Reducing Language Barriers in Health Insurance Access among Chicago Public Schools' Korean-Speaking Families

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Abstract

Objective:

The objectives of this study were to explore the underlying problems in the Chicago Public School (CPS) system related to language barriers and to examine the effect of reducing the language barrier in the CPS hotline service for parents of Korean-speaking students. Ultimately, this study aimed to reduce disparities in health insurance access among all non-English speaking students that have had no language support.

Methods:

The study design was a quasi-experimental pre-post design. I collaborated with Children and Family Benefits Unit (CFBU) and the CPS Department of Finance. CFBU which has been within the Office of Student Health and Wellness (OSHW) has helped CPS families to get public benefits such as Medicaid. Also, the CPS Department of Finance has helped OSHW with financial services (e.g., reimbursement, federal funding, etc.). Both teams helped me to select the target Korean-speaking population. After collecting baseline data of the target population, I delivered the HACK intervention which was named after the acronym for "reducing the language barrier in **H**ealth Insurance **A**ccess among **C**PS **K**orean-speaking families." Health Insurance Access indicated the CPS hotline service that has helped CPS families to enroll or renew their public benefits cases or to get health insurance information. The HACK intervention was to add the language support to the CPS hotline service. When collecting data about

Medicaid statuses of the target Korean-speaking families after delivering the HACK intervention, I compared baseline data of the target Korean-speaking families to the post-intervention data of the targets. To evaluate the intervention objectively, I also compared the post-intervention data of the target Korean-speaking families with the data of the Spanish-speaking counterparts selected after the intervention ended. OSHW gave me the de-identified database of Spanish-speaking students from the same schools that Korean-speaking CPS families (i.e., the target population) were enrolled in. I randomly picked the same number of Spanish-speaking students from the database that OSHW gave me and collected Medicaid statuses of selected Spanish-speaking families. Then, I compared the percentage distribution of each Medicaid status among Spanish-speaking families with that of the target Korean-speaking families at the post-intervention period.

Results:

After receiving the HACK intervention (i.e., reducing the language barriers in Health insurance Access among CPS Korean-speaking families), the rate of active Medicaid status among the target Korean-speaking families increased by nearly 31% while the rate of inactive Medicaid status dropped to the zero percentage. Also, the rate of no insurance information status among the targets decreased by over 15%. In terms of the comparison between the percentage distribution of each Medicaid status among the target Korean speaking families at the post-intervention period and that of Spanish-speaking population randomly selected at the post-intervention period, the difference in the rate of active status was approximately 30%. The rate of active status among Spanish-speaking families was higher than that of the target Korean-speaking families

at the post-intervention period. The difference in the rate of inactive status among Korean and Spanish at the post-intervention period was 23%; the rate of inactive status among Spanish-speaking families was higher than that of the target Korean-speaking families as well. Unlike the comparisons above, the rate of no insurance information status among the target Korean-speaking families at the post-intervention period was higher than that of Spanish-speaking families when comparing each rate of no insurance information status. The difference in no insurance information status among Korean and Spanish at the post-intervention period was 54%.

Conclusion:

Adding language support was helpful to reduce the rates of inactive Medicaid and no insurance information status, and to raise the rate of active Medicaid rate among the target Korean-speaking families; the HACK intervention was effective. Future work is, however, still needed to minimize the difference in insurance status between Korean-speaking families that have not had any language support and Spanish-speaking families that have had sufficient amount of language supports.

Introduction

According to the Pew Research Center, the United States Asian population increased by 72% from 2000 to 2015 (1). This was the fastest growth rate among any racial or ethnic group during this time period (1). Moreover, the total number of Asian new immigrants exceeded that of Hispanic immigrants in 2010, which had been the largest group of immigrants since 2000 (2). Furthermore, the rate of Asian American children under 18 has been growing as well (3). The population of Asian American children aged under 18 in 2000 was 3.7% of the total children population aged under 18

in the United States. In 2010, the proportion of Asian American children aged under 18 among all children aged under 18 in the United States became 4.6% (3). Child Trends predicted that an estimate of Asian American children population aged under 18 in 2020 will become 5.4% of all children in the United States.

The growing Asian American population highlighted the need to utilize health care for Asian Americans further. According to Carrasquillo, Health Care Utilization indicated the use of health care services for prevention and treatment for health problems, health promotion, and getting health information (4). Kim and Keefe reported that Health Care Utilization among the Asian American population in the U.S. was lower than the U.S. Caucasian population (5). It meant that the Asian American population has experienced disparities in accessing healthcare for the purposes above. Kim and Keefe indicated that one of the root causes of the difference in healthcare utilization was a language barrier (5).

Because of a low level of English proficiency, Asian Americans tended to find difficulty in seeking help, making healthcare appointments, finding health facilities, obtaining knowledge about an illness, and communicating with a health professional. Kim and Keefe argued that the related issue to the language barrier was health literacy which was including the capacity to understand the context of certain health situations (5). Without high levels of health literacy, Asian Americans tended to have misconceptions and misbeliefs about their health status and susceptibility to diseases (e.g., not taking the screening test based on the misbelief that the susceptibility to disease among a certain racial or ethnic group that they were included was low) that led to low motivation to access to the health care (5). Sentell and Braun explored the level

of health literacy among 48,427 of Asians, Latinos, and White in California (6). In this study, it turned out that 44.9% of people who had the limited English proficiency showed a low level of health literacy, whereas 13.8% of English speakers had a low level of health literacy (6). Among the races, Chinese had the highest prevalence of low health literacy which is 68.3%, whereas 35.6% of Korean and 29.7% of Vietnamese, 18.8% white had a low health literacy (6).

The studies above were focusing on English proficiency and health literacy of Asian adults. These indicators were related to access to healthcare not only among Asian adults but also Asian children. There was evidence that parental English proficiency was correlated to children's health services access. Yu, Huang, Schwalberg and Nyman found that non-English speaking families were less likely to have health insurance and contact doctors compared to English-speaking families (7).The U.S. Department of Health and Human Services (HHS) reported that 75.5% of Asian Americans spoke their own languages, not English in 2015 (8). Among them, 51% of Vietnamese, 46% of Chinese, 23% of Filipinos, and 21% of Asian Indians had a low level of English proficiency (8).

These national trends were also found in Chicago. The Asian population has been growing significantly in Chicago as well, with U.S. census data indicating that the Asian American population in Chicago has increased by 10.9% between 2010 and 2017 (9, 10). As the proportion of Vietnamese, Chinese, Filipinos and Asian Indians among all Asians in Chicago was nearly 78% in 2017, it was safe to say that the level of English proficiency among Asian American population was low in Chicago as well (10).

