

Evidence-Based Intervention to Reduce Access Barriers to Cervical Cancer Screening Among Underserved Chinese American Women

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Abstract

Objective: The primary objective of the present study was to evaluate the effects of a community-based pilot intervention that combined cervical cancer education with patient navigation on cervical cancer screening behaviors among Chinese American women residing in New York City.

Methods: Chinese women ($n = 134$) who had not had a Pap test within the previous 12 months were recruited from four Asian community-based organizations (CBOs). Women from two of the CBOs received the intervention ($n = 80$) consisting of education, interaction with a Chinese physician, and navigation assistance, including help in identifying and accessing free or low-cost screening services. The control group ($n = 54$) received education delivered by Chinese community health educators and written materials on general health and cancer screening, including cervical cancer, the Pap test, and information about sites that provided free screening. Study assessments were obtained in-person at baseline and postintervention. Screening behavior was self-reported at 12-month postintervention and verified by medical staff.

Results: In the 12-month interval following the program, screening rates were significantly higher in the intervention group (70%) compared to the control group (11.1%). Hierarchical logistic regression analyses indicated that screening behavior was associated with older age (OR = 1.08, 95% CI = 1.01–1.15, $p < .05$). In addition, women with poorer English language fluency (OR = 0.30, 95% CI = 0.10–0.89, $p < .05$) and who did not have health insurance were less likely to obtain screening (OR = 0.15, 95% CI = 0.02–0.96, $p < .05$). Among health beliefs, greater perceived severity of disease was positively associated with screening behavior (OR = 4.26, 95% CI = 1.01–18.04, $p < .05$).

Conclusions: Community-based programs that provide combined education and patient navigation may be effective in overcoming the extensive linguistic and access barriers to screening faced by Chinese American women.

Introduction

ALTHOUGH THE INTRODUCTION OF THE PAPANICOLAOU (PAP) TEST has contributed to a dramatic decrease in cervical cancer incidence and mortality in the general U.S. population, disparities remain among ethnic minority groups in which Pap test utilization rates are low. Indeed, a number of studies have reported that Asian American women are less likely to obtain a Pap test compared to Caucasian women.¹ When outcomes are examined further according to specific Asian subgroup, data suggest that Chinese women residing in

the United States have higher rates of cervical cancer than the general North American population.² In addition, survival rates after diagnosis of early-stage cervical carcinoma are lower in Chinese women in the United States compared to other Asian and non-Asian populations, including Japanese, Filipino, and non-Hispanic white women in the U.S.³

Cervical cancer is preventable by early detection of precancerous lesions during screening. The relatively high incidence rates observed among Chinese American women is likely due to low uptake of cervical cancer screening in this population. A previous study reported that 19% of Chinese

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American women residing in Seattle had never received screening, and 36% of Chinese American women had not been screened in the past two years.⁴ Similar low rates of screening were observed in a more recent study of Chinese immigrants living in Seattle,⁵ as well as among foreign-born Chinese women residing in or around Portland and non-English-speaking Chinese women in the San Francisco Bay area.^{6,7} Recent studies by Ma and colleagues indicated that 28% of Chinese women in the Pennsylvania, New Jersey and New York City areas had never received a Pap test.^{8,9}

Due to the low screening rates, it is important to begin to identify the factors that may contribute to cervical cancer screening in this population. Sociodemographic factors associated with screening have been reported to include marital status (e.g., being currently or previously married), owning a home, higher levels of education, having health insurance, having received a physician's recommendation, having obtained obstetric services in North America, having a regular healthcare provider, availability of culturally sensitive healthcare services, younger age, and younger age at immigration.^{4,5,10} Finally, multiple studies have found that non-English speakers and immigrants are less likely to obtain screening tests than the general U.S. population because of language and access barriers.^{4,10-12} Ma and colleagues found that those Chinese living in the U.S. less than 15 years were more likely not to ever have been screened than those living in the U.S. more than 15 years (38.1% vs. 17.2%, $p < 0.01$).⁹

