

Belief in just deserts regarding individuals infected with COVID-19 in Japan and its associations with demographic factors and infection-related and socio-psychological characteristics: A cross-sectional study (#76243)

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Belief in just deserts regarding individuals infected with COVID-19 in Japan and its associations with demographic factors and infection-related and socio-psychological characteristics: A cross-sectional study

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Prejudice related to the coronavirus disease 2019 (COVID-19) is a social issue worldwide. A possible psychological factor that promotes prejudice is the belief in just deserts (BJD) regarding individuals infected with COVID-19 (i.e., the belief that the infected individual deserves to be infected). The BJD is based on the belief in immanent justice. It is reportedly higher in Japan than in other countries. Therefore, we conducted a cross-sectional study to investigate the BJD among Japanese individuals and clarified its associations with demographic factors and infection-related and socio-psychological characteristics. To this end, we conducted an online questionnaire survey in Japan in August 7–8, 2020, with 1,207 respondents aged 20–69 years. We performed screening to exclude inappropriate responses. We investigated the association between the BJD and demographic factors such as gender and age. We also investigated the association between the BJD and infection-related and socio-psychological characteristics, including risk perception of COVID-19 infection and human rights restrictions (i.e., degree of agreement with government restrictions on individuals' behavior during emergencies). Among the surveyed items, human rights restrictions showed a strong association with BJD, followed by risk perception of COVID-19 infection. Our findings implied that public sharing of a high level of tolerance may help alleviate the BJD; conversely, alleviating the BJD may help reduce discrimination through mitigation in agreement with human rights restrictions. Our study is significant in that it is the first to investigate the items associated with the BJD, thereby providing foundational information for solving prejudice-related issues during COVID-19.

Belief in just deserts regarding individuals infected with COVID-19 in Japan and its associations with demographic factors and infection-related and socio-psychological characteristics: A cross-sectional study

Short title:

Belief in just deserts of COVID-19

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21 **Abstract**

22 Prejudice related to the coronavirus disease 2019 (COVID-19) is a social issue worldwide. A
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the BJD; conversely, alleviating the BJD may help reduce discrimination through mitigation in agreement with human rights restrictions. Our study is significant in that it is the first to investigate the items associated with the BJD, thereby providing foundational information for solving prejudice-related issues during COVID-19.

Keywords

Belief in just deserts; Belief in a just world; COVID-19; Human rights restrictions; Prejudice; Risk perception

1. Introduction

Following the coronavirus disease 2019 (COVID-19) outbreak, discrimination related to COVID-19 infection has become a social issue worldwide (Devakumar et al., 2020; He et al., 2020). In addition to discrimination against infected individuals, stigma and prejudice related to race and occupation have also arisen (Bhanot et al., 2021; Lu et al., 2021). High depressive, anxiety, and post-traumatic stress disorder symptoms have been observed among individuals affected by discrimination (González-Sanguino et al., 2020).

54 One of the possible psychological factors that promote discrimination, stigma, and prejudice is
 55 the belief in just deserts (BJD) regarding individuals infected with COVID-19. The BJD is the
 56 belief that the infected person deserves to be infected. It is based on the belief in immanent
 57 justice (BIJ), which is one of the subscales of the belief in a just world (BJW). The BJW is the
 58 belief that individuals live in a just world where they get what they deserve and deserve what
 59 they get (Lerner, 1980)). The BIJ represents “the tendency to perceive or see justice in the events
 60 that have occurred,” whereas the belief in ultimate justice, which is a sub-measure of the BJW,
 61 represents “the tendency to believe that forthcoming events will settle any injustice that occurs”
 62 (Maes, 1998). While the belief is not necessarily bad, the BIJ tends to attribute the cause of harm
 63 to the victim (Maes, 1998) and inflicts severe punishment on the perpetrator (Murayama &
 64 Miura, 2015). Significantly, since COVID-19 is an infectious disease, infected individuals are
 65 liable to infect other individuals. Therefore, understanding the characteristics of BJD regarding
 66 individuals infected with COVID-19 is important to address the issues of discrimination, stigma,
 67 and prejudice related to COVID-19. In this regard, a survey conducted in March–April 2020
 68 including individuals from Japan, the United States, the United Kingdom, Italy, and China
 69 reported a high BJD score among Japanese individuals compared to individuals from other
 70 countries (Miura, Hiraishi & Nakanishi, 2020). This is consistent with another finding that the
 71 Japanese are more likely to engage in immanent justice reasoning than Americans (Murayama,