It meant that there was a higher possibility of Chicago Asian children experiencing the disparities in health care access due to the language barrier.

Language barriers among non-English speakers including Asian children in the healthcare system were a potential concern for Chicago Public Schools (CPS). In student year 2018, there were 158 different primary languages spoken by the 402,228 CPS families with children in the school system (11). The number of CPS families who spoke a certain language was from 1 family to over 200,000 families. Over thirty languages were used by more than 200 CPS families and ten languages were used by more than 1000 CPS families. In spite of the variety of primary languages spoken by CPS families, materials (e.g., the letter from the principal, consent forms, etc.) that CPS parents must use to access to CPS services are written only in English, Spanish and Polish. There were two reasons why this was a potential concern. There was “the Student Health Forms Booklet” that included important information about the programs CPS provides (e.g., Emergency Response Plan, Individualized Education Program, etc.) that CPS children with preexisting medical conditions could take advantages of (12). CPS parents who did not understand the information in the booklet cannot take advantages of those programs. Second, the booklet included the important documents about the legal rights and responsibilities that every CPS child was required to submit to CPS schools under Illinois law (12). If parents/legal guardians who are responsible to follow these legal duties do not understand the booklet, the worst consequence can be the exclusion from CPS schools. In other words, a low level of parental English proficiency among CPS parents could cause disparities in CPS children’s access to CPS services (7).

In addition to the problems above, almost every part of the booklet included the statements advising the CPS parents to visit the CPS website if they want additional information about CPS services and programs (12). To get needed information, the parents needed to navigate the CPS website in some way (13). The lack of understanding of tabs and titles to navigate the website may lead to a disadvantage for the parents who needed additional resources. Unfortunately, the CPS website has offered the translations of each tab and title to navigate the webpage for the speakers of 7 different languages (i.e., Arabic, Mandarin [simplified Chinese], Filipino, Polish, Ukrainian, Urdu, and Vietnamese) other than English and Spanish with the embedded Google translator (13, 28). It meant that there was a higher possibility of nearly 62% of non-English and non-Spanish speaking parents could not get the needed information via the CPS website easily (11). In other words, the current language support in the CPS website was capable of helping only approximately 38% of all non-English and non-Spanish speaking parents. This language barrier within the CPS website was notable compared to the website of the Los Angeles Unified School District which was an organization similar to CPS. LA Unified School District website has provided a translation tab for English, Spanish and 10 different primary languages' speakers (14). If CPS website provided the translation service for 10 primary languages other than English and Spanish as LA Unified School District's website (with the assumption that the translation service of the LA Unified School District's website was based on a list of primary languages sorted by the highest number of speakers), it meant that CPS could provide the language supports for 63% of all non-English speaking CPS families.

There were many factors that influence healthcare access, with this project only focused on health insurance access. Children Family Benefits Unit (CFBU) which has been within the Office of the Student Health and Wellness (OSHW) has been responsible for helping CPS families to enroll in public benefits such as Medicaid or SNAP, renew their cases of public benefits or obtain health insurance information (13). Also, CFBU has been in charge of the CPS hotline service to reach out to CPS families who may be eligible for free or low-cost health insurance or who have not reported their health insurance status (13). The CPS hotline service also included the referral to Medicaid enrollment coordinator to process the whole enrollment process. Besides, CPS parents could contact CBFU to ask questions or report their insurance status by themselves. Health insurance access among CPS families was based on the active interaction between CPS parents and CFBU. However, CPS parents needed to understand the booklet mentioned above to get the contact information of CFBU (12). Even if CPS parents successfully contacted CFBU, there was a lack of either bilingual or multilingual employees who could help CPS parents with a low level of English proficiency in CFBU; the second language of existing bilingual employees was Spanish. According to the manager of the Office of the Student Health and Wellness (OSHW), the job seekers for OSHW were almost 90 people in Fall 2018 (Kenneth Papineau, 2018). Foreign language proficiency has been one of the most valuable skills that CPS has valued when recruiting employees, but there was no second language speaker other than Spanish speakers among job seekers (Kenneth Papineau, 2018). CPS' efforts to expand the capacity to help as many CPS families as possible with the hotline

service has been proved not effective as they expected it would be only because high language barrier existed throughout the whole CPS system.

The main purpose of my study was to examine the effects of reducing the language barrier among non-English speaking CPS parents in accessing health insurance. The ways to reduce the language barrier in accessing health insurance were by offering translation/interpretation service for CPS parents using the CPS hotline service. As I was the only one to deliver the intervention to reduce the language barrier, the target population was Korean-speaking CPS families. The variables I used to evaluate the intervention were changes in the rate of each Medicaid status among the target Korean-speaking families because Medicaid status was the basic indicator of health insurance access. First, I examined the effects of the intervention on Korean-speaking families comparing pre- and post-intervention Medicaid status data. In addition, I used data for Spanish-speaking families who have taken advantage of Spanish language services to compare the Medicaid statuses of Korean-speaking families with Spanish-speaking families.

There were two reasons why I wanted to use the data of Spanish-speaking CPS students. One was to highlight the magnitude of the problem among CPS families who were the non-English speakers with insufficient language support. Another was to use the data of students whose primary language was Spanish as a comparison to evaluate the effect of the intervention. If the results of the intervention for Korean-speaking students and Spanish-speaking families were similar to each other, it would be natural to conclude that the HACK intervention played an important role in reducing language barriers to accessing health insurance among the target Korean-speaking families. On

the other hand, if the post-intervention data of the target Korean-speaking families and the data of Spanish-speaking families showed the different trend, the conclusion may become either that the intervention period was too short to see the effectiveness of it or that the reduction of the language barrier was not enough to reduce the disparities in accessing health insurance.

The first hypothesis of the study was that language barriers within CPS led to a lack of insurance coverage among non-English speaking families. The second hypothesis was that reducing language barriers was effective to reduce disparities in health insurance access among non-English speaking families.

Method

The study design was a quasi-experimental pre-post design. After collecting Medicaid status data of the target Korean-speaking population prior to the intervention, the translation/interpretation intervention took place. Then, I obtained Medicaid status data of the target Korean-speaking families after the intervention. The next step was to analyze the data collected from the intervention. The title of intervention was HACK which had two meanings. One was the acronym that stood for the intervention itself, “reducing a language barrier in **H**ealth insurance **A**ccess among **C**PS **K**orean family.” Another was the meaning of HACK in Korean. HACK sounded like “nuclear power” in Korean. Koreans have used this expression when describing the severity (or importance) of something (15).