In addition, various health beliefs have been associated with screening behavior. For example, women who endorsed the belief that a Pap test is necessary for sexually inactive women, that Pap testing prevented cancer, and who were less concerned about embarrassment were more likely to obtain screening. On the other hand, a lack of general knowledge about the Pap test, cultural beliefs about modesty, and concerns about pain/discomfort from the test were negatively associated with screening.^{6,10} Further, Hislop and colleagues found that, in general, knowledge about cervical cancer risk factors was low among Chinese American women.¹³ Research on Chinese immigrants in Seattle revealed that less than half of the study population was aware of cervical cancer risk factors.^{14,15}

Results of these studies indicate that a number of factors may influence uptake of cervical-cancer screening among Chinese American women and that barriers to screening are numerous and varied. In an effort to overcome barriers to screening, Taylor and colleagues conducted a randomized trial evaluating two interventions.¹⁶ In one intervention, Chinese American women were given "high-intensity" outreach care, in which they received Chinese-language educational materials, tailored counseling delivered by a trilingual (Cantonese, Mandarin, and English) Chinese outreach worker during a home visit, and logistical assistance as necessary (e.g., assistance with appointment scheduling, medical interpreter services during clinic visits, transportation assistance). The "low-intensity" intervention arm consisted of a direct mailing of the Chinese- and English-language materials (education-entertainment video, motivational pamphlet, educational brochure, and a fact sheet) that were provided in the "high-intensity" intervention. A third group of women were randomized to a control condition receiving usual care. At 6 months postrandomization, followup assessments indicated an increase in screening among all study groups: 39% of

women in the "high-intensity" outreach group, 25% in the "low-intensity" direct-mailing arm, and 15% in the control group received screening between randomization and followup; but overall screening rates remained low.¹⁶ The authors contend that lack of access remained a significant barrier to screening in this population. These findings suggest that in addition to the logistical assistance offered by the outreach workers, there is a need for greater navigation services, particularly with respect to helping women identify state- or federally funded programs that provide free or low-cost cancer screening and prevention services for underserved women.

Thus, although interventions that target women's health beliefs can lead to increases in screening rates, the effectiveness of such interventions is likely to be attenuated if access barriers are not adequately addressed.¹⁷ Access barriers, including cost of screening, lack of insurance, and language difficulties, pose formidable challenges and are the most often cited factors influencing screening behavior.¹⁸⁻²⁰ It is well established that women who do not have health insurance or lack a regular source of healthcare are less likely to receive a Pap test than women who have insurance or a primary care provider.^{20,21} Although there are a number of programs available that provide low-cost or free cancer-screening services, Chinese American women are often unaware of these services or face considerable barriers to accessing such programs. Therefore, in this medically underserved population, there is a need to develop comprehensive approaches to help women obtain cervical cancer screening.

Guided by an overarching framework that combined elements from the Health Belief Model (HBM) and Social Cognitive Theory (SCT), we developed an intervention program to target both individual- and system-based factors that contribute to screening behavior in this population.²²⁻²⁶ A number of studies have demonstrated that interventions emphasizing the application of these constructs can be effective in improving not only knowledge about cancer-screening behaviors, but also adherence to recommended screening.²⁷ In addition, based on findings from previous studies, the intervention program was designed to provide not only logistical assistance (e.g., help with scheduling appointments and transportation assistance) but also navigation help (e.g., how to access medical care without insurance, identifying clinics that provide free- or low-cost screening, negotiating with the clinic for reduced fees or a payment plan) in accessing free or low-cost screening when requested.¹⁶ Thus, the purpose of the present study was to evaluate the effects of this comprehensive intervention on cervical-cancer screening rates among underserved Chinese women. It was hypothesized that participation in the intervention would be associated with increases in both knowledge and cervical-cancer screening rates.

Materials and Methods

Participants

Chinese women ($n = 134$) were recruited from four Asian community-based organizations (CBOs) in New York City. Each of these CBOs is located in a Chinese community and serves predominantly a low-income, uninsured, and recent immigrant population. Exclusion criteria included <18 years of age, a current diagnosis of cervical cancer, and a Pap test

within the past 12 months. This screening criterion was chosen because the American College of Obstetricians and Gynecologists (ACOG) recommends annual cervical cytology testing for women up to age 30. For women ages 30 and older, annual cervical cytology testing is recommended as one of three possible screening options. Informed consent was obtained from each participant.

