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Water Safety Education Programs in Culturally and Linguistically Diverse Seattle Communities: Program Design and Pilot Evaluation

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Water Safety Education Programs in Culturally and Linguistically Diverse Seattle Communities: Program Design and Pilot Evaluation

Cover Page Footnote

The authors would like to acknowledge Maryam Jafari for her role in developing the program, the Community Health Educators and interpreters who delivered the program and the Head Start locations that hosted us.

Abstract

Drowning is a public health concern that disproportionately affects children and minorities in Washington State. Community health educators from Seattle Children's Hospital designed a Water Safety Education and Lifejacket Giveaway Program for low-income parents of preschool-aged children from culturally and linguistically diverse backgrounds. The program was interpreted into multiple languages and parents and children in attendance received free lifejackets. The mixed-methods pilot evaluation of this program found statistically significant relationships between language and self-reported parent swim skill level (English-speaker OR 4.6; 95%CI: 1.84 – 11.54); and confidence of keeping one's child safe (English-speaker OR 3.34; 95%CI: 1.10 – 10.4). Additionally, parents who self-reported that they could swim had four times the odds of feeling confident in keeping their children safe around the water (95% CI: 1.21 - 13.28). Qualitative data from follow-up interviews identified that the program boosted parent knowledge and confidence in safe water practices. Multi-lingual delivery and the role of partner preschools was critical to this program's success. Specific programmatic focus on adult parent/caregiver skills and knowledge that reduce risk around the water should be a priority for future efforts to reduce drowning.

Keywords: drowning, parent education, education intervention, injury prevention, program evaluation

Introduction

Drowning was the leading cause of unintentional injury death for children aged 1-4 in the United States and Washington State from 2009 to 2013 and the second leading cause for children aged 5-9 in both geographic boundaries (CDC, 2016; Washington State Department of Health, 2014). Previous research from Washington State determined children in the 1-4 age group had the highest drowning rate (31 per million person years) and 85% of pediatric drowning deaths were preventable (Quan & Cummings, 2003; Quan et al., 2011). These findings mirror global trends that young children are at increased risk for drowning, a relationship thought to be associated with insufficient supervision (WHO, 2014a).

In addition to age, variables associated with gender, seizure disorders, alcohol use, risky behavior, legislation and regulation, environmental conditions and socio-economic status (SES) identify sub-populations with increased risk for drowning (Quan, 2014a). The consideration of ethnic minority groups, immigrant and refugee populations, and cultural factors is an important component of determining drowning risk (Gilchrist & Parker, 2014). Quan described the role of culture and ethnicity on drowning risk, highlighting drowning rate disparities in racial and ethnic minorities (2014b). Differences between minority and majority groups in knowledge, skills, and safe behaviors around aquatic settings likely

contribute to variations in drowning rates. The roots of these inconsistencies are complex and vary for groups of different heritage.

Several approaches exist to reduce drowning, and some evidence suggests a combination of strategies can enhance effect (Wallis et al., 2015; WHO, 2014b). Cultural and socio-economic barriers limit participation in water safety programs for certain groups. According to Golob and colleagues (2013), social exclusionary practices which influence the design and delivery of water safety education can act to marginalize ethnic and racial minorities. Language, access to swimming pools or places with lifeguards, and non-western cultural relationships with water and water recreation (or lack thereof) may hinder water safety programming from reaching some ethnic groups (Golob et al., 2013; Irwin et al., 2009; Irwin et al., 2019, Willcox-Pidgeon et al., 2020).

These barriers have consequences: in many high-income nations, drowning rates are higher among ethnic minority groups (Brenner, 2003). In King County, Washington State, the drowning rates for African Americans, Native Americans, and Asian-Pacific Islanders were higher than for whites (Quan & Cummings, 2003; Quan et al., 2011). These disparities indicate the need to consider cultural, linguistic, and socio-economic factors in the design and delivery of water safety education and drowning prevention programs. Although there have been calls for targeted interventions sensitive to the linguistic needs of populations at increased risk for drowning, examples in the literature of such programs are scarce (Quan et al., 2006; Golob et al., 2013; Moran & Willcox, 2013).