Miura & Furutani, 2021). However, to the best of our knowledge, no study has investigated how demographic factors or infection-related and socio-psychological characteristics are associated with the BJD.

Therefore, in this study, we investigated the BJD regarding individuals infected with COVID-19 among Japanese individuals. We explored its associations with demographic factors and infection-related and socio-psychological characteristics. Among infection-related and socio-psychological characteristics, we considered the history of COVID-19 infection, infection rate, risk perception (i.e., perceived prediction of probability that the average Japanese individual will be infected with COVID-19 within the next nine months), and human rights restrictions (i.e., agreeing with the government-imposed restriction of individuals' behavior during emergencies). We surveyed the history of infection, infection rate, and risk perception because we considered that if respondents perceived infection as a common event, they would not think that infected individuals deserve to be infected. Risk perception of COVID-19 is associated with infection prevention behavior (Dryhurst et al., 2020). Those who have higher demands for infection prevention behaviors toward others possibly believe that individuals infected with COVID-19 get what they deserve. We included human rights restrictions in our study because extremely strict social norms (or a low level of tolerance) (Gelfand et al., 2011) are likely to be associated with the BJD. In countries, such as Japan and the United States, networks of citizens called "self-

restraint police” or “groups of local vigilantes” have sought or enforced strict restrictions on other citizens’ behavior related to the opening of restaurants and entertainment establishments and traveling long distances (Denyer & Kashiwagi, 2020; Ortiz, 2020; Wright, 2021). Further, authoritative individuals have an increased likelihood of making punitive judgments (Lerner, Goldberg & Tetlock, 1998); therefore, we hypothesized that people with high human rights restrictions are likely to demonstrate authoritarian tendencies and attribute the cause of the infection to the infected individuals themselves.

2. Methods

2.1. Ethics

The Osaka University Graduate School of Human Sciences Research Ethics Committee approved our study (Approval No. HB022–007). We obtained respondents’ consent before conducting the study.

2.2. Study design and subjects

Our study design was cross-sectional. We asked a company called LSa to obtain responses via an online questionnaire survey with respondents between the ages of 20 and 69 from a panel provider, Marketing Applications, Inc. Marketing Applications, Inc. is one of the largest panel

108 providers in Japan with approximately 3.5 million registered panels (as of March 2021). First, we
 109 conducted a screening survey in August 6–7, 2020, including 7,221 respondents. In this survey,
 110 we set up an instructional manipulation check (Miura & Kobayashi, 2019) to detect inattentive
 111 respondents. If the respondents did not answer the questions correctly the first time, we gave
 112 them a warning and asked them to read the questions carefully. If they did not answer the
 113 questions correctly even the second time, we removed them from the survey. After the screening,
 114 we found 4,553 inappropriate responses (63.1%). This rate was similar to that reported in a
 115 previous study (Miura & Kobayashi, 2015). In the main survey, we included 2,668 respondents
 116 by excluding inattentive respondents to enhance the result reliability. Then, we set a target
 117 number for each gender and age group according to Japan’s population distribution and
 118 terminated the survey upon reaching the target number. Therefore, the final number of
 119 respondents was 1,207. The respondents received points that could be redeemed for products. As
 120 described below (see “Survey items”), the BJD consists of two items. The crude results for the
 121 item “I think anyone who gets infected with the Coronavirus (COVID-19) got what they
 122 deserved,” have already been reported in another study (Miura, Hiraishi & Nakanishi, 2020).
 123 In this regard, it must be mentioned that the World Health Organization declared COVID-19 as a
 124 Public Health Emergency of International Concern on January 30, 2020, and a pandemic on
 125 March 11, 2020 (Cucinotta & Vanelli, 2020). In Japan, an official statement was issued to

