Development of an Online Training to Engage Home Visitors as Research Stakeholders

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ABSTRACT

Background: Home visiting (HV) has demonstrated positive impacts across family well-being domains. Home visitors receive training in HV model requirements as well as to develop knowledge and various skills. Despite growth in HV research, we are not aware of existing training or required competencies in research design, research methods, or dissemination of research findings for home visitors.

Objectives: Via ongoing collaboration with an Advisory Board of key HV stakeholders, we developed a three-module online training that incorporated examples from HV research and practice to address the gap in research training for home visitors and to promote home visitors' engagement as research stakeholders.

Methods: A convenience sample of home visitors (n=176) was surveyed on research knowledge, research self-efficacy, and priority training topics, with results used to create a beta version of the training completed by six home visitors. Home visitor feedback on the beta version, coupled with Advisory Board recommendations, led to creation of the final online training. Forty home visitors viewed the final training and completed pre- and post-training surveys to assess changes in research knowledge and self-efficacy. Twelve home visitors also completed a semi-structured qualitative interview. Home visitors demonstrated improvements in research knowledge and self-efficacy and found the training easy to understand and useful.

Conclusion: Guidance from stakeholders led to development of an online training that was effective in improving home visitors' research knowledge and self-efficacy. This training can be used by HV researchers and practitioners as a tool to promote home visitors' active engagement as stakeholders in research.

KEYWORDS: home visiting, workforce development, research training, community engaged research, stakeholder engagement

Introduction

Home visiting (HV) provides critical services to pregnant people and new parents with the goal of improving parent and child health outcomes, especially among vulnerable populations who may experience health inequities. Evidence-based HV models have demonstrated significant impacts in eight crucial family well-being domains.[1] HV programs are active in every state, the District of Columbia, five U.S. territories, and among 22 Indigenous communities.[2]

Evidence-based HV models employ individuals with a range of educational backgrounds: 75% of U.S. home visitors have a bachelor's degree in nursing, social work, or education, while 25% have an associate's degree, high school diploma or GED; comparatively, the majority of HV supervisors have a graduate degree (43%) or bachelor's degree (47%).[3,4] While some HV models employ nurses or social workers, many employ lay home visitors who can be conceptualized as community health workers with training and experience in perinatal health and/or early childhood development; typically from the community where HV services are delivered, home visitors often share similar cultural backgrounds with clients.[5] Home visitors receive training in HV model approaches and requirements, as well as training to increase knowledge and skills to support child development, positive parenting practices, and parent and child mental health.[6,7]

HV research examines model effectiveness, implementation of HV services with special populations, and targeted approaches to address specific client and family needs. The Home Visiting Applied Research Collaborative (HARC), a practice-based research network, stresses the importance of participatory approaches to strengthen HV research through active engagement between HV stakeholders and researchers.[8] While some HV research has involved home visitors as stakeholders, most projects primarily engage HV managers. This exclusion of home visitors as stakeholders is a limitation of existing HV research--their perspectives and contributions are vital to shape impactful research. To our knowledge, no evidence-based HV model requires research competencies or provides training in research design, research methods, or patient-centered outcomes

research.[6,9,10] Research indicates that recruitment and retention of home visitors requires more attention to professional development, support for a collaborative culture, and resources to assess the quality and share the impact of their work.[5] Barriers to home visitors' engagement in research include limited research training, knowledge, self-efficacy, and support for research engagement. Additionally, home visitors may not engage with researchers due to lack of HV researcher engagement with the HV workforce. This limited involvement of home visitors as research collaborators may adversely affect the development of contextually appropriate research and intervention strategies.

To address the gap in HV research training and promote impactful HV research, we secured funding through an Engagement Award from the Patient-Centered Outcomes Research Institute to develop an online HV research training. While other research trainings exist for community stakeholders,[11] we are unaware of any that focus on developing the research capacity of home visitors to promote the health and well-being of parents and children through research. Therefore, our goal was to develop a training unique in its direct linkage to HV practices and contexts, including relatable examples drawn from HV program evaluation practices, research literature, and expertise of key HV stakeholders. To guide this work, an advisory board (AB) consisting of HV researchers, managers, and direct service staff was established; the contributions are described throughout. This manuscript describes the development of our online home visitor research training, the process and contributions of AB members, and findings from a pilot study evaluating the training's effectiveness to increase home visitors' research knowledge and self-efficacy.