Study participants

The target population was Korean-speaking CPS families that may be eligible for Medicaid and that there was no recent report to update their Medicaid status. The

Medicaid status of the target population at the pre-intervention period included 3 main statuses: Active, Inactive, and No insurance information (11). Active status included "Active Medicaid Recipient Identification Number (RIN)," and "Active in Last 90 Days - No Evidence of Recertification on Report Date" (11, 22); Inactive status indicated the status that inactive Medicaid RIN was in the CPS database that included health information of CPS students on a monthly basis (11, 22). No insurance information status indicated either "Unknown Medicaid status" or "Not available" (22). "Not available" meant that there was no information from CPS families. OSHW could not determine whether CPS families had not reported their information yet or they were refused to report their insurance information (Kenneth Papineau, 2019).

I got help from the CPS Department of Finance and CFBU when selecting Korean-speaking families prior to the HACK intervention (16). Both teams worked together to find out the schools in which most CPS Korean-speaking students were enrolled in January 2019. The reason why they needed to find out this information first was that both the referral to the Medicaid Enrollment coordinator and adding the language support to the enrollment process became much easier and faster with this step. It was a necessary step to reduce the time required to finish the HACK intervention. After selecting the eligible Korean-speaking families, they gave me the list of the target Korean-speaking population. Then, CFBU gave me the contact information of the Medicaid enrollment coordinator who was assigned to the schools that all my target Korean-speaking population were enrolled in. With the help of this coordinator, I was able to make a referral for the target population to his office and give the language

supports (i.e., translation/interpretation) while the coordinator and the target family was working on the Medicaid enrollment process.

We enrolled 13 Korean-speaking families in this study, with these families enrolled in seven different schools (17). There was only one Medicaid Enrollment coordinator who served all those schools. The grade level of the target Korean-speaking population prior to the HACK intervention was ranging from preK (i.e., 3 or 4-year-old) to 11th grade (17). There were two families who had active Medicaid Statuses including "Active RIN" and "Active In Last 90 Days," two families who had inactive Medicaid statuses with Medicaid RIN left in the CPS database, and nine families who had no insurance information statuses including both "Unknown Medicaid Status" and "Not available" (17).

Intervention

The HACK intervention added translation/interpretation service to the CPS hotline service for the target Korean-speaking families. As mentioned above, the CPS hotline service was to help CPS parents to access to health insurance in various ways. By adding the language support to the CPS hotline service, the expected outcomes were to be able to collect every health insurance status from the target Korean-speaking families and help them to enroll in Medicaid if they want. Also, the other expected outcome was that the percentage distribution of each Medicaid status among the target population at the post-intervention period was similar to that of Spanish counterparts selected after the intervention ended.

The preparation of the HACK intervention including translating the essential documents and the training session started from the mid-January and ended on

January 25, 2019. The time period of the HACK intervention was from February 5 to April 16, 2019. The first step was to translate the materials for the CPS hotline service. I translated “private insurance letter,” “IEP letter September_2018,” “hotline call_3 attempt follow up_final letter,” “Sullivan HS - customized letter” and “IEP script and scenarios_07_10_18” (18, 19, 20, 21, 22). The purpose of “private insurance letter” was to introduce the CPS hotline service, whereas that of “IEP letter September_2018” was to let the target Korean-speaking population know that they may be “eligible for low cost/free health insurance” (18, 19).

“IEP script and scenarios_07_10_18” was to guide me to get used to the way to greet to the target Korean-speaking families, what to ask, and the expected questions from the target Korean-speaking families. Also, there were precautions not to overwhelm the target Korean-speaking families by too many questions and sensitive questions (22). “Hotline call_3 attempt follow up_final letter” was a type of the following-up contact only with the target Korean-speaking families who expressed their interest in applying for Medicaid within the previous call attempts and who was asked to call back but did not call back (20). Then, CFBU requested to translate the last letter, “Sullivan HS - customized letter,” which was for the target Korean-speaking families of the HACK intervention to introduce the Medicaid coordinator whose office was located in Sullivan high school and who decided to let me add the language support during the Medicaid enrollment session with the target Korean-speaking families (21).

After finishing the translation of all materials needed for the HACK intervention, CFBU and I could schedule a time for training. The training for the HACK intervention was based on the actual training for CPS employees who were newly assigned to the

CPS hotline service should get. I needed to understand the whole mechanism of the CPS hotline service to give comprehensive language support to the target Korean-speaking families. During 2 hours of the training session, I learned the basic backgrounds and eligibilities of Medicaid, how to check Medicaid eligibilities, the documents to enroll in Medicaid, how to manage the case (e.g., Medicaid enrollment, redeterminations, etc.), and the basic process of the CPS hotline service such as target calling and data tracking.

To reach out to the target Korean-speaking families, I was allowed to use only the assigned CPS hotline telephone. With the assigned CPS hotline telephone number, the HACK intervention started with me calling each target family. If the target families had not answered to the call, I left the voicemail until I made all expected number of call attempts (22). When the target family answered the call from me, I tried to collect the necessary data to determine whether the target family had active Medicaid, inactive Medicaid, or no insurance information status (22). There were 11 types of dispositions to express the closed cases (i.e., stop reaching out to the target Korean-speaking families): 3 types of active Medicaid statuses (i.e., RIN collected, RIN is not collected, and private insurance), 3 types of prospective “active Medicaid status”, such as “appointment [with the Medicaid enrollment coordinator] scheduled/in progress,” “submitted application on behalf of client,” and “re-certification already submitted by client,” and 5 types of either inactive Medicaid or no insurance information statuses, such as 6 attempts without response from client, the invalidation of phone number in the database, “not eligible for Medicaid (after screened by the Medicaid coordinator),” and “others” (22). Based on the recommendation from CFBU, I decided to treat both cases

of having private insurance and having prospective “active Medicaid status” as the cases of active Medicaid status; I decided to treat the cases of any other scenarios as the cases of having no insurance information status. I made the first call for reaching out to the target Korean-speaking families on February 5, 2019 and made the last call on April 16, 2019. The whole process of the HACK intervention was described in Figure 1 (Appendix).