Study design and procedures

The pilot study utilized a two-arm, quasi-experimental design with four CBOs, two of which were assigned to receive the intervention and two that served as the control group. The characteristics of the intervention and control CBOs were compared and balanced before assignment. Since this pilot study was designed to detect the feasibility and effect evidence, the randomization method was not used. Participants from both intervention and control groups were recruited in a similar approach, consented to voluntary participation, and met the eligibility criteria.

Community leaders were involved in the development and pilot testing of program content and procedures. Women in the control group ($n=54$) received two health education sessions delivered by trained Chinese community health educators. The health education sessions, which were delivered in a small-group format to approximately 15 participants in each session, covered topics on general health and cancer education, including tobacco, nutrition, regular medical checkups, and cancer screening (e.g., cervical, breast, and colon-cancer screening). In addition, control participants received written materials on general health and cancer-screening guidelines, including cervical cancer and the Pap test, as well as information about healthcare sites that provided free cervical-cancer screening. Participants were encouraged to visit their healthcare providers for screening. Delayed intervention was also provided to the control group after its followup assessments.

Intervention group participants ($n=80$) also received two small-group education sessions conducted by trained Chinese community health educators. The two education sessions were designed to increase knowledge and enhance attitudes toward cervical-cancer screening. Specific program content focused on cervical-cancer risk factors, prevalence rates, and the benefits of screening and early detection, particularly in relation to the life roles of Asian women (e.g., social norms and family responsibilities). The HBM was used as a primary conceptual model for developing program messages addressing key barriers and health beliefs that lead to low cervical-cancer screening among Chinese women. The SCT model was used as a secondary framework for delivering the intervention to the Chinese community and emphasized the dynamic interactions among appropriate personal, behavioral, and environmental factors that lead to learning and improved behavior. To increase self-efficacy, health educators utilized activities such as helping participants with goal setting and using culturally and linguistically appropriate videos to model and reinforce positive attitudes and behaviors. The intervention group also participated in an open discussion with a Chinese-speaking physician who addressed concerns and questions related to cervical cancer. Handouts on cervical cancer and the Pap test and a Chinese-language video on the subject were also presented. Finally, the program not only

addressed group-specific health beliefs and psychosocial barriers to screening, but also adapted the patient navigation concept for preventive care. Intervention participants received information about healthcare sites that provided free cervical-cancer screening, including designated Healthy Women Program screening sites. In addition, patient navigation assistance in arranging Pap test appointments, language translation, transportation assistance, and paperwork for obtaining free or low-cost screening was provided upon request to the intervention participants.

In both intervention and control conditions, study assessments were obtained at baseline and postintervention in person. Screening behavior was assessed at 12 months post-education by telephone interview, with a study completion rate of 99% (79/80) for the intervention group and 85% (46/54) for the control group participants.

Measures

Study assessments were developed in English, translated into Chinese, and back-translated to English to ensure equivalence. The Chinese language version was then pre-tested for acceptability of comprehension, and any necessary modifications were made.

Demographic items. Age, marital status, education, country of birth, and English language fluency were obtained at baseline.

Healthcare access and barriers. Participants reported whether they had health insurance, a regular healthcare provider, and had obtained prior Pap tests.

Knowledge and health beliefs. Women's knowledge of cervical-cancer risk factors and possible symptoms of cervical cancer were assessed at baseline and posteducation. To reduce participant burden, only a brief assessment of health beliefs was obtained by eliciting participant responses. Perceived susceptibility of developing cervical cancer was assessed with the item "I feel I will get cervical cancer sometime during my life." Perceived severity was assessed with the item "My whole life would change if I had cervical cancer." Perceived benefit of screening was assessed using the item "Having a Pap test is the best way for me to find cervical cancer early." Responses to belief items were drawn from previous research^{24,28,29} and scored on a 5-point Likert-type scale ranging from 1 ("Strongly disagree") to 5 ("Strongly agree").

Outcome measures: Pap-testing behavior. Self-reported screening behavior over the past year was obtained at 12 months posteducation. Receipt of a Pap smear in the past year was verified among those participants who indicated that they had undergone screening, each of whom signed and returned a medical-release consent form. Health providers were identified by participants, and the signed medical release consent forms were faxed to the respective facility where screening was performed. Verification of screening was then obtained from medical staff.