Methods

Community-Academic Partnership

This was a two-year (2019-2021) collaboration between researchers at Northwestern University and key HV stakeholders from several regions in the U.S. A 12-person AB was established, consisting of two HV model developers, two HV researchers, two HV managers, four home visitors, and two HV clients. AB members had

either collaborated with the research team on previous studies, were connected with a HV program that had partnered in research, affiliated with national HV models (e.g., Healthy Families America, Parents as Teachers), or led HV research projects. One HV client who initially committed to the AB was not able to participate in any AB meetings or provide feedback via email, due to a career change during the project period. The research team made several attempts to recruit an additional HV client to the AB but were ultimately unsuccessful.

Table 1 outlines the timeline for this project, including how AB members were engaged throughout different phases. The AB met twice per year and assisted in (a) developing training topics and content, (b) finalizing the aesthetic, and (c) reviewing and interpreting data from the beta testing and pilot study. We established an executive committee (EC) with three AB members who represented different types of HV stakeholders (one former HV manager, one HV researcher, and one home visitor) to work alongside the research team providing feedback and direction. EC members attended all AB meetings and four additional meetings per year. AB members were compensated $125 per meeting, and EC members were compensated $142 per meeting. All meetings took place virtually via Zoom. Meetings were guided by agendas the research team created that aligned with the study timeline. In instances requiring decisions, the research team would introduce the topic and encourage open conversation among AB members. Polls were emailed to members following the meeting to support decision making. AB members were integral in providing feedback and informing training content to ensure its relevance and utility for the HV community. An AB member, who is a HV program manager and research collaborator, coauthored this manuscript.

Development of Training

Project partners developed a beta training, informed by survey data obtained from a convenience sample of home visitors (N=176), recruited through an email invitation sent via the HARC listserv. Surveys assessed home visitors' research knowledge, research self-efficacy, and identified priority topics and focus areas for the training. Survey results were shared with the AB who helped interpret findings and prioritize training content

and approaches. AB members shared their experiences while reflecting on survey results to guide development of the beta training. For example, the HV research examples and animated video stories integrated in the modules were suggested by AB members and were drawn from lived experiences in HV or research.

Six home visitors from the convenience sample were recruited to test the beta training. After providing informed consent, participants completed a pre-training survey, viewed the training within two weeks, and completed post-training surveys within another two weeks of training completion to assess research knowledge and research self-efficacy, and a subset participated in semi-structured interviews that asked about training aesthetics and recommendations to improve the training. Interviews were transcribed, compiled, and shared with AB members who also viewed the training and provided feedback. Our AB members with HV experience were especially helpful as they reflected on their own HV and early childhood trainings to make suggestions or critiques to the content and aesthetic of the training. Table 2 lists AB contributions that influenced pedagogical approaches.

The final online training is called "Home Visitor Research Connection" and consists of three 20-minute modules: 1) research design, 2) research methods and 3) sharing research findings. Each module includes video interviews with HV staff, clients, and researchers sharing their experiences, animated videos depicting key concepts, and a short quiz to reinforce main concepts. The training can be paused, allowing a self-guided pace for participants. Topics and examples were contextually-based throughout the training to ensure content was relevant for home visitors (Table 3). Module one introduces research design by describing different ways research studies can be designed to assess HV engagement with first-time mothers, changes in social support related to HV participation, and breastfeeding experiences. Module two discusses existing practices in HV data collection that frequently align with research study methods and aims--for example, HV impact on gains in parent knowledge about child development. Module three describes various ways study findings can be shared depending on stakeholder audience (e.g., clients, communities, funders, policymakers, community partners).

Pilot Testing of Online Training: Participants

We recruited 40 home visitors to complete the training and pre- and post-training surveys to assess changes in research knowledge and research self-efficacy (Table 4 for participant demographics). Participants (N=176) from the convenience sample were emailed a flyer about the pilot study. Home visitors interested in participating emailed the study coordinator, who sent a Research Electronic Data Capture (REDCap) survey link including informed consent, screening, and baseline assessments.[12,13] Of these 40 participants, 12 were randomly selected to complete a qualitative interview after training completion. Participants from the beta training were ineligible for this phase of the study.