declare a state of emergency in seven prefectures on April 7, 2020, after two voluntary stay-at-home requests on February 26, 2020, and March 10, 2020. The state of emergency was extended to include all prefectures on April 16, 2020. Then, it was reduced to eight and five prefectures on May 14, 2020, and May 21, 2020, respectively, before being completely lifted on May 25, 2020. By August 7, 2020 (the start date of the main survey), the total number of confirmed COVID-19 cases in Japan was 45,318 (Ministry of Health Labour and Welfare, 2022).

2.3. Survey items

The BJD comprised two items: “I think anyone who gets infected with the Coronavirus (COVID-19) got what they deserved,” and “If anyone had been infected with the Coronavirus (COVID-19), I think it was their fault.” For each item, respondents could choose from various options ranging from “Strongly Disagree (1)” to “Strongly Agree (6)”.

We considered gender, age, the region of residence (eight regions), the population density of residence, educational background, occupation, marital status, and presence or absence of children as demographic factors in the survey. For population density, we used the values for the respondents’ prefecture of residence (as of January 1, 2020) (e-Stat, 2021; Geospatial Information Authority of Japan, 2020). Further, we asked respondents about their educational

143 background. All items other than educational background were based on information from the
144 monitor registry.

145 We considered the presence or absence of COVID-19 infection in respondents or respondents'
146 surroundings (history of infection), COVID-19 infection rate in respondents' residence, risk
147 perception of COVID-19 infection (Yamagata, Teraguchi & Miura, 2021), and human rights
148 restrictions as infection-related and socio-psychological characteristics. As for the infection rate,
149 we considered the total number of confirmed COVID-19 cases per 100,000 individuals in the
150 respondents' prefecture until or on August 7, 2020 (e-Stat, 2021; Ministry of Health Labour and
151 Welfare, 2022). For other items, we asked respondents to respond to the questionnaire. We
152 assessed risk perception by asking respondents about their perceived probability that the average
153 Japanese individual would be infected with COVID-19 by April 30, 2021; the respondents chose
154 a number from improbable (0) to certain (100). We considered six items to measure perceptions
155 regarding human rights restrictions during emergencies: "In emergencies, it is better to follow
156 government requests for restrictions on freedom of movement," "In emergencies, speech
157 contrary to government policy should be punished by law," "In emergencies, anyone who goes
158 out against government lockdown policy should be punished by law," "In emergencies, every
159 citizen can autonomously take action to ensure that government policies are respected," "In
160 emergencies, it is better to follow government requests for restrictions on freedom of speech,"

161 and “In emergencies, every citizen should watch over to ensure that government policies are
162 respected.” The responses ranged from “Strongly Disagree (1)” to “Strongly Agree (7).”

163

164 2.4. Statistical analysis

165 We performed the Spearman–Brown coefficient (Eisinga, Grotenhuis & Pelzer, 2013; Hulin et
166 al., 2001) and Cronbach’s α of the BJD. Both were high enough at 0.898, so we used the

167 arithmetic mean of the two items (range: 1–6). The human rights restrictions showed one factor

168 extracted in the factor (maximum likelihood method) and parallel analyses (Hori, 2001), with

169 Cronbach’s α of 0.794. This value was also sufficiently high, so we used the arithmetic mean of

170 the six items (range: 1–7). We used logarithmic values for population density and infection rates.