Statistical analyses

Data were analyzed using SPSS Version 14.0. Descriptive statistics were used to characterize the sample with respect to

demographic, psychosocial, and behavioral variables. Potential differences in baseline variables between the intervention and control conditions were examined using one-way analyses of variance (ANOVA) and chi-square analyses. Knowledge was comprised of the percentage of women who correctly endorsed each cervical-cancer risk factor or symptom, and chi-square analyses were used to assess potential differences in knowledge between the two groups. In addition, chi-square analyses were used to assess bivariate associations between sociodemographic variables and prior screening behavior. All sociodemographic and access variables that were associated with prior screening behavior were included as covariates in the subsequent multivariate analysis. Finally, a hierarchical logistic regression analysis was conducted to examine factors associated with 12-month posteducation screening behavior. In the regression analysis, relevant sociodemographic and access covariates were entered on step 1, followed by post-education health beliefs on step 2.

Results

Study sample

Table 1 presents baseline characteristics by study condition. All but one participant were foreign-born. Women in the control group were older, $F(1, 131) = 10.43, p < 0.01$. In addition, women in the control group were more likely to have health insurance (76.5%) compared to women in the intervention group (51.9%), $\chi^2(1) = 7.81, p < 0.01$, and were more likely to have a regular healthcare provider (78.8%) than women in the intervention group (55.1%), $\chi^2(1) = 7.68, p < 0.01$. No differences in education level, years living in the U.S., marital status, English-language fluency, or prior screening behavior were observed between the two groups.

To evaluate whether demographic variables were associated with prior screening behavior, bivariate comparisons were conducted. Marital status, education level, and having a regular healthcare provider were not significantly associated with prior screening behavior. One-way ANOVA indicated that women who had been screened previously were older

($M = 56.88$ years, $SD = 12.52$) compared to unscreened women ($M = 49.52$, $SD = 16.10$), $F(1, 128) = 7.23, p < 0.01$. Health insurance was associated with prior screening behavior, with a greater proportion of insured women (71.2%) having obtained a Pap test in the past 3 years compared to non-insured women (47.7%), $\chi^2(1) = 6.17, p < 0.05$. Finally, a greater proportion of women reporting English-language fluency (21.2%) had had a prior Pap test compared with women who reported that they did not speak English well or at all (13.9%), $\chi^2(3) = 7.17, p = 0.07$.

Knowledge

At baseline, no significant differences in knowledge about cervical-cancer risk factors and symptoms were observed between the intervention and control groups. And both intervention and control groups showed increases in knowledge about risk factors and symptoms following education. However, at postintervention, women in the intervention group were more likely to identify conditions such as HPV infection, multiple sexual partners, early age at intercourse, and giving birth to many children as risk factors for cervical cancer than did women in the control condition (see Table 2). Similarly, women in the intervention group were more likely to identify unusual vaginal discharge, pelvic pain, and pain during intercourse as possible symptoms of cervical cancer compared to women in the control group.

Post-intervention screening behavior

Cervical-cancer screening behaviors were assessed at 12 months postintervention. In the intervention group, 70% (56/80 women) had obtained screening, whereas 30% (24/80) had not been screened (see Table 3). In the control group, 11.1% (6/54 women) had obtained screening by 12 months postintervention. Screening rates were significantly higher in the intervention group (70%) compared to the control group (11.1%), $\chi^2(1) = 59.46, p < 0.001$.

In order to evaluate whether demographic factors, health-care access factors, or health beliefs were associated with

TABLE 1. DEMOGRAPHIC AND BASELINE PSYCHOSOCIAL CHARACTERISTICS OF STUDY PARTICIPANTS

Variables	Intervention (n = 80)	Control (n = 54)	p value
Mean age (SD)	51.35 (14.82)	59.35 (12.72)	<0.01
Marital status (married/living as married)	71.8%	71.7%	0.99
Education			0.22
<11 years	45.5%	31.8%	
12 years (high school)	28.6%	43.2%	
12+ years (college/post-grad)	26.0%	25.0%	
Years in U.S. (SD, range)	12.39 (10.74, 1–55)	14.88 (11.40, 1–46)	0.22
English-speaking proficiency			0.67
Not at all/not very well	79.7%	86.5%	
Fairly well	13.9%	9.6%	
Very well	6.3%	3.8%	
Have regular doctor			<0.01
Yes	55.1%	78.8%	
Have health insurance			<0.01
Yes	51.9%	76.5%	
Have ever had a Pap test			0.26
Yes	52.5%	48.1%	
No	47.5%	51.9%	

