
Assessing the Effectiveness of a Community-Based Media Campaign Targeting Physical Inactivity

The goal of this study was to develop, implement, and evaluate a community-based effort addressing the problem of physical inactivity. Using Prochaska's Transtheoretical Model as a guide, community members developed television and worksite media messages focusing on the benefits and barriers of physical activity and on increasing self-efficacy. The media campaign was effective in changing perceived barriers, perceived benefits, and self-efficacy surrounding physical activity and had an unexpected effect of changing behavior. It was reasoned that the success of the campaign might have been because of its unique local flavor. Seeing local community members participate in physical activity may motivate people to comply with the media messages. *Key words: media campaign, physical activity, sedentary lifestyle, stages of change model*

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ONE OF the most pervasive problems affecting society is the substantial proportion of Americans leading sedentary lifestyles. Recent statistics show that 20.2% of Americans have not participated in any leisure-time physical activity within the past month.¹ The finding that Arizonans ranked last in the nation in physical activity prompted the Arizona Department of Health Services to declare sedentary lifestyles an "epidemic."²

A sedentary lifestyle has been directly associated with many diseases and medical conditions including hypertension, heart disease, diabetes, colon cancer, excess weight, depression, anxiety, joint swelling and pain, lack of mobility, and stroke, as well as an overall shortened life span.³⁻⁸ The financial cost associated with treating these conditions is also significant in time lost from work because

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of illness, lower productivity, and general quality of life. In 1995, the direct cost surrounding the lack of leisure-time physical activity was estimated between \$24 and \$37 billion, or 2.4% and 3.7%, respectively, of U.S. health care expenditures.⁹

Health care practitioners have long advocated the incorporation of physical activity into one's lifestyle to improve overall health. The Centers for Disease Control and Prevention (CDC) have noted that the top three contributors to mortality—heart disease, cancer, and stroke—can be reduced through physical activity.^{10,11} Despite the health benefits, physical activity is simply not a regular part of the lifestyle of many Americans.

One barrier to affecting lifestyle change is the public's perception of physical activity as a structured regimen of vigorous activity that must be performed at least three or more times per week. This perception has been shaped by the National Institutes of Health Consensus Development Panel on Physical Activity and Cardiovascular Health and the Healthy People 2000 recommendations.^{12,13} Researchers now believe that people receive important health benefits from simple daily actions such as washing windows for 45–60 minutes, shooting basketball hoops for 30 minutes, walking for 30 minutes, or gardening for 30–45 minutes.¹⁴ Because of these findings, new recommendations emphasize that moderate-intensity physical activity should be included in one's day-to-day routine with an accumulation of 30 minutes of activity per day, most days of the week. For the sedentary public, the challenge is to change the perception of healthful activity from one of regi-

mented exercise to one of daily physical activities.

Many communities in the United States have been affected by the problem of physical inactivity. One example of this can be seen in Yuma, Arizona, a town with a population of 68,160.¹⁵ In a February 1997 community health assessment of Yuma, conducted by the Yuma Regional Medical Center, 29.6% of adults sampled reported no leisure-time physical activity. At that time, this percentage was higher than that of both Arizona and the nation.¹⁶ Several members of the Yuma community were alarmed by this statistic and wanted to take action to combat the problem of physical inactivity. This article reports the development, implementation, and evaluation of this community's effort to address the issue of physical inactivity.

METHODS

Subjects/community

Yuma County is located in the southwest corner of Arizona and has a population of 121,097.¹⁷ Yuma County is a rapidly growing area with 55% of its population under 35 years of age and an ethnic distribution that is predominantly Hispanic (48.5%) and white (46.8%).¹⁷

PROCEDURE

To gain an understanding of the problems leading to a sedentary lifestyle, the Yuma Regional Medical Center, the University of Arizona, and key community members collaborated to form a task force in July 1997 to develop an

intervention aimed at increasing physical activity among adult Yumans (defined as 30 to 64 years of age). The role of the University of Arizona was to help plan and evaluate this intervention.

