

Original Research



Comparison of participant and non-participant perceptions on healthy restaurant for sodium reduction: a qualitative study

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ABSTRACT

BACKGROUND/OBJECTIVES: In the Republic of Korea, “Healthy Restaurant for Sodium Reduction (HRSR)” project have been designated as one of the representative policies for sodium intake reduction. However, as of 2021, only 879 restaurants, less than 0.1% of all restaurants, had been designated. Therefore, to increase the participation of restaurants in this policy, it is necessary to examine the in-depth perception and experience of participants and non-participants in the HRSR.

MATERIALS/METHODS: Two focus group discussions were conducted for HRSR project participants and non-participants.

RESULTS: A total of 260 semantic units were derived from the 2 groups. The units were further classified into 5 upper categories and 11 subcategories. All the study participants knew the importance of low sodium intake, but they had little information on HRSR project. Various attempts have been made to encourage low sodium practice in restaurants, and the participants reported that the amount of salt used in their restaurants currently is reduced compared to that used in the past. However, they were worried about customers’ complaints about the low sodium in their diet and the insignificant benefit associated with the policy, which makes restaurant owners reluctant to participate in this policy. All the participants agreed on the urgent need for the improvement of public awareness of low-sodium diets and for substantive government support for HRSR.

CONCLUSION: This study concluded that strategies such as more active publicity for the practice of sodium reduction in restaurants, identification of approaches to dispel the perception that low-salt diet is not tasty, and development of plans to increase the sale of food in of HRSR, are needed.

Keywords: Diet, sodium-restricted; health behavior; health promotion; focus groups

INTRODUCTION

There are concerns that high sodium intake does not only increase the risk of cardiovascular diseases [1,2] such as hypertension and diabetes, but it is also associated with the risk of

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Conflict of Interest

The authors declare no potential conflicts of interests.

Author Contributions

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various diseases such as gastric cancer and Alzheimer's disease [3-5]. Accordingly, the World Health Organization (WHO) has recommended that the sodium intake for adults should be less than 2,000 mg/day [6]. However, as of 2010, the global average sodium intake was almost double the amount recommended by the WHO [7]. In 2013, the WHO declared the goal of a 30% reduction in the average sodium intake of the population by 2025 as one of the strategies to reduce premature deaths from non-communicable diseases [6].

Globally, countries are implementing various strategies to reduce sodium intake [8]. They are simultaneously implementing multicomponent measures, such as interventions in settings, food reformulation, consumer education, and front-of-pack labeling to reduce sodium intake [8]. In Republic of Korea (hereinafter Korea), the National Plan to Reduce Sodium Intake, a comprehensive measure to address the effects of high sodium intake, has been implemented since 2012 [9]. The plan includes monitoring sodium intake through the Korea National Health and Nutrition Examination Survey as well as a variety of strategies, including a campaigning for low-sodium diets, increasing the availability of low-sodium diets in schools and workplaces, and implementing sodium reduction measures for restaurant businesses [9].

These strategies seem to be effective as sodium intake in Korea is gradually decreasing. Specifically, the daily sodium intake of Koreans decreased from 4,789 mg/day in 2010 to 3,286 mg/day in 2019 [10]. However, this amount still exceeds the daily sodium intake recommended by the WHO, and strategies to reduce sodium intake need to be strengthened. Considering that the sodium intake at restaurants is higher than that at home, rate of eating out is gradually increasing, and consumption of delivery foods is gradually increasing due to the coronavirus disease 2019 (COVID-19) [10-13], it is necessary to further strengthen strategies to reduce sodium in foods served at restaurants to further reduce the sodium intake of South Koreans.

A representative policy implemented to reduce sodium in restaurants in Korea is the "Healthy Restaurant for Sodium Reduction (HRSR)" project, which is managed by the Ministry of Food and Drug Safety [14]. In Korea, restaurants that provide menus containing less than 1,300 mg of sodium per serving or menus with 30% reduced sodium in more than 20% of their entire menu operate and are designated as HRSR [15]. HRSR have successfully reduced the sodium content of foods on their menus, and both the restaurant owners and employees and their customers have expressed satisfaction with the sodium reduction menus [16,17]. However, as of 2021, there were 879 restaurants, accounting for only 0.1% of all restaurants in Korea, that had been designated as HRSR. To increase the effectiveness of the policy, it is necessary to expand the number of restaurants that participate in the HRSR project [18].