Data sources/Data Collection

First, I used the de-identified CPS database named “the student year 2018 final health service report 6-30-18” to clarify the association between the existence of language support and Medicaid status among all CPS students (11). This database was made by the self-report from the CPS parents. CPS has kept updating the database on a monthly basis and this database was updated on June 30, 2018 (11). Also, I used the same database to see several different factors (i.e., grade level and school location) categorized by each Medicaid status among Korean speaking-families that have had no language support and Spanish-speaking families that have had sufficient language support.

The source of the target Korean-speaking population data before the HACK intervention was the new database that CFBU and the CPS Department of Finance made for the HACK intervention (17). I collected the baseline data of the target Korean-speaking families from this database (17). It included the name of students and parents, the schools they were enrolled in and the grade levels at the time of the data entry, the Medicaid statuses, and the contact information to reach out. I used personal information

like the name and the contact information only to reach out to the target Korean-speaking families.

Like I learned from the training session, I documented every call log until I made all numbers of expected call attempts (i.e., 6 attempts). The method to collect the post-intervention data of the target Korean-speaking families was to track the call logs that I documented. The data of the Spanish-speaking group to compare with the post-intervention data of the target Korean-speaking families were also from the new database that was made for the HACK intervention (23). Unlike the database of the target Korean-speaking families at the beginning of the HACK intervention, the manager of OSHW gave me the database of 639 Spanish students enrolled in CPS schools that the target Korean-speaking families were selected from (23). I randomly picked the same number of Spanish-speaking families from this new database to compare it with the post-intervention data of the target Korean-speaking families.

Analysis

The analysis method was based on secondary data analysis. First, I analyzed the de-identified CPS database which was collected and administered by CPS until June 2018 (11). With this database, I could obtain the data of all CPS students to prove that there was an association between the existence of language support and each Medicaid status (11). Also, I analyzed the same database to see various characteristics of Korean-speaking families and Spanish-speaking families distributed by each Medicaid status (11).

After I collected the pre- and the post-intervention data (17), I compared those two data to analyze the effects of the HACK intervention. Also, I collected the data of

the Spanish counterparts against the target Korean-speaking families after the HACK intervention and compared those data to analyze the changes made by the HACK intervention were great enough to get close to the data of the group that had taken advantages of language support (23). In other words, it was another way to check the effects of the HACK intervention.

Result

There were 378,435 students currently enrolled in Chicago Public Schools out of 402,228 students reported in the student year 2018 database (11). At the time of the last update (i.e., June 2018), there were 158 different types of primary languages (11). The CPS system had the language supports (i.e., materials and services in one's own primary language) only for 2 out of 158 language speakers: English and Spanish (11). Polish supports were provided when requested (Kenneth Papineau, 2019).

Figure 2 showed the association between the existence of language support in the CPS system and each Medicaid status among all CPS students. Primary languages were sorted by the highest number of speakers. The horizontal axis included the first to the fourth-ranked languages and 25th-ranked (i.e., Korean) because it was the primary language of the target population in this study. The number 7 in parenthesis next to Chinese indicated the sum of 7 different types of Chinese (8). The vertical axis indicated the rate of active, inactive and no insurance information Medicaid status among each primary language speakers. The rate of active Medicaid status increased between English that the highest number of CPS students used and Spanish which was the second highest. Then, the trend of this rate kept decreasing and the rate between Polish (i.e., fourth) and Korean dropped dramatically. The difference between the

highest and the lowest rates of active status (i.e., Spanish and Korean) was 37.94%. However, the reason why English speakers had lower active Medicaid status than Spanish speakers could not be explained only by this study. To identify the reason behind it, future research might be needed. On the other hands, the rate of no insurance information status showed the opposite trend to the active status trend. Overall, the rate of no insurance information status showed an increasing trend except in Spanish and Polish. When it comes to Korean, no insurance information rate was skyrocketing. The difference between the highest and the lowest rate (i.e., Korean and Spanish) was 37.65% which was similar to the difference in active status rate. Unlike active and no insurance information rate, the rate of inactive status showed a nearly flat trend across the primary languages. Despite being neither upturn nor downturn trends, the inactive status rate in English speakers was the lowest rate than other languages' speakers. Figure 2 confirmed the first hypothesis regarding that language barriers within the CPS system caused a lack of insurance coverage among non-English speaking families.

Table 1 and 2 showed descriptive characteristics of Korean- and Spanish-speaking CPS students categorized by each Medicaid status. The total numbers of Korean and Spanish-speaking population were included only CPS students who were enrolled in CPS schools. There was one error in those tables. The total numbers of students by primary languages and the total number of students by school location were different from each other due to the variable named "blank" (11) "Blank" meant that some students were enrolled in multiple schools because of the special health conditions, generally disabilities. In other words, there were redundant data that I could not delete within the de-identified database (11). As CPS sorted the school location

following the Chicago Community Areas that CDPH established, the school location in table 1 and 2 were also following it (24). There were 77 different communities divided by 9 direction sides: Far North, North, South, Southwest, Far Southwest, West, Northwest, Far Southeast, and Central (24). I made few direction sides that have a common feature, such as Far North and North sides, into one main category (in this example, making Far North and North sides into North sides). After doing this, the main direction sides in table 1 and table 2 were North, South, West, East, Central, and Blank.

Figure 3 showed a comparison between the rate of each Medicaid status among all Korean- and Spanish-speaking families. This figure was based on the total number of students who were enrolled in CPS (11). While 66% of Spanish-speaking families had active Medicaid status, only 28% of Korean-speaking families had active Medicaid status. Also, there was only 14% of Spanish-speaking families who had no insurance information status, whereas 52% of Korean families had no insurance information status. The difference between the Korean and Spanish rate of no insurance information status was 32%.

Table 4 showed the results of the HACK intervention which ended on April 19, 2019. Among the target Korean-speaking families who had no insurance information status at the pre-intervention period, I changed about 34% of records into active status. The changed active status included the closed cases of having application in progress, active Medicaid RIN and private insurance. Approximately 66% of them remained unchanged. The unchanged no insurance information status included the closed cases of invalid contact information and 6 attempts with no response. In terms of inactive status, 50% of the target Korean-speaking families having inactive status at the pre-

intervention period classified into no insurance information status after the HACK intervention. 50% of them classified into active status. Lastly, all targets having active status at the pre-intervention period confirmed that they still had active RINs.

Figure 4 and figure 5 showed how the Medicaid statuses of the target Korean-speaking population changed between the pre-intervention and post-intervention. With figure 4, we could see the changes over time, while we could compare each Medicaid status rate between the pre- and post-intervention periods as a whole with figure 5 (28). Prior to the intervention, both rates of active and inactive Medicaid statuses among the target Korean-speaking families were 15.38%. At the post-intervention period, however, the rate inactive Medicaid status dropped to the zero-percentage rate whereas the rate of active Medicaid status increased by 30.77%. The rate of no information status decreased by 15.38% between the pre- and post-intervention periods. Both figure 4 and 5 confirmed the second hypothesis that reducing language barriers was effective to reduce disparities in health insurance access among non-English speaking families.