The first step in developing the intervention was to convene a community forum in November 1997 to identify perceived barriers to physical activity and existing opportunities in the community for promotion of physical activity. The five barriers, ranked from highest to lowest, were: (1) lack of motivation, desire, commitment; (2) lack of time, too busy to be physically active; (3) lack of knowledge of the health benefits; (4) support and safety issues (i.e., good to have a buddy to keep you interested, need parental support); and (5) hot weather.¹⁸ These barriers are consistent with ones previously reported in physical activity literature.¹⁹⁻²³ The five main opportunities identified were: (1) the Yuma Parks and Recreation program, (2) public and private community facilities, (3) school and youth programs, (4) good weather, and (5) community events that promote physical activity. Notably, weather was identified as both a barrier and an opportunity. Yuma is in a region that boasts an average monthly temperature of 75.2°F.²⁴ However, high temperatures in Yuma average over 100 degrees during the summer, thereby earning the weather its categorization as both an opportunity and a barrier.²⁵

Working with information from the community forum and the new guidelines for physical activity,¹⁴ the task force began planning an intervention. To further facilitate the planning process, literature was gathered on similar programs that used a variety of behavior change theo-

ries. The purpose of examining the literature was to understand how best to develop a program that would change physical activity behavior. Theories commonly used in physical activity interventions were chosen for review. These included the transtheoretical, or stages of change, model; social cognitive theory; ecological models; and relapse prevention. The task force chose the stages of change model to guide its intervention because of its appropriateness for the subject matter and the ease with which it was understood.

Developed by Prochaska and DiClemente, the stages of change model consists of five stages of behavior change: precontemplation, contemplation, preparation, action, and maintenance.²⁶ People who can be categorized as being in the precontemplation stage have no intention of changing their current behavior within the next six months and often avoid considering their current behavior. People who are in the contemplation stage intend to change their behavior and are considering acting upon that intention within the next six months. People in the preparation stage have a more immediate goal of changing their behavior within the next 30 days and have made plans to change their behavior, such as joining a gym or purchasing a fitness magazine. People in the action stage are demonstrating behavior change, such as engaging in physical activity and modifying their lifestyle to allow for this physical activity, and have been doing so for less than six months. Maintenance refers to the stage in which people continue with the desired behavior, which has been occurring for more than six

months, and try to avoid relapsing to past behavior.²⁶

The task force envisioned a long-term strategy that would begin by targeting adults in the early stages of change and then, over time, gradually move to targeting adults in later stages of change. To determine a strategy to move people in these early stages of change to the next stage, the task force reviewed Prochaska's processes of change methods, which outlines 10 empirically supported approaches for moving people through the stages.²⁶ Three of these approaches—dramatic relief, environmental reevaluation, and consciousness raising—are intended for moving people from early stages of change to the next stage. Dramatic relief involves allowing people to experience the negative emotions associated with the unhealthy behavior.²⁶ Environmental reevaluation involves realizing the negative impact of one's unhealthy behavior on one's proximal social and physical environment.²⁶ Consciousness raising is a strategy to inform people of new facts, ideas, and tips that support the desired behavioral change. People become educated about their health behavior problem and the problem's consequences and cures, which is believed to help facilitate movement from an earlier to a later stage of change.²⁶ Task force members chose to focus on consciousness raising by

Consciousness raising is a strategy to inform people of new facts, ideas, and tips that support the desired behavioral change.

presenting information through a media campaign designed to deliver messages about physical activity. The task force opted in favor of a consciousness raising strategy for three reasons. First, task force members were well connected with local media and could thus leverage resources. Second, the task force thought that the other options required professional expertise that was unavailable or for which there were insufficient resources to contract. Third, the task force wanted to reach as many community members as possible in the shortest period of time and reasoned that the consciousness raising strategy was best suited to meet this goal.

IDENTIFYING CORE ELEMENTS FOR THE MEDIA MESSAGES

A subcommittee of the task force was formed to identify the core elements of the media messages. In keeping with the consciousness raising strategy, the subcommittee based the core elements of the messages on the benefits of physical activity, increasing self-efficacy, and addressing the barriers associated with physical activity.

Additionally, the messages were constructed so as not to discourage people who already participate in physical activity at levels above the recommended guidelines. Using these core elements as a guide, the subcommittee began drafting Public Service Announcement (PSA) scripts. The remaining members of the task force then reviewed the scripts, arriving at a consensus on those that best conveyed the message.

Methods used to deliver the media messages

The task force chose three methods to deliver the media messages: PSAs, comic strips, and worksite posters. Scripts were used to develop three 30-second television PSAs starring volunteers and task force members and featuring a mascot known as "The Y Guy." The main focus of the PSAs was on people participating in simple outdoor activities including walking, playing in a river, and washing a car, followed by the logo, "Think about it. It's your choice to be physically active." The scripts for these PSAs are available by request from the lead author. Focus groups consisting of members of the target audience (i.e., a convenience sample) were conducted to ensure that each PSA was being understood as intended. Focus group responses following the first PSA led to a change in the look and action of the mascot to be more fun and less threatening. Across all focus groups, respondents indicated that the message was to promote physical activity, exercise, or fitness. As a result of the focus group findings, the task force members felt confident that the message was being understood as intended.