We developed the Water Safety Education and Lifejacket Giveaway Program to motivate safer water behavior among Seattle's culturally and linguistically diverse, low socio-economic communities. This program teaches evidence-based water safety skills and behaviors with an *a priori* consideration of the cultural and linguistic needs of program participants and provides a life jacket free of charge for each parent participant and their child. This article describes the design and implementation of the program, findings from a pilot evaluation, and lessons learned from working with this priority population.

Method

Intervention

Priority Population and Recruitment

The Water Safety Education and Lifejacket Giveaway Program (hereafter the Water Safety Program) was designed for parents of preschool-aged children of low socio-economic status. In King County, WA, this culturally and linguistically diverse population includes many people recently arrived from other countries who

are unfamiliar with local water recreation sites, water safety behaviors, and water safety practices in high-income countries.

Seattle Children's Hospital Community Health collaborated with Head Start early childhood education centers in King County for recruitment and program locations. Head Start is a federally funded community-based program for low-income, at-risk children and families who meet poverty guidelines or other conditions outlined in the Head Start Act (Improving Head Start for School Readiness Act, 2007). Partner Head Start staff was solely responsible for promotion of the Water Safety Program and recruitment of participants.

Water Safety Program Design and Underpinning Theory

The intervention was informed by evidence-based drowning prevention strategies and Fishbein's integrated model of behavioral prediction (Fishbein & Yzer, 2003). Evidence based drowning prevention strategies identified in the literature included lifejacket use; adult and lifeguard supervision; the importance of swim lessons; how to prepare for, and respond to, an emergency in the water; and recognition of local hazards (Branche et al., 2001; Brenner et al., 2009; Cummings et al., 2011; Petrass et al., 2011).

Fishbein's integrated model of behavioral prediction includes components of the health belief model, social cognitive theory, the theory of reasoned action, and the theory of planned behavior (Fishbein & Yzer 2003). From these, norms; self-efficacy and perceived behavioral control; and perceived risk were considered the main variables of a person's intention for a particular health behavior (2003). The integrated model establishes intention, influenced by outside environmental factors, access to resources and one's skills/abilities, as the primary driver of healthy behavior.

It was likely that the priority population for this study included those with, and those without, a formed intention to practice water safety behaviors. Therefore, the Water Safety Program was designed to influence near water behavioral practice both by generating/reinforcing intention to be safer around the water, and by addressing environmental constraints and lack of skills for those who had already formed an intention but were unable to act upon it.

The Water Safety Program consisted of a one-hour education session for parents conducted at Head Start preschool sites, typically in the afternoon when parents attend the venue to collect their children. Head Start has a parent education requirement so families are accustomed to attending educational sessions as part of their child's attendance. The first session was conducted in May of 2012, and subsequent sessions occurred (one per year) in 2013, 2014, and 2015. Three

sessions were held in 2016 (two in May, one in August). Seattle Children’s Hospital Community Health Educators delivered education sessions, with the assistance of interpreters. Educators used small posters with pictures on the front and text on the back, translated into the relevant language, and employed the use of physical demonstration to help convey messages. Components of the education presentation, with corresponding evidence and variables from the integrated health behavior model, are outlined in Table 1. While a short process evaluation was conducted for all sessions, a more detailed pilot evaluation was undertaken for the 2015 and 2016 sessions and these data form the basis of this paper.

Table 1

Topics and Key Messages from Water Safety Education Program

Topics	Key Messages / Activities	Fishbein Model Constructs
Introduction	<ul style="list-style-type: none"> • Children and minorities are at increased risk for drowning (Quan et al., 2003). • Most drownings in the region happen in lakes and rivers (Quan et al., 2011). • There are actions parents can take to reduce risk. 	<ul style="list-style-type: none"> • Behavioral beliefs • Outcome evaluation • Self-efficacy
Supervision	<ul style="list-style-type: none"> • Adults should watch children closely (without using alcohol or being distracted) whenever children are near the water (Blum & Shield, 2000). • It is best to swim in areas with lifeguards (Branch, 2001; Quan, 2006). • Many beaches and pools in Seattle and King County have lifeguards in the summer. 	<ul style="list-style-type: none"> • Behavioral beliefs • Attitudes • Perceived norms • Environmental constraints
Lifejacket Use	<ul style="list-style-type: none"> • Lifejackets should be worn around water by everyone; they save lives and are required by law in some situations (Cummings, 2011; Chung, 2014; Quistberg, 2014, Moran, 2019). • Ensure lifejackets are Coast Guard-approved (<i>demonstration</i>). • Proper lifejacket fit (<i>demonstration and practice</i>) • Local lifejacket loaner programs. 	<ul style="list-style-type: none"> • Normative beliefs and motivation to comply • Skills and abilities • Environmental constraints
Swim Lessons	<ul style="list-style-type: none"> • All children and adults should learn to swim (Brenner, 2003; Asher, 1995). 	<ul style="list-style-type: none"> • Self-Efficacy