171 First, we compared the BJD to the theoretical median (3.5) by performing a one-sample t-test.

172 Next, we performed univariate analysis to examine associations with the BJD; we performed t-

173 tests for two groups, analysis of variance (ANOVA) for three or more groups, and Pearson’s

174 correlation for continuous variables. Finally, since we found gender and age to be significantly

175 associated with the BJD, we considered other items with $P \leq 0.05$ in the univariate analysis

176 variables in partial correlation analysis by using gender and age as control variables. We created

177 dummy variables for categorical variables. We applied a Bootstrap method (10,000 samples) to

178 estimate a 95% confidence interval (CI).

179 We used IBM SPSS 28 in this study.

180

181 **3. Results**

182 The arithmetic means (standard deviation; SD) of the single-question items, “I think anyone who
183 gets infected with the Coronavirus (COVID-19) got what they deserved” and “If anyone had
184 been infected with the Coronavirus (COVID-19), I think it was their fault” were 2.46 (1.19) and
185 2.54 (1.20), respectively. The average value of the two items (BJD) was 2.50 (1.14) (Table 1).

186 This value was significantly lower than that of the theoretical median ($P < 0.001$, Cohen’s $d =$
187 -0.879 (95% CI: -0.946 — -0.813)).

188 Univariate analysis showed that among demographic factors, the BJD was significantly lower
189 among women than among men (Table 1). Further, it was lower among married individuals than
190 among unmarried individuals and among those with children than among those without children.

191 It also decreased with increasing age. However, no significant association existed between the
192 region of residence, population density, educational background, or occupation and the BJD.

193 Among infection-related and socio-psychological characteristics, the BJD was negatively
194 associated with risk perception and positively associated with human rights restrictions. As for
195 the effect size criteria ($|d| > 0.20$, $\eta^2 > 0.01$, and $|r| > 0.1$; these values had the same effect size
196 level despite the differences in their types (Cohen, 1988)), the effect size was relatively large for

human rights restrictions ($r = 0.329$ (95% CI: 0.278–0.379)) among demographic factors and infection-related and socio-psychological characteristics.

Partial correlation analysis with gender and age as control variables revealed that $|r|$ was highest for human rights restrictions, followed by risk perception (Table 2).

4. Discussion

In this study, we examined the BJD among individuals in Japan and investigated its associations with demographic factors and infection-related and socio-psychological characteristics. To this end, we conducted an online survey in August 2020. We identified the items that demonstrated the strongest association.

The BJD's arithmetic mean was much lower than the theoretical median with large effect size, confirming that few individuals believed that COVID-19 infected individuals deserved what they got.

Among demographic factors and infection-related and socio-psychological characteristics, the item most strongly associated with the BJD was human rights restrictions. This item is assessed based on the degree of agreement with government restrictions on individuals' behavior during emergencies and indicates the level of adherence to strict social norms. Although social norms positively promote infection prevention measures, such as mask-wearing, through collective

215 knowledge among populations (Nakayachi et al., 2020), this study's finding suggested that

216 excessively strict social norms (or low level of tolerance) may lead to high BJD and vice versa.

217 Further, risk perception of COVID-19 infection was weakly and negatively associated with the

218 BJD. However, no significant associations existed between the infection rate in the residence or

219 history of infection and the BJD. This suggests that perceiving COVID-19 infection as common

220 may help mitigate the BJD. Risk perception of COVID-19 infection is reportedly associated with

221 the willingness to be vaccinated (Nomura et al., 2021) and with preventive health behaviors such

222 as mask-wearing, hand washing, and physical distancing (Dryhurst et al., 2020). This study

223 provides new insight into the association between risk perception and the BJD.

