± 0.65  |
| I am satisfied with the services provided by the current team or the arena. | 4.33 ± 0.75   | 4.33 ± 0.74   | 4.34 ± 0.76        | 4.27 ± 0.69  |
| I am satisfied with the infection prevention and control in the arena today. | 4.10 ± 0.73   | 3.97 ± 0.73   | 4.12 ± 0.76        | 4.16 ± 0.58  |
| I want a specific social media platform to engage with my team and players. | 3.42 ± 1.19   | 3.70 ± 1.08   | 3.46 ± 1.19        | 2.90 ± 1.19  |
| I am frustrated that there were limited opportunities to connect and interact with my team and players during the COVID-19 pandemic. | 3.18 ± 1.26   | 3.03 ± 1.29   | 3.24 ± 1.25        | 3.07 ± 1.31  |
| I was wondering whether to watch the match in the arena because I was worried that I might be infected with COVID-19. | 2.54 ± 1.28   | 2.88 ± 1.24   | 2.52 ± 1.30        | 2.29 ± 1.22  |
| I use social networking services to interact with other fans during the COVID-19 pandemic. | 2.54 ± 1.23   | 2.70 ± 1.26   | 2.60 ± 1.23        | 2.10 ± 1.13  |
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