Furthermore, to promote the HRSR project, it is crucial to not only assess the in-depth opinions of restaurant owners who participate in the project but also assess the perceptions of restaurant owners who do not participate in the project. However, there has been a scarcity of research on restaurants that participate and no research on restaurants that do not participate in the HRSR project. Therefore, this qualitative study aimed to conduct an in-depth examination of the perceptions and experiences toward the HRSR project among restaurant owners who participate and do not participate in the project.

MATERIALS AND METHODS

Because prior research on the HRSR project was lacking and it was necessary to confirm an in-depth opinion on the HRSR project, a qualitative research methodology was applied in this study. Specifically, 2 face-to-face focus group discussions for participants and non-participants in the HRSR project were organized. The focus group discussions were aimed at collecting in-depth opinions on the awareness of the HRSR project, project participation experiences, sodium use experiences of participants and non-participants in the project, and ways to promote the project. This study was approved by the Institutional Review Board of Ulsan University Hospital (IRB No.: 2022-01-028). The details of this study have been described below in accordance with the “Consolidated Criteria for Reporting Qualitative Studies”, the reporting guidelines for qualitative research [19].

Research team

The research team consisted of four investigators including one preventive medicine specialist and three preventive medicine researchers. Except one investigator (with a master’s degree in public health), all the research team members were experienced in qualitative research methodology and research writing, with abundant experience in qualitative research through regular participation in lectures and seminars related to qualitative research.

Participants

Participants were divided into two groups based on their status of participation in the project. The first group consisted of six restaurant owners who participated in the HRSR project. To recruit participants in this first group, the investigators made random calls to general restaurants among the list of restaurants designated as HRSR project on the websites of 5 gu (in Korean “구”) or gun (in Korean “군”) in Ulsan Metropolitan City. After that, the investigators directly explained the study to the restaurant owners, and those who agreed to participate were finally selected. The second group consisted of 6 restaurant owners who were not participants in the HRSR project. To recruit participants in this second group, the investigators made random calls to general restaurants among the list of restaurants designated as “Good Restaurants (GR)” on the Ulsan Metropolitan City website. The investigators directly explained the study to the restaurant owners, and those who agreed to participate were finally selected into the group. In the process of recruiting study participants, no participants declined or dropped out of the study.

Data collection methods and procedures

Prior to participating in the focus group discussion, the purpose and content of the study were explained in detail to the participants, and voluntary consent was obtained for participation in the study and recording of the focus group discussion. The focus group discussion was held once on December 10, 2020 for 5 participants in the participation group, and another was held on December 15, 2020 for 6 participants in the non-participation group. The discussions were held for approximately 2 hours in a quiet conference room where participants could talk comfortably. One principal investigator and another investigator moderated the focus group discussions, and one official from a specialized company was involved in transcription of the recording. Semi-structured questions about the experiences of participants or non-participants in the HRSR project were used (**Supplementary Data 1**). Semi-structured guidelines were developed through repeated discussions by researchers and review of previous studies [9,16]. Specific key interview questions included: 1) “Tell me the reasons for participating or not participating in the HRSR project”, 2) “What efforts did you

make to reduce dietary sodium in your restaurant?” and “What should be improved to expand the HRSR project?”

Analytical methods and procedures

In this study, the guidelines were used as the basis for analysis, and the verbatim transcription and field notes were analyzed using directed content analysis [20]. First, one investigator repeatedly read the transcripts of the focus group discussions to understand the meaning of the responses and experiences of the participants. Specifically, the meaningful remarks of the participants in the transcription data were coded as semantic unit memos, and primary analysis was performed to segment the data. After the primary analysis, the semantic unit memos were categorized according to the main context of the guidelines. Two researchers who participated in the focus group discussion but not in the primary analysis reviewed the categorized results. In case of any disagreement, the categories were revised after sufficient discussion.