224 Among demographic factors, the BJD was significantly associated with gender, age, marital

225 status, and the presence of children in the univariate analysis, whereas its association with the

226 region of residence, population density, educational background, and occupation was

227 insignificant. In particular, the difference in the BJD by gender was relatively large among these

228 items, although their effect sizes were small overall. This finding is consistent with that of a

229 previous meta-analysis (O'Connor et al., 1996) where men had a slightly higher **BJW** than

230 women (the weighted average effect size d was 0.12). The finding that men have slightly higher

231 BJD than women is probably related to their attitudes toward different groups: a previous survey

reported that Japanese men tended to show a higher degree of ethnocentrism than Japanese women after the COVID-19 outbreak (Yamagata, Teraguchi & Miura, 2021).

In this study, we focused on the BJD to better understand how discrimination, stigma, and prejudice related to COVID-19 infection can be addressed. We found that the BJD was most strongly associated with human rights restrictions, even after controlling for gender and age.

Public sharing of a high level of tolerance may help alleviate the BJD; conversely, alleviating the BJD may help reduce discrimination against individuals through mitigation in agreement with human rights restrictions. Our study firstly provided foundational knowledge on how COVID-19 infection-related discrimination, stigma, and prejudice can be addressed. This finding has important implications in the COVID-19 pandemic for another issue apart from the infection disease itself: improving people's wellbeing. However, it should be noted that the direction of causality between these variables is unclear. Therefore, identifying the directionality among these variables through longitudinal or interventional studies will provide foundational knowledge for addressing discrimination, stigma, and prejudice.

Our study has several limitations. First, since it is a cross-sectional study, it does not allow for causal identification. In particular, it is important to note that reverse causality may exist in the associations between human rights restrictions or risk perception and the BJD, as described above. Second, our study may have been subjected to selection bias since we conducted an

online survey. Although gender and age proportion in our survey was based on the actual distribution in Japan, respondents' educational level (48.1% belonged to a university or a graduate school) was higher than that of the average Japanese individual (19.8% among 20–69 years old in 2010 [the most recent number in the national census available]) (Statistics Bureau of Japan, 2012). Nevertheless, we found no significant association between educational background and the BJD. Moreover, since we conducted an online survey, respondents had the advantage of receiving points in the form of incentives. This meant that participation was independent of respondents' interest in the survey topic. Third, our study respondents were aged between 20 and 69 years and living in Japan. This means that the findings may not apply to other age groups and especially other countries and should be interpreted with caution. Fourth, we obtained a low $|r|$ value between 0.012 and 0.327 from the partial correlation analysis. This means that further studies must be conducted to explore the association between the BJD and other factors that have not been investigated in this study.

5. Conclusions

We investigated the association between the BJD and demographic factors and between the BJD and infection-related and socio-psychological characteristics related to COVID-19-infected individuals in Japan. Our findings were as follows:

● The BJD was much lower than the theoretical median, confirming that a small proportion of individuals in Japan believe that infected individuals deserve to be infected.

● We found a strong association between human rights restrictions and the BJD, followed by risk perception of COVID-19 infection.

● Men had slightly higher BJD than women.

● Public sharing of a high level of tolerance may help mitigate the BJD. Conversely, alleviating the BJD may help reduce discrimination through mitigation in agreement with human rights restrictions.

Our study is significant in that it provides foundational information to help mitigate the social issues of discrimination, stigma, and prejudice related to COVID-19 infection.

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Declaration of interest

None.

Supplemental files

Data of each respondent.

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379 Table caption

380 Table 1. Association between the belief in just deserts (BJD) and demographic factors and
 381 infection-related and socio-psychological characteristics: univariate analysis. N: number of
 382 respondents; SD: standard deviation; CI: confidence interval. #: t-test, analysis of variance,
 383 Pearson's correlation.

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385 Table 2. Partial correlation coefficients for the belief in just deserts (BJD). Control variables:
 386 gender and age. CI: confidence interval.

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Table 1(on next page)

Association between the belief in just deserts (BJD) and demographic factors and infection-related and socio-psychological characteristics: univariate analysis.