Figure 6 showed the difference in the rate of each Medicaid status among the target Korean-speaking families and Spanish-speaking families selected at the post-intervention (Spanish-speaking families were selected from the same schools that the target Koreans enrolled in). Even after the intervention, the rate of active Medicaid status among the target Korean population was nearly 31% lower than that of Spanish-speaking counterparts. The more striking result was that there was 0% of no information status among Spanish-speaking families while 54% of the target Korean-speaking families at the post-intervention period had no insurance information status.

In conclusion, the language barrier played an important role in health insurance access (i.e., collecting the insurance data, providing health insurance information, and helping students to enroll in Medicaid). With respect only to the effect of the HACK intervention itself, it was safe to say that the HACK intervention to reduce language barriers among Korean-speaking families in accessing health insurance was effective. However, the HACK intervention left much to be desired when comparing the results to the data of the Spanish group shown in figure 6.

Discussion

Throughout all phase of the HACK intervention, there were many partners engaged in. CPS (i.e., CFBU, OSHW, CPS Department of Finance, and the Medicaid enrollment coordinator) offered not only the de-identified data but also supports to do sampling, training, coordinating the process of Medicaid enrollment for the target Korean-speaking population. With working in harmony, the development and initiation of the HACK intervention processed in a less time-consuming and less expensive way. The effectiveness derived from the engagement of the community organization (i.e., CPS) was one of the strengths of the research. Another strength of the study was that I was able to target Korean-speaking families. As there was an increasing significance of utilizing health services (in this case, access to health insurance) for the Asian American population in Chicago, targeting Korean-speaking families was meaningful. Moreover, the findings of the study might be the first step to reduce the disparities in accessing health insurance among Asian Americans, and by extension, all non-English speakers in Chicago.

In addition to learning the positive part of the public health intervention, there was a negative part: learning the differences between the ideal and the real process of the intervention. When proposing the HACK intervention, this intervention was to add the language supports both for the CPS Medicaid hotline service and the CPS student health forms booklet that were the essential parts of CPS providing health services. The reason why I tried to include both parts of CPS services was that there was a big difference between these two services: whether the health behavior of interest (e.g., enrolled in Medicaid) can be changed by the willingness of the recipients. Distributing the translated version of the student health forms booklets is a passive intervention that should wait for the contact from CPS parents, while the CPS hotline service is a proactive intervention that reaches out to the target CPS students (i.e., those who may be eligible for Medicaid or SNAP) from the side of CPS. In other words, distributing translated version of the student health forms booklets required the willingness of the parents to contact CFBU more than the CPS hotline service. If the plan to distribute the translation version of the booklet had been done, the results of the study would have included the changes in overall Medicaid status caused by the willingness of Korean-speaking families.

Unfortunately, the attempt to do the HACK intervention as planned was failed because of several reasons. First, the translation of this booklet required the consultation from the lawyer who was a specialist in the laws related to healthcare and healthcare-related services such as HIPAA consent form (12) and was bilingual in Korean and English. Due to many jargons, all legal forms in the booklet may be interpreted in a vague and confusing way (12). Though OSHW offered the opportunity

of getting the consultation from the lawyer who has worked in cooperation with them, I did not take the opportunity. Because the lawyer was not Korean/English bilingual person, the lawyer was not able to give back translation for me to reduce the translation errors (30). Back translation meant translating the document which was translated into another language before back into the original language (30). The second reason was that there was not enough time to complete all processes: the translation, confirmation, printing out all translated materials, distribution and collecting the post-intervention data. Moreover, there was a cost-effectiveness issue regarding whether it was worth spending the resources because the total number of Korean-speaking students enrolled in Chicago Public Schools was 252 (11). It meant that the proportion of Korean-speaking students was approximately 0.07% of all CPS students (11). As the organization that was run by the limited budget, CPS may not be able to ignore this cost-effectiveness issue easily.

Furthermore, the fact that the CPS databases were based on the self-report from the parents was another limitation (11, 17, 23). Hoskin identified 7 disadvantages of using the self-report data: Honesty management, Introspective ability, Understanding, Rating scales, Response bias, Ordinal measures, and Control of the sample (29). Among these disadvantages, honesty management, introspective ability, and response bias represent the limitations of the HACK intervention due to the self-report data (Kenneth Papineau, 2018). It meant that we did not know whether the parents report their information honestly, whether the parents remembered the information correctly, and whether the parents were biased when they were reporting (Kenneth Papineau, 2018). Another problem was found during the HACK intervention. It was also related to

the reliability of the CPS database. When reaching out to the target Korean-speaking population that was supposed to include only Korean-speaking families, there were 2 parents who spoke only in English. There were two possibilities to explain these cases. One was that those families were mixed families speaking multiple languages in their house. Another was that the data related to those families were wrong.

Implications of the Project

There could be many confounding factors (i.e., other root causes) behind the findings of the study. The first one may be a cultural barrier to access to healthcare (e.g., health insurance, etc.). Zhang conducted a study about exploring the association between Chinese culture and their access to health cares, especially dental services (25). The cultural barriers that made Chinese not to take dental behavior were four: the misperception about the cause of the diseases, the tendency to seek self-treatment (i.e., alternative treatment), the tendency not to take doctors' advice and attitudes toward the health care practitioners. Chinese cultural traits that became the barriers to healthcare access were also founded in the study of Kim and Keefe. Kim and Keefe found that the misconception of the disease made only 14.8% of Korean immigrant women to take the breast cancer screening test (5). Moreover, the timing of seeking healthcare (i.e., one aspect of the healthcare access) of Asian American was later than the time that Whites sought healthcare because Asian Americans did not go to a doctor when they were asymptomatic or had symptoms, but not severe one (5).

Another confounding factor may be an illegal immigrant status, undocumented status. Hacker, Anies, Folb, and Zallman insisted that the reasons why undocumented international migration did not seek healthcare was not only policies and the financial

burden, but also stigma/discrimination and the fear of deportation. In terms of the policy, “denying access to insurance” was the big part of policy related to undocumented immigrants (26). Even if they did not suffer from the financial burden, the law would restrain their access to healthcare. Also, Hacker, Anies, Folb, and Zallman (26) confirmed that 65% of studies they reviewed found that the fear of deportation was an important barrier of undocumented immigrants. The undocumented immigrants tended to fear when they were in the emergency room that someone in the room might report them to the higher authorization or did not believe their symptoms. These feelings became barriers to healthcare access among undocumented immigrants.