Pilot Testing of Online Training: Measures and Data Collection Procedures

Study participants completed a pre-training survey assessing demographics, ten questions on knowledge of research design and methods (true/false), and nine questions assessing research self-efficacy to assess comfort engaging in research activities, using a 5-point Likert scale *(1=Very Comfortable; 2=Comfortable; 3=Neither; 4=Uncomfortable; 5=Very Uncomfortable)*. After completing the pre-training survey, home visitors were asked to view the training within two weeks, followed by a post-training survey within two weeks of completion. The post-training survey included the same questions as the pre-training survey and asked about the usefulness and enjoyment of the training. Pre- and post-training surveys were developed collaboratively with the EC. All survey data were collected and managed using REDCap.[12,13]

Twelve participants randomly selected for semi-structured interviews completed 15-minute interviews via Zoom within two weeks of completing the post-training survey. Interviews were conducted by the study coordinator, recorded, then transcribed to ensure accuracy. The interview guide focused on six areas: 1) training comprehension, 2) training enjoyment, 3) training topics and content, 4) visual media, 5) acceptability, and 6) suggested modifications (Table 5).

Study participants received gift cards for completing the pre-training survey ($15), the post-training survey ($30), and the semi-structured interview ($40). All study procedures were approved by the Northwestern University institutional review board.

Pilot Testing of Online Training: Data analysis

We conducted descriptive analyses indicating the percentage of participants who correctly answered each research knowledge question and the percentage of respondents who correctly answered ≥9 of the questions. We calculated the percentage of participants who indicated comfortable/very comfortable in response to research self-efficacy questions and the percentage who indicated they were comfortable/very comfortable on ≥8 of the questions. A within-subject score averaging all research knowledge and self-efficacy responses, respectively, was created for each participant, which were used to create an overall sample mean knowledge and self-efficacy score at each timepoint. We compared percentages between pre- and post-training timepoints, using a linear mixed model with repeated measures, treating timepoint as a fixed effect and participants as a random effect to account for varying baseline levels. We adjusted the model for these covariates: HV employment years, education level, and HV program model. Significance was evaluated via the adjusted Wald Type III test for significant effect at the 5% level of significance. Statistical analyses were performed using R Statistical Software (version 1.3.1073).[14]

Qualitative analysis was conducted using agreed upon procedures for deductive analysis. The study coordinator reviewed interviews and generated themes related to participant responses to each interview topic (e.g., training comprehension and acceptability, visual media, recommendations), developing a database of thematically organized quotes, which were related to each interview topic. Thematically organized responses were reviewed by the research team and AB.

Results

Pre/Post-Training Surveys

Descriptive (item) analysis found increases in research knowledge for eight of ten items, with no changes in knowledge for the other two questions (Table 5). There was a marginally statistically significant increase in the percentage of participants who answered ≥ 90% of the research knowledge questions correctly over time, from 52.5% pre-training to 72.5% post-training (X^2 (1, N = 40) = 4.6 ($p < .05$). There were no significant interactions between time as a home visitor, education level, or HV model with research knowledge gains.

Descriptive (item) analysis found increases in research self-efficacy for seven of nine items, with the largest increases in helping to develop procedures and protocols and reviewing results and developing dissemination materials, closely followed by participating on ABs or as a research consultant (Table 6). Prior to completing the training, 37.5% of home visitors reported feeling comfortable or very comfortable with ≥ 8 of the 9 research self-efficacy questions, with this percentage increasing to 55% post-training. This increase in research self-efficacy was not statistically significant X^2 (1, N = 39) = 3.4 ($p = .07$), and no significant interactions between time employed as a home visitor, education level, or HV model with increases in research self-efficacy. There was little change in already high levels of home visitor self-efficacy in participant recruitment, data collection, and question development activities. We saw small improvements in self-efficacy to review data and results, along with larger increases in self-efficacy to develop research materials and disseminate research findings. Following training, 75% of HV respondents indicated feeling comfortable or very comfortable developing research procedures to integrate an intervention study into their HV practice and setting, compared with 57.5% pre-training. Respondents indicated they were more likely to participate as an advisory board member or consultant, with slight increases in the percentage of respondents who indicated they felt they would be comfortable in such a role.