TABLE 2. PROPORTION OF WOMEN WHO IDENTIFIED CERVICAL-CANCER RISK FACTORS AND POTENTIAL SYMPTOMS AT PRE- AND POST-EDUCATION ASSESSMENTS

Variables	Intervention		Control		χ^2
	Pre-	Post-	Pre-	Post-	
Risk factors					
HPV infection	14.9% ^a	89.9% ^{a,c}	13.3% ^b	27.3% ^{b,c}	50.46 ^c
Giving birth to many children	6.8% ^a	84.8% ^{a,c}	11.1%	18.2% ^c	52.72 ^c
Having many sexual partners	23.0% ^a	84.8% ^{a,c}	31.3% ^b	63.6% ^{b,c}	7.21 ^c
Having sex at a young age	16.2% ^a	84.8% ^{a,c}	11.1% ^b	40.9% ^{b,c}	25.51 ^c
Smoking cigarettes	10.8% ^a	70.9% ^{a,c}	13.3% ^b	65.9% ^b	0.33
Possible symptoms					
Vaginal bleeding	29.5% ^a	93.4% ^a	42.6% ^b	84.8% ^b	2.41
Unusual vaginal discharge	20.5% ^a	93.4% ^{a,c}	36.2% ^b	65.2% ^{b,c}	15.99 ^c
Pelvic pain	6.4% ^a	88.2% ^{a,c}	17.0%	26.1% ^c	48.37 ^c
Pain during sexual intercourse	14.1% ^a	94.7% ^{a,c}	17.0% ^b	32.6% ^{b,c}	54.07 ^c

^aindicates significant difference between pre- and posteducation among the intervention group, all *p*'s < 0.001.

^bindicates significant difference between pre- and posteducation among the control group, all *p*'s < 0.05. No difference in pre-education knowledge was observed between the intervention and control group.

^cindicates significant difference between the intervention and control groups at posteducation, all *p*'s < 0.01. Corresponding χ^2 values are presented in the final column.

12-month, postintervention screening behavior, we conducted hierarchical logistic regression analyses with screening behavior as the dichotomous outcome variable. Variables identified as being associated with prior screening behavior (i.e., age, English-language fluency, health insurance) were entered on the first step. Health beliefs were entered on the second step. Results indicated that 12-month screening behavior was associated with older age (OR = 1.08, 95% CI = 1.01–1.15, *p* < .05), whereas women with poorer English-language fluency (OR = 0.30, 95% CI = 0.10–0.89, *p* < .05), and who did not have health insurance were less likely to obtain screening (OR = 0.15, 95% CI = 0.02–0.96, *p* < .05). Among health beliefs, only greater perceived severity of disease was positively associated with screening behavior (OR = 4.26, 95% CI = 1.01–18.04, *p* < .05).

Discussion

Our findings from this pilot study suggest that a cervical-cancer intervention that combines patient navigation services with cervical-cancer education and counseling is effective in increasing screening rates in this underserved and hard-to-reach population. Although patient navigation has been recognized as an instrumental component in facilitating access to appropriate healthcare and treatment, few programs have been developed for this population, particularly in the prevention setting. Yet, obtaining preventive care can be a for-

midable challenge for Chinese women who face not only psychosocial, but also access and language barriers, and therefore, adapting the navigator concept for cancer prevention is an extremely important element to incorporate into future programs designed for this community. Finally, it should be noted that identifying and helping women access programs that provide low-cost or free screening may be a key component of this program, given that nearly half of the women in the intervention group did not have health insurance.

The intervention program was effective at increasing knowledge of cervical-cancer risk factors and symptoms. This awareness may result in beneficial changes in screening behavior, since knowledge of cervical-cancer risk factors has been found to be associated with Pap test screening behavior in cross-sectional studies of Chinese women.¹³ Although knowledge of cervical-cancer risk factors did not predict posteducation screening behavior in the present study, the lack of an association may be due to several factors. First, any potential association that may exist between knowledge and behavior might be attenuated by the fact that access barriers were eliminated or greatly reduced in the intervention group, thereby making screening accessible for most, if not all, women. Second, in previous cross-sectional studies, it is unclear whether knowledge influences screening behavior or whether women who obtained screening gained knowledge from undergoing screening.