Procedures for securing the validity of the study

To ensure the validity of the study, the four criteria, including truth value, applicability, consistency, and neutrality, suggested by Guba and Lincoln were reviewed [21]. For truth value, the results categorization table was presented to one participant in each group (2 in total) for review. The participants confirm from the review that their experiences been reported accurately. To ensure applicability, those who were not included in the study but met the selection criteria for the participants of this study (a total of 2 restaurant owners, 1 participant, and 1 non-participant in the HRSR project) were asked the discussion questions to examine whether their experiences were consistent with the research results. They said that the contents of the categorization result table were consistent with their experiences. To ensure consistency, the entire study process was described in detail. During the analysis process, it was confirmed that saturation was achieved through repeated discussions among researchers. Finally, to ensure neutrality, the investigators shared their prejudices about sodium reduction before the study begun, and they cross-checked and reviewed the research process among all the investigators with rich experience in qualitative research. In particular, the results of one investigator's analysis were reviewed by other investigators to maintain the neutrality of the analysis.

RESULTS

Characteristics of participants

In this study, 6 restaurant owners who are participants (group 1) and 6 restaurant owners who are not participants (group 2) in the HRSR project were recruited for this study. There were 5 males and 7 females. Most of the participants were in their 50s, and Korean food was the most common type of food served in their restaurants (**Table 1**).

Analysis of results

A total of 260 semantic units were obtained through the analysis. The semantic units were further grouped into 5 categories. Detailed analysis of results for each category and subcategory are presented in **Table 2**.

Table 1. Socio-demographic characteristics of participants

Group	Number of participants	Gender	Age group	Type (mainly served food)
1	1	Woman	50s	Korean food (abalone course dish)
	2	Man	60s	Japanese food (Japanese course meal)
	3	Woman	40s	Korean food (gukbap, galbi-tang)
	4	Man	50s	Korean food (bulgogi)
	5	Man	40s	Korean food (fugu dish)
	6	Man	50s	Japanese food (sashimi)
2	1	Man	60s	Chinese food (Chinese restaurant)
	2	Woman	50s	Korean food (Korean food)
	3	Woman	40s	Korean food (general Korean food)
	4	Woman	50s	Korean food (tang)
	5	Woman	50s	Korean food (tang)
	6	Woman	60s	Korean food (general Korean food)

Table 2. Structure of the analysis of results

Category	Subcategory
1. Awareness of projects related to reducing sodium	1-1. Participants and guests of the HRSR project are all aware that sodium is important for their health
	1-2. Not familiar with the HRSR project
2. Experience of participating in the HRSR project	2-1. Start participating in the HRSR project with a personal suggestion
	2-2. Not participating in the HRSR project as there does not seem to be much benefit
3. Experience of using salt in restaurants that participate or do not participate in the HRSR project	3-1. The restaurants that participate in the project used a lot of salt previously before their participation in the HRSR project
	3-2. Even the restaurants that do not participate in the project use less salt than that did previously
4. Experience of salt reduction in restaurants that participate or do not participate in the HRSR project	4-1. Considering the use of more salt as customers complain about the taste of the food
	4-2. Adopting various approaches to reduce the amount of sodium in diets
	4-3. No apparent changes in sales observed after participating in the project
5. Areas to focus on to promote the HRSR project	5-1. A change in the perception of sodium is required in Korea
	5-2. Practical support, not just bureaucracy, is required

HRSR, Healthy Restaurant for Sodium Reduction.

Awareness of projects related to reducing sodium

1. Participants and guests of the HRSR project are all aware that sodium is important for their health

All participants, regardless of whether they participated or did not participate in the project, were fully aware that excessive sodium intake was unhealthy and that low sodium was important for health. The participants felt that customers also knew that they should not eat salty food; however, they observed that younger people craved strong flavors, whereas older people preferred low-salt foods.

“Younger people like strong flavors. They like to have sweet and salty food or spicy and salty food.” (Participant 5, Group 1)

“Considering that nine out of ten people do not complain, the customers these days seem to understand that eating salty food is not good.” (Participant 3, Group 2)

“Low-salt diet is thought to be the most important part of your diet. I'm also working hard to reduce sodium with food in that part.” (Participant 6, Group 1)

2. Not familiar with the HRSR project

Both those who participated in the HRSR project and those who did not have heard of the HRSR project through the introduction of the competent official and the promotion

of the event in many cases. However, it was difficult to see that most of the participants knew the details of the project well. Also, hearing about the project did not directly lead to participation in the project.