	<ul style="list-style-type: none"> • There are free and reduced fee lessons at local facilities. • There are local classes and swim programs for specific groups: teens, adults, parents, all women or all men. 	<ul style="list-style-type: none"> • Environmental Constraints
Local Hazards / Risks	<ul style="list-style-type: none"> • Lakes and rivers in Washington are cold all year round. • Cold water is very dangerous (Tipton, 1989). • Check the depth of the natural water, check for fast moving water, be wary of waves at the ocean, obey signs. 	<ul style="list-style-type: none"> • Self-efficacy • Environmental constraints • Skills and abilities
Responding to an emergency	<ul style="list-style-type: none"> • Recognition of water emergencies. • Do not get in the water to help someone unless you have special rescue training (Moran et al., 2016). • Non-contact rescue techniques. (<i>demonstration and practice</i>) 	<ul style="list-style-type: none"> • Self-efficacy • Perceived norms • Skills and abilities

To address environmental constraints on parental ability to practice intended water safety behaviors, one parent from each family and all children present at the Water Safety Program received lifejackets free of charge. Lifejackets reduce the risk of drowning in recreational boaters (Cummings et al., 2011), and use in swim settings may be protective (Quan et al., 2018). Parents learned how to properly fit the lifejacket, then practiced the skill by fitting lifejackets to their children with the support of community health educators. In addition, participants learned how to make and throw a rescue device and received translated information packets with water safety information that reinforced presentation content.

Pilot Evaluation

The mixed methods, two-part pilot evaluation of the Water Safety Program aimed to (i) identify safe water practices in the priority population; and (ii) determine facilitators and barriers to behavior change. Part one consisted of pre- and post-program surveys administered immediately before and after the education session. In part two, a follow-up phone survey explored changes in reported safe water behavior practices, skills, attitudes, and intentions among participants. Institutional Review Boards at Seattle Children's Hospital and the University of Washington approved the Water Safety Program pilot evaluation.

Part One. The pre- and post-program surveys asked participants questions relating to lifejacket ownership and use; self-reported swim skill level of the adult

participant and their children; water visitation practice relating to lifeguard services; caregiver confidence in keeping children safe around the water; and intentions for water safety behaviors. Both surveys included 10 yes/no questions, read verbally to participants, and interpreted into other languages when necessary. The post-program survey included an additional open answer question asking participants what they intended to do differently as a result of the education session. Interpreters assisted participants in writing their answers for this question if required.

All data were analyzed using RStudio integrated development environment for R (Version 0.96.122) [Computer Software]. Pre-survey data were summarized as descriptive statistics (e.g., mean, standard deviation). Tests for significance of association among language groups and various questions of interest on the pre-program survey were calculated using Fisher's exact test. Odds ratios were calculated using logistic regression.

Part Two. Approximately 8-10 weeks after delivery of the 2016 Water Safety Program, researchers called participants for a telephone follow-up survey. This survey included yes/no and open-ended questions about confidence in keeping children safe as a result of the education session; water site visitation; swim lesson enrollment; and water safety behaviors and knowledge. A professional interpretation service facilitated phone calls for those who did not speak English. Researchers made up to four phone call attempts to reach each participant. Because of the need for telephone interpretation service, researchers did not leave voicemails requesting a call back.

Follow-up phone survey data were summarized as descriptive statistics, and direct quotes from open-ended questions were compiled and summarized. We were concerned about bias by season for one 2016 session that occurred during late summer (August) because opportunity for water site visitations decreased due to weather. Therefore, analysis for affected questions was restricted to the two earlier (May) 2016 sessions. We manually coded qualitative data, linking participant responses to program themes and to Fishbein's integrated model of health behavior prediction. Tests for significance of association for various questions of interest also were conducted.