Interviews

Main themes across interview domains, examples of questions, and direct quotes are found in Table 5. Home visitors indicated the training was easy to understand. Others appreciated various ways to share study findings depending on audience. Home visitors valued learning about how different research design and data collection methods can be used depending on research goal. Respondents enjoyed hearing HV staff and client perspectives from the interview videos. Overall, the training was considered very acceptable among home visitors regardless of experience. Many of the suggested modifications were related to increasing accessibility, including Spanish translation and closed-captioning in both languages.

Discussion

Guided by HV stakeholder feedback, we developed a training for home visitors providing key concepts related to research design, research methods, and sharing study findings, within the context of HV. This training is distinct from other research trainings for community stakeholders in its maternal and child health and HV practice foundation. Baseline research knowledge was high among some home visitors who participated in the training. Training participation led to significant improvements in research knowledge and some improvements in research self-efficacy, albeit not statistically significant.

This training is the first to focus on developing home visitor capacity to engage in research. While home visitors receive initial onboarding and periodic trainings strategies to promote client engagement and specific health topics (e.g., breastfeeding, depression), no existing HV training focuses on research design, methods, or dissemination of findings. This training is timely, given the rapid increase in funding for HV across the U.S. and HV research examining implementation, effectiveness, precision, and innovation. We anticipate this training can be used by HV models, HV systems (e.g., state networks), training and consultation networks and HV programs to increase home visitors' research knowledge and self-efficacy. In turn, we believe that home visitors will feel comfortable more actively engaging with researchers in developing and implementing HV research and HV researchers will have an effective stakeholder engagement tool. Without home visitor perspectives, research

and intervention studies conducted in HV are likely to neglect important contextual and cultural considerations given that home visitors have a unique perspective on how HV services are delivered, and the characteristics of families served by HV. This training may also help home visitors become more efficacious in their organizational internal research and quality improvement activities.

Limitations and Future Directions

While this project demonstrated success in developing a training that was well-received by home visitors and effective in improving research knowledge and self-efficacy, AB members identified some limitations and potential future directions. First, further training evaluation should be conducted with larger groups of home visitors, prioritizing inclusion of more diverse racial and ethnic backgrounds, to ensure generalizability of the training's acceptability and effectiveness. Second, our AB suggested strategies to increase training accessibility—specifically, translating the training into Spanish and adding closed captioning. Third, our AB suggested developing a fourth training module presenting case examples of HV studies that highlight key research methods, research design, and dissemination activities. This fourth module is intended to tie together key concepts from the three current modules and focus on areas where we saw fewer improvements related to home visitor self-efficacy and knowledge. While one reason for the limited improvement in some self-efficacy and knowledge questions relates to high baseline levels that did not allow for much improvement, it is also possible that some constructs require additional reinforcement and explanation within a fourth case study module.

To address these limitations, we obtained a follow-up PCORI Engagement Award that will fund Spanish translation, closed captioning, development of a fourth HV research study module, and evaluation with a larger, more diverse group of home visitors. Additional goals include disseminating the training to HV stakeholders nationally. Dissemination efforts will be multi-faceted, encouraging HV models and programs to utilize the training as part of their standard training and that HV researchers utilize the training as part of their engagement

process during early stages of research development and collaborations. This follow-up project will engage community stakeholders, continuing AB members, and new home visitor AB members whose feedback informed these next steps.

Conclusions

While our training was developed for lay home visitors, we believe it will be widely applicable to lay and professional (e.g., social workers, nurses) home visitors, given the lack of systematic research training that exists. Our training provides a brief, accessible, and contextually-relevant training tool and pathway to support capacity building and bi-directional engagement between HV researchers and home visitors, as recommended.[15] HV researchers, model developers and trainers, can more actively engage home visitors by supporting capacity building in this area and developing a collaborative culture between researchers and home visitors throughout all stages of the research process. Benefits of participatory approaches to HV research can include ensuring cultural fit and acceptability of research methodology, increasing knowledge and capacity to achieve shared goals through research collaboration, as well as strengthening outcomes and sustainability of practices within HV service systems.