“The sanitation department of the gu office performed a bunch of projects like good food practice and so on. When the sanitation department talked about the sodium-related project, I decided to participate.” (Participant 3, Group 1)

“When the sanitation department of Nam-gu Office was doing their work, they frequently mentioned sodium restaurants. However, I decided not to participate in it.” (Participant 2, Group 2)

Experience of participating in the HRSR project

1. Start participating in the HRSR project with a personal suggestion

As stated earlier, most of the participants who participate in the HRSR project did so after personal suggestion by the officials of the gu office or their acquaintances. Specifically, one participant decided to participate in the HRSR project after recommended by the ward (gu) office and thinking about it for several days. Another participant was forced to participate in the HRSR project at the recommendation of a regular customer and found the project quite attractive and continued participating in it.

“The local business branch and the restaurant were matched over the sodium-related issue, and Ulsan-si urged me to participate in the project. I gave it some thought for several days until I said yes.” (Participant 6, Group 1)

“I was not willing to participate in it initially. A regular customer recommended it so I had no choice but to join the project. However, when I began engaging in it, I found it rather attractive and became more ambitious to develop these menus.” (Participant 4, Group 1)

2. Not participating in the HRSR project as there does not seem to be much benefit

Most of the participants who did not participate in the HRSR project did not have a deep interest in the project. Participants complained that to survive among the numerous restaurants, they had no choice but to make food with a strong flavor. One participant had no intention of ever participating in such a project due to experiences of participating in a similar project in the past, which led to difficulties such as losing customers and handling a lot of administrative work.

“I tried to reduce the use of sodium previously, which led to reduced number of customers. There have been restaurants that have stopped making such efforts as well as restaurants that have closed down after reducing the use of sodium. The public offices do not promote it either. It seems meaningless to go to such restaurants.” (Participant 4, Group 2)

“I tried it when I was in Ulju-gun by applying for a year to reduce sodium. However, it took a lot of effort; I had to fill out something every day, and there were a lot of investigations. It was really annoying. There was no benefit from it. What good would redesignation do? I said, ‘no, thank you’ and stopped doing it.” (Participant 6, Group 2)

Experience of using salt in restaurants that participate or do not participate in the HRSR project

1. The restaurants that participate in the project used a lot of salt before their participation in the HRSR project

Most of the participants who participated in the HRSR project had developed the habit of eating less salty food even at home. However, these participants said that they previously used a lot of salt in the foods at the restaurant when they began running their business as customers found saltier food savorer and more delicious. In order to compete with franchise restaurants, they said they had no choice but to force the seasoning of the food.

“In Ulsan and Gyeongnam, the customers are served saltier food than that serve to those in other regions.” (Participant 6, Group 1)

2. Even the restaurants that do not participate in the project use less salt than they did previously. The participants who do not participated in the HRSR project also reported that their use of salt had decreased compared to their previous salt usage. However, this decrease was not based on health concerns like that of those who participate in the HRSR project. In the past, most of the restaurant owners who do not participate in the HRSR project said that they used more salt to preserve food for longer periods due to a lack of refrigeration facilities. However, their use of salt has decreased with recent advances in refrigeration facilities. However, recent interest in health has been a factor in not making food more salty.

“The salinity of food has decreased a lot compared to the old days. In the past, I used salt in a 1:1 ratio to make fermented fish as there was no refrigeration facility. Now I use it in a 3:1 ratio.” (Participant 6, Group 2)

“It has become less salty. How do I implement the low-salt measures? We are doing it now. We are trying not to make our food salty.” (Participant 1, Group 2)

Experience of salt reduction in restaurants that participate or do not participate in the HRSR project

1. Considering the use of more salt as customers complain about the taste of the food. The restaurants that participate in the HRSR project were likely to be labeled as tasteless restaurants. In addition, it was not easy to continue participating in the project as the taste of foods on the menus changed after reducing the amount of salt. Nevertheless, the participants made great efforts to adopt low-salt measures for the health of their customers. Specifically, the participants were striving to identify approaches to serve tasty food while using less salt.