Future Direction

As mentioned above, this research had many limitations. For future research, there were two interesting topics. First, it would be interesting to find out the association between the confounding factors mentioned above and the rate of active Medicaid status among non-English speaking families. Also, it would be interesting to figure out the reasons behind the fact that the rate of active Medicaid status among English speakers was lower than that of Spanish speakers.

Based on the fact that both English and Spanish speakers were approximately 92% of all enrolled CPS students, some might say that adding language supports for only 8% of all students is the waste of resources. However, public health is for the underserved and vulnerable population which was the very description of non-English speaking CPS families. To provide the equal quality of services as CPS has aimed, it is needed to find a way to reduce the problems that were newly found in this research.

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Appendix

Figure 1:
The steps of HACK Intervention (January 2019 - April 2019)

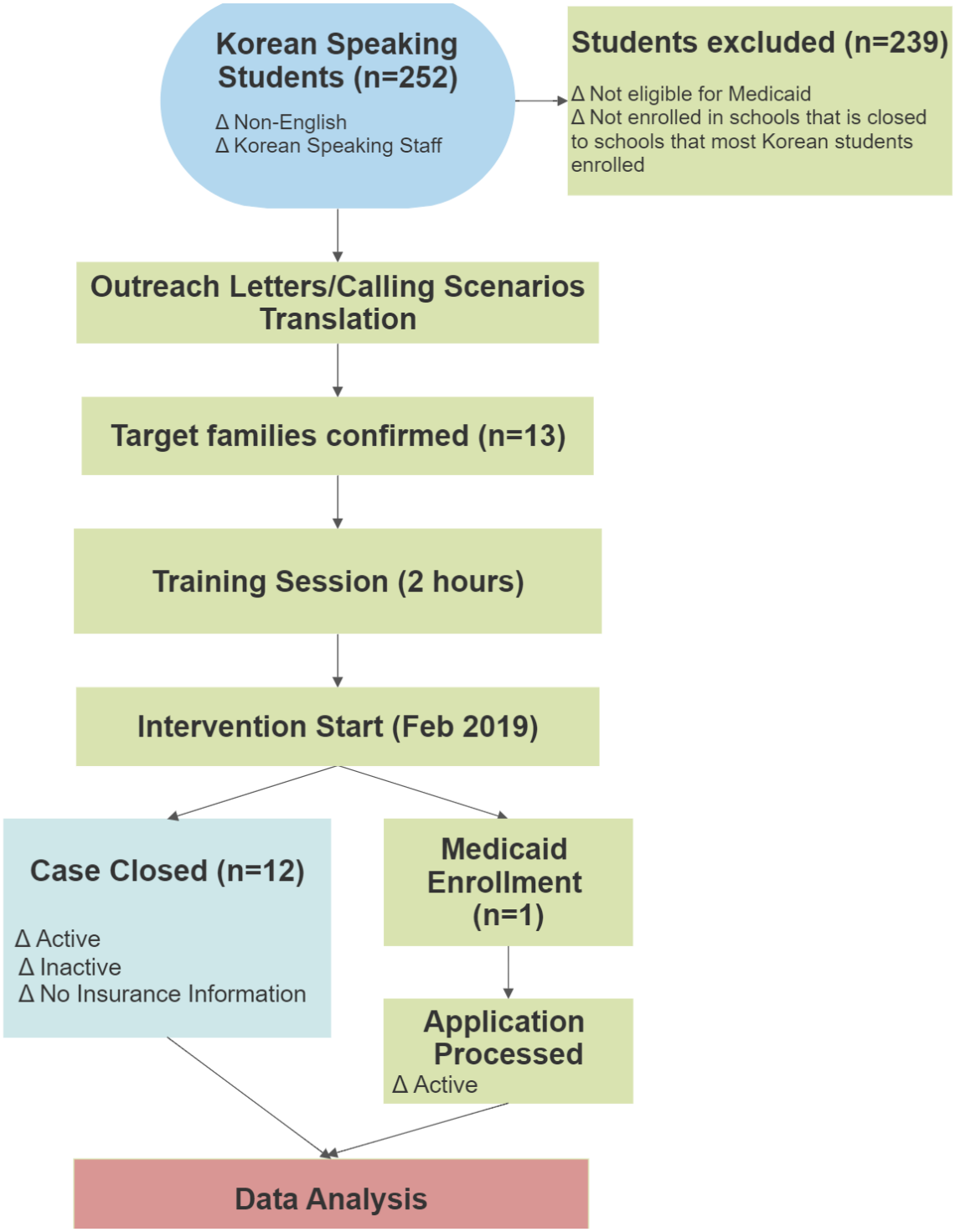
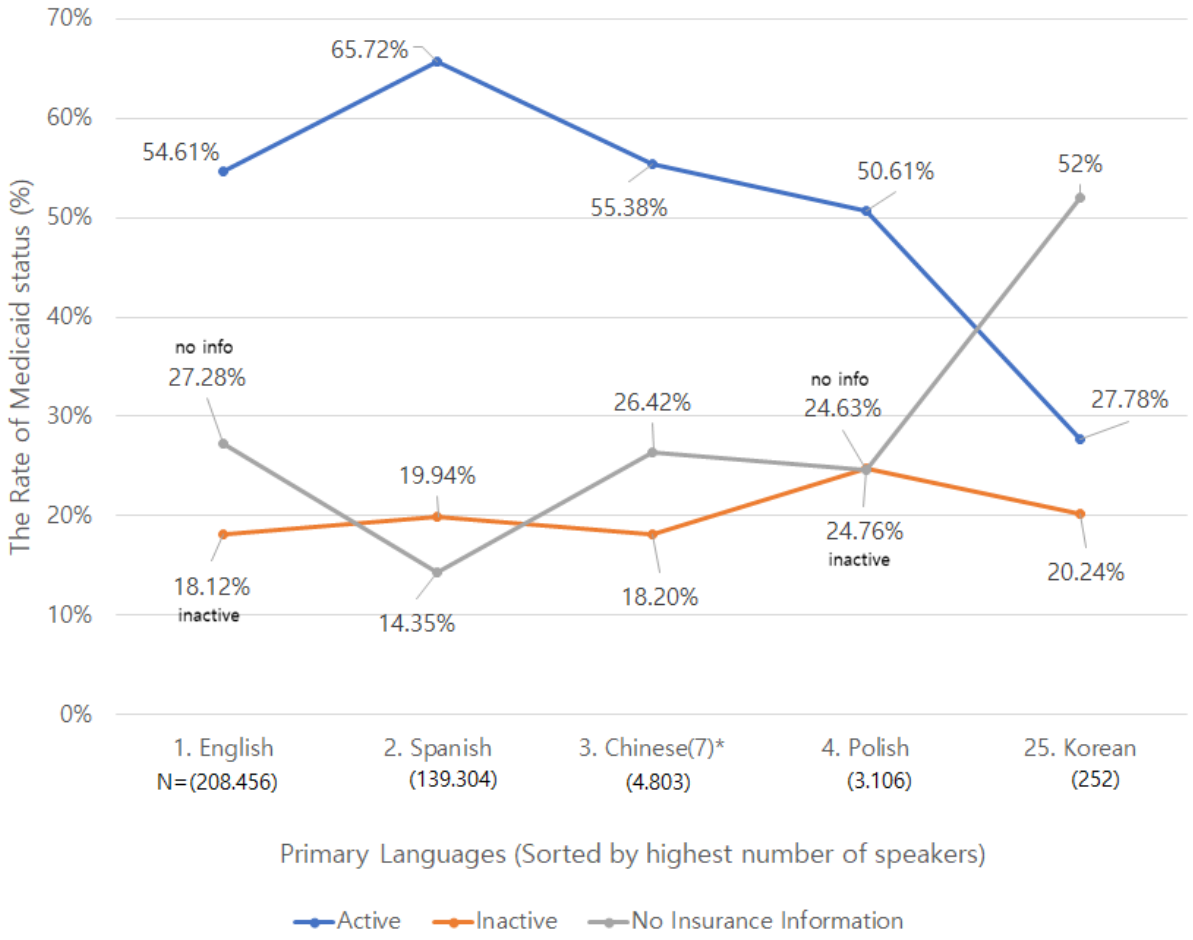