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Table 1. Project Timeline

2018	**June**	**NU team engaged with community stakeholders to identify support and interest in project development**. NU team continued to consult community stakeholders throughout development of proposal, protocol and survey content development.
	December	Formal submission of grant application
2019	**May**	Notice of Award received by NU Team
	July	Recruited Convenience Sample and administered surveys via the HARC Network Began EC Meetings
	August	Reviewed data from baseline surveys; obtained recommendations on training topics and content and reviewed order of material for the online training
	September	Began AB Meetings; shared survey data and recommendations with AB
	October	Finalized training outline with feedback and recommendations from AB
	November	Met with Learning Management System (LMS) Developer and Next Day Animations to begin creation of Beta Training and animated videos
2020	**January-February**	Reviewed Beta Training and animated videos with EC/AB
	April	Finalized Beta Training and recruited HV participants (n=6)
	June	AB/EC viewed Beta Training; HV participants viewed Beta Training and completed post-training quantitative and qualitative surveys
	August	NU Team compiled survey data; reviewed results with AB/EC
	September	Finalize recommendations for Pilot Training based on feedback received from AB/EC and HV participants
	October-December	Revised training based on discussion with AB/EC and survey results
2021	**January**	Tested viewability of Final Training internally
	February	Recruited HV participants (n=40) to view final training
	March	HV participants viewed training, completed pre/post surveys and qualitative interview
	April	NU Team compiled pre/post survey results and disseminated findings to AB/EC Identified need for follow up project; NU Team submitted Letter of Intent to PCORI to implement revisions and create dissemination plan

Table 2. Examples of AB contributions

Training Duration	The AB proposed the training be divided into 3, 20-minute segments versus the suggested 3 hours from the research team. This proposal from the AB was influenced by many members personal experiences completing HV trainings.
Inclusion of multi-media	AB members highlighted the importance of including different learning modalities, such as animation, video interviews, audio, visual and written content on slides to ensure material was accessible for different types of learners as well as engaging.
Interview topics and questions	AB members ultimately determined topics and questions for the video field interviews with HV staff, manager, client, researchers, and research staff.
Selection of examples presented throughout training	The case examples used to demonstrate possible research questions, research design, and means of collecting data in the field were suggested directly by the AB. Many examples used in the training are related to breastfeeding, mental health and reading in early childhood.
Animated videos	AB members were asked to contribute to the script, settings and characters used in the animated videos.

Table 3. Main topics in each module of the Home Visitor Research Connection online training

Module 1 **Research Design**	**Module 2** **Research Methods**	**Module 3** **Sharing Research Findings**
What is research?	Intro to quantitative and qualitative methods	Using research findings
Video: How research impacts home visiting	Types of quantitative methods used in home visiting (e.g., surveys, program data)	Data analysis: Quantitative data
Steps in the research process (e.g., research question, hypothesis, literature review)	Types of qualitative methods used in home visiting (e.g., interviews, focus groups, observations)	Data analysis: Qualitative Data
Approaches to design a study (e.g., exploratory, descriptive, causal)	Video: Research Methods	Home visitors as stakeholders in research
When to collect data (e.g., single or multiple timepoints)	Ethics in Research and Home Visiting	Video: Sharing Findings with your community
Understanding your knowledge	Three Principles of Research Ethics	Stakeholder engagement
	Randomization in Research Studies	

Table 4. Demographics of home visitor participants in pilot study (N=40)

Characteristic	N (%)
Race	
Black/African American	3 (7.5)
White/Caucasian	27 (67.5)
Native American	2 (5)
Other	5 (12.5)
Home Visiting Model	
Healthy Families America	16 (40)
Maternal Early Childhood Sustained Home-Visiting Program	1 (2.5)
Parents as Teachers	8 (20)
Early Head Start – Home Based Option	13 (32.5)
Other	2 (5)
Highest Education Level Completed	
High school graduate	2 (5)
Some college credit – no degree	5 (12.5)
Trade/technical/vocational degree	2 (5)
Associate degree	5 (12.5)
Bachelor's degree	26 (65)
Time Working in Home Visiting	
Less than one year	4 (10)
1-2 years	6 (15)
3-5 years	17 (42.5)
6-10 years	9 (22.5)
11-15 years	2 (5)
More than 15 years	2 (5)

Table 5. Qualitative interview domains with illustrative quotes from home visitor participants (N=12)