“We cannot meet the need of every single person that enters through our doors. We believe that restaurants serve what they consider average for all in general. I try to make it average as well. It should not be too strong, but not too weak. If I make it too bland, people will say that the food does not taste good. The restaurant will be labeled as a bad one, 100%.” (Participant 5, Group 1)

“At first, there were a lot of complaints about the food being too bland. There were furious customers, demanding salt angrily. It has been a while, and now there are no more complaints.” (Participant 1, Group 1)

2. Adopting various approaches to reduce the amount of sodium in diets

The participants in both groups were aware of the important of low salt diet. Participants participating in the project had to regularly measure salinity every day with a salinity meter, an objective method, under the management of the competent district office. On the other hand, participants who did not have a salinity meter complained of inconvenience during the salinity measurement process due to the cost burden of the salinity meter. In this case, salinity was measured using each measuring cup. Non-participating restaurant participants also tried to measure salinity, but it was not maintained continuously. In addition, participants were considering various ways to practice low-salt by making various efforts such as participation in low-salt education and attempting to change the type of salt.

“A salimeter is rather expensive. ... We use our own measuring cup and do not additionally check salinity afterward.” (Participant 2, Group 2)

“As an alternative, I try to use better salt. I am using Himalayan pink salt, which is expensive but much better in terms of salinity and all. It is not only salty but also savory.” (Participant 6, Group 2)

3. No apparent changes in sales observed after participating in the project

The restaurant owners who participate in the HRSR project mentioned that some customers had been complaining about the taste of their food since their participation in the project. However, the customers have gradually become used to it, and patients and the elderly have given positive responses about the reduced salt. Based on such response from customers, the restaurant owners use less salt not only in their main dishes but also in the side dishes. The restaurant owners who participate in the HRSR project mentioned that there were no changes regarding food sales after their participation in the project. Accordingly, it was thought that there was no need for restaurants to hesitate to participate in the HRSR project because of concerns about a decrease in sales.

“They used to leave the soup; but now, they dig through the entire meal. I realized the importance of salinity. I have been thankful for the fact that the customers appreciate our food till the last drop.” (Participant 4, Group 1)

“Patients seem satisfied with our menu, saying that it is not salty, and they also bring their friends who would like it. However, at first, there were a lot of complaints about the food being too bland. There were furious customers, demanding salt angrily. It has been a while; there are now no more complaints.” (Participant 1, Group 1)

Areas to focus on to promote the HRSR project

1. A change in the perception of sodium is required in Korea

Regardless of the restaurant owners' participation status in the HRSR project, they that it was more important to promote the importance of a low-sodium diet to the public to encourage them to independently patronize healthy restaurants for sodium reduction rather than designating a lot of HRSR. The participants also stated that it will be pointless for them to participate in the project and continue their participation without improvement in customers' awareness of low-sodium diet and without its promotion by the local government.

“We tried to reduce sodium. We kept measuring salinity and all. However, the situation did not change significantly. If customers are aware of the need for low

sodium diet, they will feel the need to visit low sodium restaurants, and they will visit low sodium restaurants through blog search, but still now they have low awareness of low sodium.” (Participant 6, Group 2)

“It is important to promote the importance of a low-sodium diet to induce the public to think, ‘I would like to dine at a low-sodium restaurant.’” (Participant 4, Group 2)

2. Practical support, not just bureaucracy, is required

Most of the restaurant owners who participate in the HRSR project were frustrated about the unrealistic project progress and requirements of the gu office although they initially participated in the project at the recommendation of the gu office. Rather than emphasizing low sodium intake, the participants felt that it would have been better to proceed with the project after enough systematic preparation. For example, the participants emphasized that it would have been more realistic to proceed with the project after developing the alternative food menus for a low-sodium diet at the government level.