Results

Part 1 – Pre-Program Survey

The pre- and post-program surveys were collected from adult participants from one 2015, and three 2016 sessions (Table 2). Two pre- and post-survey pairs were not completed or not turned in at the location and excluded from analysis.

Table 2*Language used at home for participants in each pilot evaluation session*

	English	Chinese	Spanish	Vietnamese	Amharic	Total
2015	3	4	2	0	1	10
2016 May (1)	8	14	2	1	0	25
2016 May (2)*	11	17	4	5	0	37
2016 Aug*	18	0	0	0	0	18
Total	40	35	8	6	1	90

*Indicates one missing pre–post test

From the pre-test data, only 16 respondents (18%) reported that their children had lifejackets and 10 (11%) reported that they (parent) had a lifejacket. Even with low lifejacket ownership, 44 parents (49%) reported their children wear a lifejacket when they are in a swimming pool, 38 parents (42%) reported their children wear lifejackets if they are in a small boat, and 26 parents (29%) reported their children wear lifejackets when playing in or near water like a lake or river.

Most parents ($n = 66$; 74%) reported feeling confident keeping their child or children safe around the water, but more than half of parents ($n = 48$; 54%) reported that they did not know how to swim. We found a statistically significant association between self-reported parent swim skill level and confidence of keeping one's child safe ($p = .021$). Those with self-reported swimming skill had four times the odds of feeling confident in keeping their children safe around the water (95% CI 1.205, 13.28).

Language group was associated with (i) parent self-reported swim skill and (ii) parent confidence in keeping children safe around the water ($p < .001$ and $p = .018$, respectively). Compared to those who spoke a different language, English speakers had 4.6 times greater odds of self-reporting swim skill (95% CI 1.846, 11.54), and 3.34 times greater odds reporting confidence in keeping their children safe around the water (95% CI 1.103, 10.4).

For swim lesson history, 32 parents (36%) reported that their children had taken swim lessons in the past. For this group, no significant association was found ($p = 0.38$) between parent language and child swim lessons.

Part 1 – Post-Program Survey

In the post-program survey, over 90% of participants responded “yes” to all questions regarding intention to practice water safety behavior in the future. For example, 82 parents (92%) reported intentions to enroll their children in swimming lessons in the next three months. In addition, for self-efficacy questions, 87

participants (98%) reported feeling more confident keeping their children safe around the water as a result of the education session. They also felt comfortable properly fitting their child with a lifejacket.

The last question of the post-program survey asked participants what they would do differently as a result of what they learned from the Water Safety Program. Unfortunately, 25 (27.7%) of the responses were illegible or unable to be translated. Of those responses we were able to read and translate, 19 parents discussed using/wearing the lifejacket, 14 parents mentioned swim lessons, three parents discussed using learned lifesaving techniques, and three discussed increased supervision/attentiveness around the water.

Part 2 – Follow-Up Phone Survey

Of the 82 adult participants from 2016 education sessions, 41 (50%) successfully completed follow-up phone survey (19 Chinese, 15 English, 5 Spanish, 1 Vietnamese, and 1 Amharic speakers). Of those not completing the follow up survey, eight declined to participate, eight left an illegible phone number or no phone number, four participants' phone numbers had been disconnected, and one participant hung up. Twenty participants did not answer (four phone call attempts were made for each participant).

General Impressions

Those reached for follow-up reflected positive impressions of the Water Safety Program. Many parents expressed gratitude for the education session and lifejackets; one Chinese speaking parent saying she was "very grateful for the lifejacket;" another English-speaking parent said, "the lifejacket is a great help." Several of the follow-up survey participants expressed that they gained knowledge from the program. One Chinese-speaking parent described her experience: "When we were at the program the staff provided a detailed explanation. The materials were (*sic*) passed out were also a great help. I feel like I learned techniques to keep my children safe. Thank you."

Confidence and Water Safety Behavior

All follow-up survey respondents (n = 41) reported they felt more confident keeping their children safe as a result of the water safety program, reinforcing positive responses from the post-program survey. An English-speaking parent stated she felt "more comfortable with the kids in the water. Before I was terrified, but now I feel better with the jacket and with the techniques we learned." Another Chinese-speaking parent said: "Before the program I wasn't very confident to play in the water, but now with the lifejacket and the techniques I learned, I have improved and feel much better about keeping my kids safe in the water."