Figure 2:
The Rate of Medicaid Status by Primary Languages Sorted by Highest Number of Speakers (June 2018)



* Including 7 different types of Chineses
(Cantonese, Mandarin, Chaochow/Teochiu, Fukien/Hokkien, Hainanese, Shanghai, Hakka)

Table 1:
Descriptive Characteristics by Overall Medicaid Status: Korean (June 2018)

Variables	Overall Medicaid Status			
	Active	**Inactive**	**No insurance information**	**Total**
Descriptive Characteristics				
Primary Languages(N)				
Korean	70	51	131	**252[H]**
Grade Level (N)				
PreK[a]	8	0	6	**14**
K[o]	8	2	20	**30**
1-6	28	21	64	**113**
7-9	15	15	17	**47**
10-12	11	13	24	**48**
School Location(N)				
North Side (Far North+North)	46	39	84	**169**
South Side (South)	5	1	7	**13**
West Side (Southwest+ Far Southwest+ West+Northwest)	9	4	15	**28**
East Side (Far Southeast)	1	1	0	**2**
Central	4	6	24	**34**
Blank[ɣ]	5	0	3	**8**

[H] Exclude the students who are enrolled in multiple schools
[a] 3 or 4-year-old
[o] Kindergarten (generally, 5 to 6-year-old)
[ɣ] Students are enrolled in multiple schools (dual enrolled or therapeutic location)

Table 2:
Descriptive Characteristics by Overall Medicaid Status: Spanish (June 2018)

Variables	Overall Medicaid Status			
	Active	**Inactive**	**No insurance information**	**Total[H]**
Descriptive Characteristics				
Primary Languages (N)				
Spanish	91,350	27,607	19,841	**138,798[H]**
Grade Level (N)				
PreK[a]	3,838	507	5,226	**9,571**
K[o]	4,558	744	2,922	**8,224**
1-6	42,433	11,163	7,276	**60,872**
7-9	22,212	7,025	2,151	**31,388**
10-12	18,309	8,168	2,266	**28,743**
School Location (N)				
North Side	18,925	6,172	4,268	**29,365**
South Side	688	214	171	**1,073**
West Side	66,646	19,557	12,889	**99,092**
East Side	3,323	1,076	745	**5,144**
Central	837	445	291	**1,573**
Blank[ɣ]	1,028	190	1,522	**2,740**

[H] Exclude the students enrolled in multiple schools or included in grade 20*
[a] 3 or 4-year-old
[o] Kindergarten
[ɣ] Students are enrolled in multiple schools (dual enrolled or therapeutic location)

***Students aged 18 to 22 or who enrolled in Individualization Education Plan (IEP)**

Figure 3:
The Rate of Each Medicaid Status by Primary Languages (June 2018)

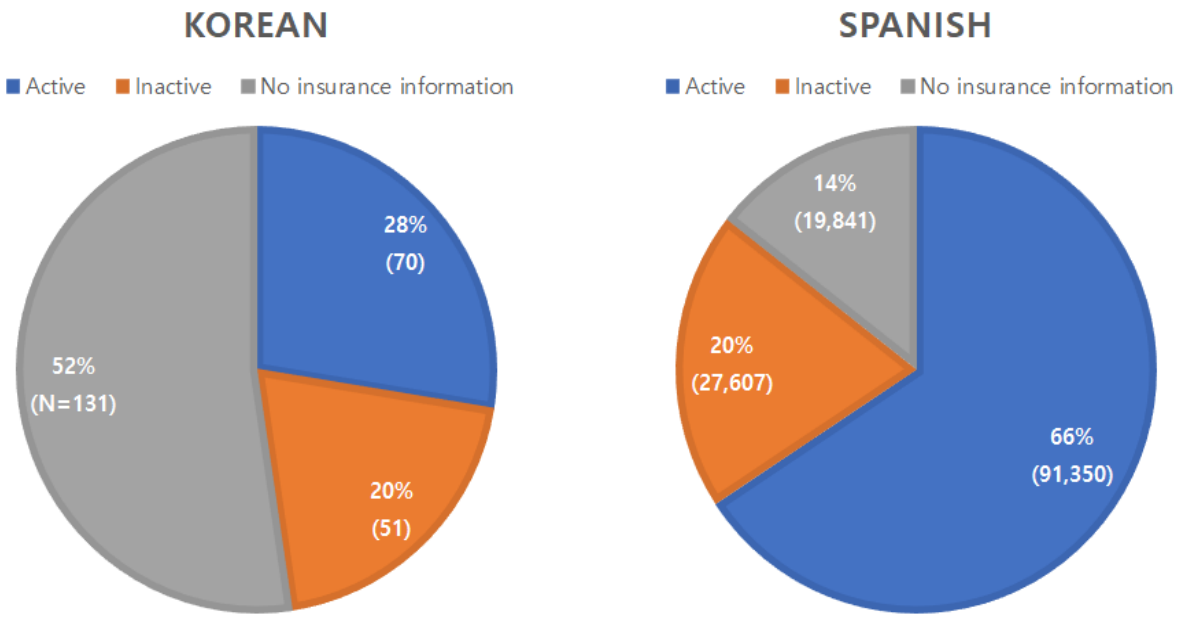


Table 4:
The Results of HACK Intervention (April 2019)