Interview Domain	Illustrative Quote(s)
Training Comprehension *Was any of the training content difficult to understand or too simplistic?*	"The training was at a good level for everyone to understand. Whether you are a new home visitor or have been in the field for a while, it's definitely useful for anyone."
Training Enjoyment *What topics did you enjoy most?*	"Before this training, I didn't know results could be shared in different ways depending on the audience. It was so empowering to find out that since I'm doing this job, I am a stakeholder in the research studies I participate in."
	"They showed examples of how and why research was important and the impact it can have, especially in showing parents the significance of participants in home visiting and surveys. That part of connecting the dots between collecting data and the sharing of results was really useful and not something we are usually told before now."
Training Topics and Content *What training topics were most valuable to you in terms of gaining new information?*	"The differences between data and the different ways it can be used depending on your goal was new to me. This gave me the background and opened the doors to more awareness of research and why it happens and is important."
Visual Media *What did you like about the visual presentation of the training content?*	"I would say all of it. I liked the videos because the real-life component gave a more well-rounded view. But I liked the slides too because the text wasn't overly informative or overwhelming. It was also a good guide to kind of follow along with as I was listening to the slides as well."
Acceptability among Home Visitors *Share some reasons why, or why not, you think this training would be well-received by other home visitors.*	"Anyone, regardless of experience, can benefit from this training. It opened my eyes to the different things that funders need from us in order for us to get money from those funders. They need to know things, from our research participation and data collection, in order for us to get money for change, which can be really important when we are working in the communities we are."
Suggested Modifications *What other recommendations do you have to improve the training?*	"More information on a general timeline when you do research would be helpful. I understand it can depend on the type of research you are doing, but I don't remember any kind of example or how long it may take to conduct interviews…. Adding a module that shows an example study from start to finish would be helpful."
	"Have closed captioning on the screen if possible. I personally like to read along with everything and I'm partially hard of hearing, so I always read to feel like I'm better understanding it. Also, if Spanish translation isn't possible, Spanish captions would be helpful."

Table 6. Pre- and post-training research knowledge and self-efficacy among pilot study participants (N=40)

Research Knowledge	**Pre-Training (% correct)**	**Post-Training (% correct)**
Overall		
≥9 questions correct	52.5	72.5
Survey Items		
1. A hypothesis is proposed at the end of a study, after reviewing all of the results.	72.5	90.0
2. The number of documented home visits entered in a database is an example of data or information that could be used in a study to learn more about home visitation rates across the country.	97.5	97.5
3. Participants in a control group receive the same service, intervention, or treatment as participants in an intervention group.	77.5	80.0
4. Participants in an intervention group receive a specific service, intervention or treatment so that the researchers can study its effects.	92.5	95.0
5. Interviews and open-ended questions are examples of quantitative data/information.	65.0	82.5
6. Qualitative data/information can be collected by conducting interviews with participants.	90.0	92.5
7. A study protocol is used to outline the best practices and standard operating procedures that should take place during a research study.	92.5	92.5
8. Dissemination means storing information about a study and not sharing it with anyone.	80.0	87.5
9. In the context of research, bias refers to intentional or unintentional influence that a researcher may have on a study.	97.5	100.0
10. In the context of research, a variable refers to something that always stays constant.	80.0	85.0
Research Self-Efficacy	**% Comfortable or Very Comfortable Pre-Training**	**% Comfortable or Very Comfortable Post-Training**
≥8 survey items	37.5	55.0
Survey items		
How comfortable would you feel taking part in the following activities related to a research project?		
1. Help with recruitment of home visiting clients in a research study?	85.0	85.0
2. Help collect information or data from home visiting clients (e.g., administer surveys, conduct interviews, facilitate focus groups)?	92.5	90.0
3. Help develop questions and/or decide on questions that would be asked during a research project?	77.5	80.0
4. Help develop procedures or protocols for how a research project is implemented (e.g., help create outreach guidelines)?	55.0	67.5

5. Help develop procedures or protocols for a research project that integrated an intervention/service into your home visiting program?	57.5	75.0
6. Review the results/information/data from a research project?	75.0	85.0
7. Develop materials to assist with sharing research project results?	55.0	72.5
8. Serve on an advisory board for a research project?	47.5	60.0
9. Serve as a consultant (paid or unpaid) for a research project?	50.0	62.5

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