TABLE 3. SCREENING BEHAVIOR AT 12 MONTHS POSTEDUCATION

	Intervention	Control	χ^2
Percent who have ever had a Pap test (at baseline)	52.5% (42/80)	48.1% (26/52)	2.67, n.s.
Percent of screening rate among women who had not had a Pap test within 12 months prior to the intervention	70.0% (56/80)	11.1% (6/54)	59.46***

n.s., not statistically significant.

****p* < .001.

Our findings suggest that perceived severity was associated with subsequent screening behavior. This result is consistent with previous studies of Vietnamese women that reported increased perceived severity, but not perceived risk or benefits, was a significant predictor of obtaining a Pap test.³⁰ Similarly, a study of Cambodian women found that the perception that breast cancer is not serious was cited as a reason for not undergoing breast-cancer screening.³¹ A study of Chinese American immigrants found that younger age and higher knowledge about cervical cancer were associated with having had a Pap test within the previous 3 years, but none of the HBM constructs assessed (perceived cancer risk, perceived benefits, perceived barriers) was associated with screening.⁶ Age and English-language fluency were also significantly associated with screening behavior. Across a number of studies, English-language speaking ability has often been associated with cancer screening among Asian American women in general and Chinese American women specifically.^{6,12,31} Studies have demonstrated that women who are unable to speak or read English have many difficulties in accessing healthcare services, scheduling appointments, and communicating with healthcare professionals.³²

The results from this pilot study are highly promising, but we acknowledge several limitations of the study. First, although women in the two groups were similar on many demographic variables, they did differ on healthcare insurance and the presence of a regular healthcare provider. However, women in the control group were more likely to have health insurance and a healthcare provider, factors that have been positively associated with screening in previous studies.^{20,21} Given that the control group had a greater proportion of women with health insurance and a regular healthcare provider, these baseline differences may have actually attenuated the intervention effect somewhat. On the other hand, it has been suggested that having health insurance and a regular source of healthcare could have contributed to lower screening rates in the control group if insurance companies are unwilling to cover the costs of annual screening or if physicians are recommending longer screening intervals. Second, the 12-month followup may not have been a long-enough interval to capture screening among some women. Although none of the women in the present study had had screening in the past 12 months, it is possible that the 12-month followup period was not congruent for screening among a small subgroup of women. It is acknowledged that longer screening intervals (e.g., once every two to three years) may exist for a subset of women ages 30 and older, but this option is only appropriate for women who have had three consecutive negative results on annual tests.³³ In this sample of women, of which nearly 50% had never had a Pap test, it is highly unlikely that a substantial proportion of women would have received recommendations for the longer screening interval. Third, because the small sample size in this pilot study, analyses were performed at the individual (and not group) level, and therefore, our findings are preliminary in nature and remain to be evaluated in a larger study that involves a larger number of community sites. In addition, unequal sample sizes between the two groups lead to a reduced ability to detect potential differences that may exist. Fourth, because of differences in both the content of the education session, as well as the method of information delivery, it is unclear to which factors the increase in cervical-cancer knowledge can

be attributed. Some of the results could be due simply to exposure to different information. Finally, in this pilot study, we utilized brief measures in order to increase acceptability of the study in this community. Because of the brevity of the instrument, we were not able to fully evaluate components of the HBM and SCT. Future studies are needed to comprehensively investigate any associations between HBM constructs and cervical-cancer screening behavior.

In summation, these findings have implications for the development and implementation of future cervical-cancer prevention programs among Chinese American women. The present findings demonstrate that when specific elements addressing knowledge, psychosocial beliefs, and access barriers are presented together to target multiple, diverse factors within one cohesive curriculum, such an approach can contribute to significant improvements in screening rates. Community-accessible programs that draw upon a combination of health-promoting strategies can be highly effective in reducing the barriers that contribute to cancer health disparities and may be more likely to succeed in reducing cancer health risks among Chinese American women.

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Disclosure Statement

No competing financial interests exist.

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