“The officials tell us to use less salt saying, ‘do this and do that,’ and they go to the restaurants they like... If they were really concerned about the public health, they should have further promoted the low-sodium diet and encourage the patronage of low-sodium restaurants.” (Participant 4, Group 2)

DISCUSSION

In this study, as part of a policy to reduce sodium intake, two focus group discussions that included 12 participants who were restaurant owners who participate or do not participate in the HRSR project were organized to document their overall experience of the project and in-depth awareness of the promotion plan. Despite reports that the satisfaction of restaurant owners as well as customers was high after restaurants that participate in the HRSR project reduced the sodium content in their menus [16,17], this project has not been implemented in Korea, and there is paucity of related research. This study is significant in that it compared the in-depth perceptions of the restaurant owners that participate and those who do not participate in the HRSR project to explore approaches to expand and promote the project.

An encouraging finding in this study is that both the restaurant owners who participate and those who do not participate in the HRSR project were aware of the importance of a low-sodium diet for health. This implies that they can easily understand the need for the HRSR project. However, the major problem identified was that the awareness of the HRSR project is still low. The project had been recommended to restaurant owners who are participants or non-participants by an official at the gu office. Therefore, it is necessary to organize more active publicity campaigns to promote the HRSR project. Furthermore, it is necessary to conduct a regular survey of restaurant owners and the public to examine the extent of the awareness of the project.

To promote the HRSR project, more attention needs to be paid to the difference in business perception between participating restaurant owners and non-participating restaurant owners (**Fig. 1**). The restaurants that participate in the project should be able to continue their business to ensure a gradual increase in the number of restaurants that participating in the. As the restaurants that participate in the HRSR project generally had positive experiences

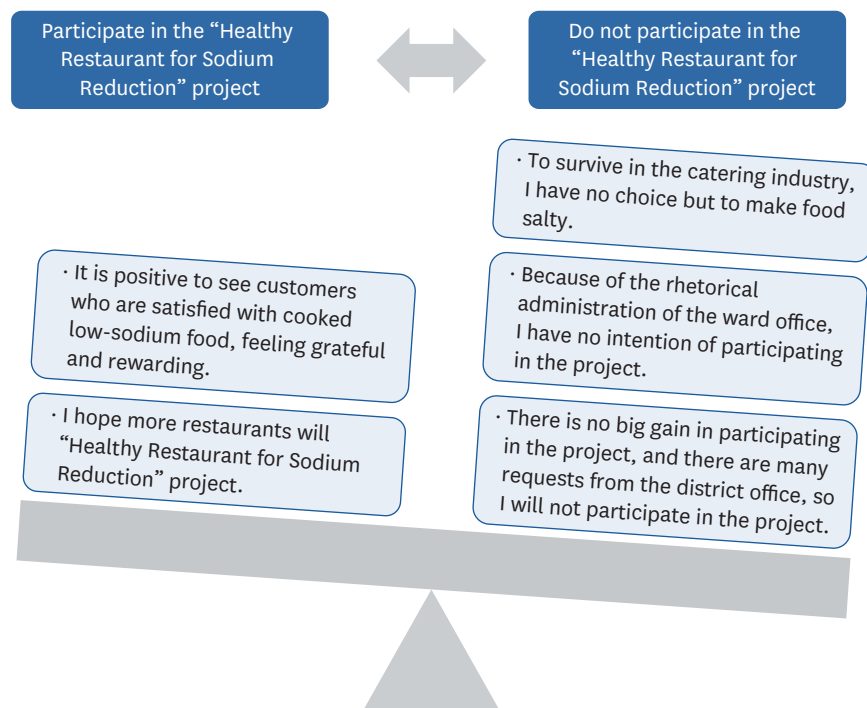


Fig. 1. Difference in perception regarding Healthy Restaurant for Sodium Reduction project between participating restaurant owners and non-participating restaurant owners.

with the project, the business sustainability of the project for participating restaurants was expected to be high. In particular, the increase in the willingness of other restaurants that are considered competitors to participate in the project was impressive in that it reflected the positive experiences of the participating restaurants. It seems beneficial to use testimonials or articles that share the positive experiences of the restaurants participating in the project for the promotion and invigoration of the project.