Medicaid Status	Total (N)	Case Closed[ς]		
		No information (N=7)	Inactive (N=0)	Active (N=6)
No information	9	6	0	3
Inactive	2	1	0	1
Active	2	0	0	2
[ς]includes 11 different dispositions				

Figure 4:
Medicaid Status Changes Between Pre- and Post-Intervention: Korean (February-April 2019)

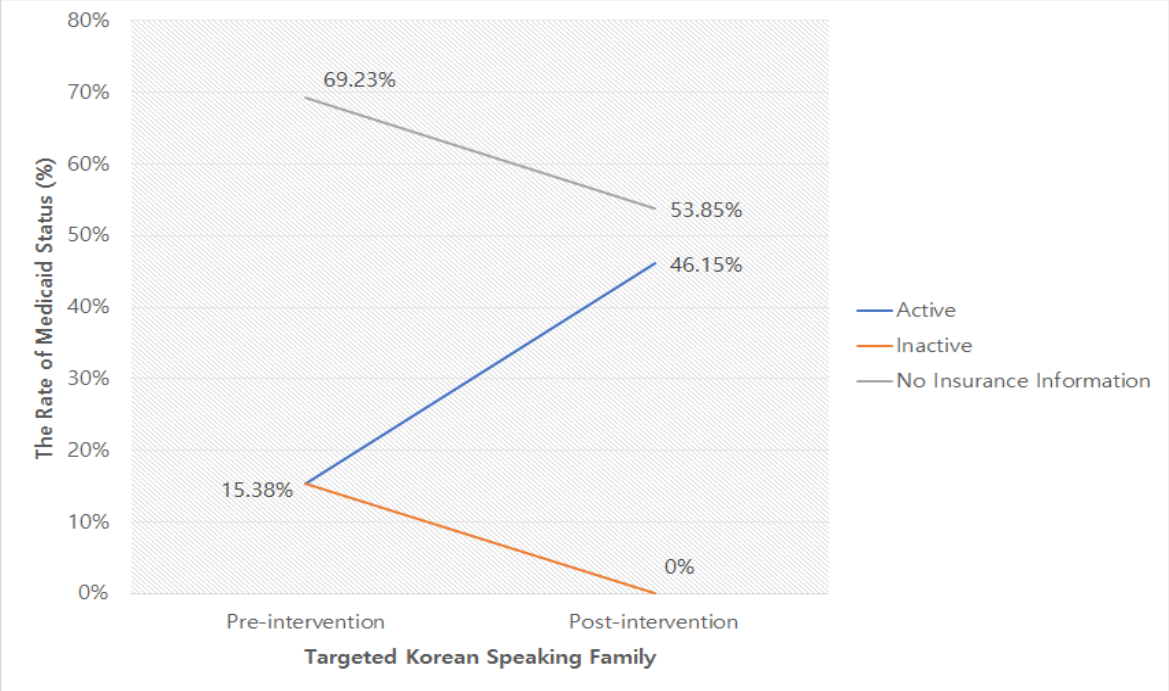


Figure 5:
The Rate of Each Medicaid Status: Pre- and Post-Intervention: Korean

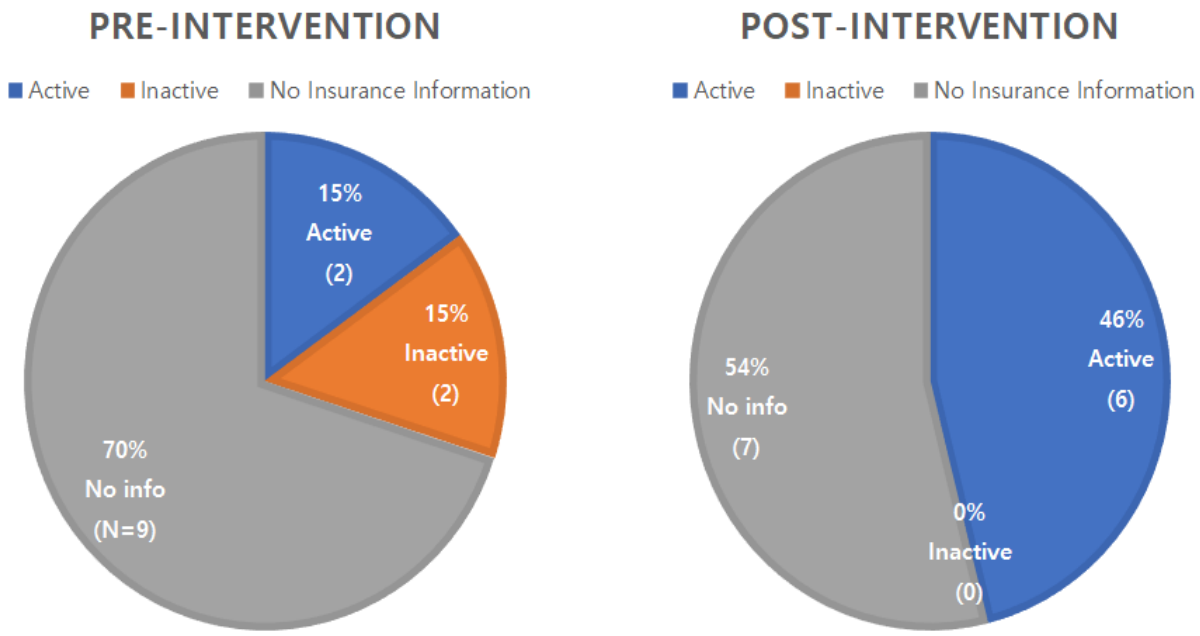


Figure 6:
Comparison of the Rate of Each Medicaid Status (Korean vs. Spanish): Post-Intervention