About half of the parents ($n = 22$; 53.7%) reported they had changed their behavior around the water, and 11 of these described watching their children more attentively. One Chinese-speaking parent described how she watched her children “very close” when they were at the water park and even asked waterpark staff about safety. Another Chinese-speaking parent recalled from the program that children drown within 3-5 seconds, so now she is very careful around the water.

Water Emergency Response

When asked what they would do to help someone who needed assistance in the water, 16 respondents (39%) said they would not get in the water to make a rescue, with 7 (17.1%) clarifying this was because they could not swim. An Amharic speaking parent said, “I would try to reach to the person with another object or pull them by the jacket, but I’m not confident because I have not been trained or ever tried that.” Other common responses are included in Table 3. Several participants mentioned non-contact rescue methods: seven responses indicated reaching to the person with another object, and 13 (31.7%) referenced throwing the person a flotation device. Ten parents (24.4%) specifically mentioned using a plastic milk container and rope as a makeshift throw device, a technique taught and demonstrated in the education session. Seven respondents said they would get in the water to help someone, some expressing they would help because they were “good swimmers.” One English speaking parent said: “I have a first aid certificate so I would get in [the water] and help.”

Table 3

Common responses to question: “If there was someone that needed help in the water, what would you do?” ($n = 41$)

Response	<i>N</i>	%
Get the lifeguard	15	36.6%
Do not get in the water and rescue them	16	39.0%
Throw the person a flotation device	13	31.7%
Use a rope and milk jug	10	24.4%
Enter water to rescue	7	17.1%
Call 911	7	17.1%
Reach to the person with another object	7	17.1%
Get someone else to help	6	14.6%

Lifejacket Use

Analysis of questions concerning post-program life jacket use and swim lesson enrollment was restricted to May 2016 Water Safety Program participants ($n = 35$), the group with greater water visitation opportunities. The remainder of the Results section pertains to this group only.

For these May participants, 22 (62.9%) reported they (the parent or caregiver) had used the lifejacket received at the Water Safety Program, and 29 (82.9%) reported their children had used the lifejacket they received. Parents who reported that they or their children had used lifejackets indicated doing so mostly in lakes (63.6% of parents; 65.5 % of children) and swimming pools (40.9% of parents; 55.2 % of children). There was no evidence of an association between language group and parent lifejacket use or language group and child life jacket use in the follow-up survey data ($p = .726$ and $p = .366$, respectively).

Qualitative results reinforced recognition of the value of lifejackets. Two respondents reported keeping the lifejackets in the car “just in case” they went to the pool or lake. Some survey respondents reflected they learned proper use of a lifejacket; an English-speaking parent said he “remembered to get a Coast Guard approved lifejacket, the one with all the writing on the inside.” Another English-speaking parent stated, “I used to put [the lifejackets] on loose because I did not want to choke or squeeze the kids too tight; now I know how to put the jackets on the kids properly.” A Chinese-speaking parent told researchers she was encouraging others to get lifejackets and to be water safe, but that there were not many resources for Chinese-speaking people. She said, “I am telling all my friends they need to get lifejackets and find water safety information, but it is hard because there are just not many water safety programs in the community, especially for Chinese people.”

Swim Lessons

Seven English speaking and nine Chinese speaking respondents (17 total; 45.7%) reported at least one member of the family had enrolled in swim classes following the Water Safety Program. Of these, 15 (42.9%) reported a child in their family had enrolled in swim lessons, and three (8.6%) reported that an adult had enrolled in swim lessons. For one family, both a parent and child enrolled in lessons. In these follow-up survey data, language was not associated with swim lesson enrollment ($P = 0.131$)

When provided the opportunity for further comments at the end of the follow-up survey, several participants mentioned swim lessons. Two participants described how the Water Safety Program gave them motivation to enroll themselves in swim lessons, one English-speaking parent saying: “I wanted to enroll myself and my children in swim lessons, the program encouraged me to actually do it.” Another English-speaking parent described how her son finished swim lessons and the family was planning to enroll him again next year.