N: number of respondents; SD: standard deviation; CI: confidence interval. #: t-test, analysis of variance, Pearson's correlation.

Table 1. Association between the belief in just deserts (BJD) and demographic factors and infection-related and socio-psychological characteristics: univariate analysis. N: number of respondents; SD: standard deviation; CI: confidence interval. #: t-test, analysis of variance, Pearson's correlation.

	N (%) or Arithmetic mean (SD)	BJD Arithmetic mean (SD)	Effect size d^a , η^2^b , or r^c (95%CI)	$P^{\#}$
The whole participants	1,207 (100%)	2.50 (1.14)	-	-
<i>Demographic factors</i>				
Men (ref)	608 (50.4%)	2.58 (1.21)	-0.139 (-0.252--0.026) ^a	0.02
Women	599 (49.6%)	2.42 (1.05)		
Age	45.9 (13.6)	-	-0.090 (-0.146--0.034) ^c	0.002
Hokkaido region	53 (4.4%)	2.32 (1.22)	0.004 (0.000-0.007) ^b	0.67
Tohoku region	70 (5.8%)	2.47 (1.11)		
Kanto region	434 (36.0%)	2.47 (1.07)		
Chubu region	195 (16.2%)	2.64 (1.27)		
Kinki region	254 (21.0%)	2.47 (1.13)		
Chugoku region	68 (5.6%)	2.49 (1.09)		
Shikoku region	33 (2.7%)	2.48 (1.32)		
Kyushu region	100 (8.3%)	2.57 (1.12)		
log ₁₀ population density [persons//km ²]	2.95 (0.61)	-	-0.012 (-0.068-0.045) ^c	0.69
Elementary/junior high/high school	354 (29.3%)	2.54 (1.17)	0.001 (0.000-0.007) ^b	0.42
Junior/technical/professional training college	273 (22.6%)	2.42 (1.05)		
University/graduate school	580 (48.1%)	2.52 (1.15)		
Civil servants/executives/company employees	497 (41.2%)	2.57 (1.22)	0.003 (0.000-0.011) ^b	0.18
Self-employed/free enterprise	99 (8.2%)	2.46 (0.98)		
Full-time homemaker, part-time job, student, other	611 (50.6%)	2.45 (1.09)		
Unmarried individuals (ref)	524 (43.4%)	2.58 (1.20)	-0.124 (-0.237--0.010) ^a	0.04
Married individuals	683 (56.6%)	2.44 (1.08)		
Absence of children (ref)	621 (51.4%)	2.57 (1.18)	-0.120 (-0.233--0.007) ^a	0.04
Presence of children	586 (48.6%)	2.43 (1.09)		
<i>Infection-related and socio-psychological characteristics</i>				
History of infection: absence (ref)	1163 (96.4%)	2.50 (1.13)	0.103 (-0.198-0.404) ^a	0.50
History of infection: presence	44 (3.6%)	2.61 (1.28)		
log ₁₀ infection rate [10 ⁻⁵]	1.43 (0.42)	-	-0.011 (-0.067-0.045) ^c	0.70
Risk perception	33.7 (24.1)	-	-0.056 (-0.112-0.000) ^c	0.05

Human rights restrictions	3.35 (1.15)	-	0.329 (0.278–0.379) ^c	<0.001
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Table 2(on next page)

Partial correlation coefficients for the belief in just deserts (BJD).

Control variables: gender and age. CI: confidence interval.

1 Table 2. Partial correlation coefficients for the belief in just deserts (BJD). Control variables:

2 gender and age. CI: confidence interval.

	<i>r</i> (95%CI)	<i>P</i>
Married individuals (ref: unmarried individuals)	−0.015 (−0.073–0.044)	0.61
Presence of children (ref: absence of children)	−0.012 (−0.070–0.046)	0.68
Risk perception	−0.063 (−0.120–−0.006)	0.03
Human rights restrictions	0.327 (0.266–0.386)	< 0.001

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