To promote the HRSR project, it is necessary for more restaurants to participate in the project. The major concern of restaurant owners who are reluctant to participate in the HRSR project was that their low-sodium menus would be labeled as bland [22,23]. The restaurant owners who do not participate in the project commented that the reason for using more spices or seasoning with high amounts of sodium is to meet the taste demands of their customers as some customers described the heavily seasoned food as savory and delicious [24,25]. In other words, the participants reported that they had no choice than to use more salt to survive the competition with large franchise restaurants and differentiate themselves from other restaurants. However, considering that the business owners did not experience a decrease in sales after being designated as HRSR and received positive reviews from customers, these concerns may be erroneous. Furthermore, emphasizing the fact that there are recipes that can taste good even with less sodium is expected to be a good approach to encourage non-participating restaurants to participate in the project.

To increase participation in the HRSR project, it may be necessary to expand tangible and intangible incentives for project participation. The restaurant owners that did not participate in the project were concerned that there would be no significant benefits from participating in the project and that they would only end up with more administrative tasks. The sales of restaurants that participate in the HRSR project did not decrease neither did their sales increase significantly.

It may be necessary to develop practical measures that can lead to an increase in sales after the designation of HRSR, such as holding events to promote patronage of HRSR and distributing vouchers that can only be used in HRSR reduction. Furthermore, to reduce the administrative burden, which was a concern by non-participating restaurants, it is necessary to assess whether there are unnecessary administrative procedures related to participation in the project.

On the other hand, it is expected that demonstrating the effectiveness of the HRSR project will be used as evidence to increase financial or non-financial incentives for the project. While both the restaurants that participate or do not participate in the project were making efforts to reduce sodium, a crucial difference related to sodium reduction practices between the 2 groups of restaurants was whether they consistently and accurately measured the exact sodium levels in the diets on their menus. Although the restaurants that do not participate in the project also measured salinity using individual approaches, it was usually only a one-time measure without using a standardized salinity measurement method. It may be necessary to objectively measure and compare the salinity of the foods served by the restaurants that participate or do not participate in the project and quantify it as an effect of the project [26]. Such an evaluation of the effectiveness of the project will help to expand the tangible and intangible incentives of the project while providing the data that would serve as promotional material for HRSR.

The goal of the HRSR is to reduce sodium intake among the national population. Although the menus of restaurants that practice sodium reduction have a lower sodium content than that of other restaurants, the sodium intake of eating three square meals at the restaurants that participate in the project is expected to greatly exceed the sodium intake recommended by the WHO, hence the need for gradual reinforcement of the designation standards for HRSR. To strengthen the designation criteria for HRSR, it may be necessary to increase the preference for low-sodium diets among the entire population in the future. In other words, to reduce the sodium intake of the entire population, only the HRSR project is insufficient. Furthermore, it will be necessary to expand and implement more multidimensional strategies such as low-sodium diet campaigns, increased availability of low-sodium foods, and the introduction of a sodium tax. This is consistent with the reports of participants in this study that emphasized the need for government-level efforts and public awareness improvement.

This study has two limitations. First, the participants of this study were only recruited from Ulsan Metropolitan City in Korea. The food and beverage industry is affected by the climate of the region, especially in the case of foods containing salt. Since Ulsan Metropolitan City has a mild climate in Korea and a population with high sodium intake [27]; therefore, the awareness of a low-sodium diet may be relatively low in the interpretation of the study results. Second, the restaurants that did not participate in the project were selected from a list of GR. Therefore, there is a possibility that owners of GR, compared to owners of general restaurants are relatively more interested in a low-sodium diet, which may have led to less prominent differences in the perception of low-sodium diet between the 2 groups in this study. In future research, it would be necessary to examine the awareness of HRSR quantitatively or qualitatively in different types of restaurants and in different regions.

To reduce the sodium intake of the entire population, it is essential to consider the restaurant industry as it can play a key role in reducing the sodium intake of customers. However, it cannot be said that the HRSR project is active in Korea. This study, which investigated the in-depth awareness of the HRSR project among restaurant owners who participate or do not participate in the project, will provide basic data for identifying approaches to promote the project. This

study shows that, awareness alternatives such as more active publicity for HRSR identification of approaches to dispel the perception that low-salt food is not tasty, and preparation of a plan to increase sales of HRSR should be developed. This study is also expected to inspire subsequent research on various low-sodium interventions as well as HRSR.

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SUPPLEMENTARY MATERIAL

Supplementary Data 1

Focus group discussions guidelines

[Click here to view](#)

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