Other respondents discussed why they had not enrolled their children in swim lessons. One Spanish-speaking parent said she tried to get the children into

swim lessons after the Water Safety Program, but there was no space left in the class. An Amharic-speaking participant expressed time constraints as a barrier to enrolling children in swim lessons saying: “I know I need to teach my kids swimming, but I have been so busy with work we haven’t had the chance.”

Discussion

This pilot evaluation uncovered several important facilitators of, and barriers to, success in the implementation of water safety programs for linguistically-diverse communities. First, our partnership with Head Start programs in King County proved to be valuable; it provided direct access to our focus population, which was multi-lingual and of lower socio-economic status, in a setting that was comfortable for participants – their children’s school. By facilitating the water safety presentation and life jacket fitting within the ongoing scheduled parent and caregiver meetings, we were able to avoid logistical challenges of advertising the Water Safety Program and recruiting participants in their already busy lives. Also, the Head Start staff and interpreters were familiar to the participants which seemed to help health educators quickly gain the trust of the participants. Local partnership with the community was essential for coordinating logistics and buy-in from participants.

Our findings confirmed multi-lingual delivery is key to acceptance and adoption of water safe behavior in this community, supporting conclusions from other work in this area (Golob et al., 2013; Quan et al., 2006). Non-English speakers systematically self-reported lower levels of swimming skill and confidence in keeping their children safe around the water. This correlation, coupled with our qualitative findings that there is a lack of multi-lingual water safety programming and information in the community, accentuates an important equity issue and underscores the importance of providing information, programming, and outreach in native languages and in venues that are comfortable and familiar. That participants from this Water Safety Program expressed a desire to share information with others in their community but cited lack of materials or programs in their language as a barrier to doing so, should motivate increased efforts from drowning prevention and public health professionals.

The association between parents’ self-reported aquatic skills, and their level of confidence in keeping their child safe around water is an important water safety finding of this study. It highlights the need to build or reinforce the aquatic skills of parents in addition to promoting learn to swim programs towards children. As the water safety community moves towards water competency-based education for young children (Stallman et al., 2017), including specific programmatic focus on adult parent/caregiver skills and knowledge that reduce risk around the water should be a priority.

The use of Fishbien's integrated model of behavior prediction in the design of the Water Safety Program was helpful for selecting specific variables that influence behavior, in our case, water safety practices. This pilot evaluation found that the Water Safety Program was successful in improving self-efficacy related to basic lifesaving skills such as throwing a flotation device to someone in distress, an important component of the drowning chain of survival (Szpilman et al., 2014). Additionally, parent participants reported they felt confident to fit lifejackets for their children (self-efficacy), expressed frequent lifejacket use and its importance in their recreation (attitude), and specifically recalled presentation content related to lack of supervision (outcome evaluation). Several parents indicated they would not get in the water to help someone else, demonstrating the perceived risk of being an untrained water rescuer. Further, many participants indicated that they would "get the lifeguard" if someone needed help, indicating a family pattern of recreation in lifeguarded swim sites.

Limitations

Lessons from this pilot study relate to the evaluation methods of multilingual water safety programs and the limits of this pilot study. Not only did we experience loss to follow up which may have decreased the validity and reliability of our results, but nearly every parent answered "yes" to questions about learning and intention to practice safer water behavior in the post-program survey. Social desirability bias and/or cultural factors may have led to overwhelmingly positive responses. Previous work has demonstrated that certain cultures stress the need to maintain harmony or save face, especially when a survey environment is not completely anonymous, which may result in socially desirable answers to survey questions (Johnson & Van de Vijver, 2003). Findings from the quantitative analysis of post-program surveys were limited due to lack of variance in responses; however, qualitative data gathered in the follow up interviews provided information regarding facilitators and barriers to behavior change and adoption of safer water practices. Monitoring and evaluation plans of future water safety programs for linguistically-diverse communities should consider these factors. The use of mixed or qualitative methods to derive meaningful data is recommended.

Conclusion

There is a need for water safety programs prioritizing linguistically diverse low-income communities. This pilot evaluation of a water safety intervention in King County, Washington found that non-English speaking parents/caregivers systematically report lower swimming skill and lower levels of confidence in keeping their children safe around the water. In addition, we identified gaps in the availability of water safety materials and programming in non-English languages, confirming the need to offer linguistically diverse programs in this community.

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