Scripts were also used to guide the content of the comic strips. A local competition was conducted among high school art students to produce a comic strip that captured the essence of the physical activity message developed in the PSAs. In addition, the same logo used in the PSAs was included in each of the strips. Two comic strips were selected from 59 entries. Numerous worksites were contacted and asked to place the comic strip in their newsletters.

To select the worksite posters, the task force reviewed brochures from several distributors and agreed on two posters that were consistent with the elements of the core message identified earlier. The first poster was the Centers for Disease Control's "Physical Activity Is Everywhere You Go." The second featured a "couch potato" and the slogan "Eat A Potato, Don't Be One," which replaced the CDC poster after 10 months.²⁷

Delivering the media campaign

Before being released, each PSA was debuted on the early morning broadcast of a local television network. Different task force members were interviewed about the campaign, entitled "Yuma on the Move," followed by the airing of the PSA. Each PSA also aired on a second local network station and the cable network channels TNN, USA, and MTV. One consideration in using PSAs is the lack of control over when they air. Thus, tracking records were requested from each station that showed the number of times and when each PSA aired. Tracking records were obtained from local stations but, unfortunately, cable network channels were not able to provide tracking records.

The first comic strip was released in December 1998 in 17 worksite newsletters. The second comic strip was released in October 1999 and was published in 5 worksite newsletters by December 1, 1999. The circulation of the newsletters was tracked to estimate the potential number of people reached by the comic strips.

The first CDC poster was released in January 1999. One hundred and

thirty-five posters were displayed at 74 worksites and community buildings. The second was released in November 1999. Seventy-one posters were on display by December 1, 1999. Posters were placed in high-traffic areas, such as the Chamber of Commerce and utility companies, as well as in other areas where employees might congregate, such as teacher lounges. A sample of worksites was contacted by phone and asked to estimate the traffic in the areas where posters were displayed.

Assessing impact of the media campaign—telephone interview

The impact of the intervention was assessed using data collected from a telephone interview and a written survey. For the telephone interview, Professional Research Consultants conducted a random-digit dialing, resulting in data collection from 500 households in Yuma County. The telephone interview consisted of 111 questions, many of which were the same as those used in the Behavioral Risk Factor Surveillance Survey (BRFSS), a nationally conducted survey to measure behavioral risk factors. Use of these questions made it possible to compare local responses to state and national data. Of the BRFSS questions used, the following questions were of interest to the project's evaluation: (1) During the past month, did you participate in any physical activities or exercises, such as running, calisthenics, golf, gardening, or walking for exercise? (2) How many times per week or per month did you take part in this activity during the past month? And (3) when you took part in this activity, for how many

minutes or hours did you usually keep at it?

The telephone interview was repeated in the fall of 1999. A comparison of survey results would allow a determination of whether any self-reported change in levels of physical activity and sedentary status occurred. The telephone interview also assessed more distal outcomes such as cardiovascular disease and hypertension; however, two years was considered to be insufficient time to expect change in these variables. Therefore, the analysis was limited to assessing whether change occurred in levels of physical activity, which has been shown to affect the long-term outcomes of cardiovascular disease and hypertension.

Assessing impact of the media campaign—written survey

The second instrument used to assess impact was a written survey consisting of 11 questions. The first five questions gathered basic demographic data (i.e., date of birth, gender, occupation, permanent residence, and marital status). Respondents were asked about permanent resident status so that evaluators could omit responses from non-permanent residents since they were not targeted by the campaign. Question 6 was a stage measurement used by Marcus and Owen; Marcus, Rakowski, and Rossi; and Marcus, Eaton, Rossi, and Harlow.²⁸⁻³⁰ This question assessed level of activity on an 11-point scale, ranging from 0—“I currently do not exercise and I do not intend on starting for the next 6 months” (precontemplation)—to 10—“I currently exercise regularly and have

done so for six months" (maintenance). Marcus, Eaton, Rossi, and Harlow report the reliability of this measure to be 0.78.³¹ Respondents scoring 5 or greater (i.e., at least in the preparation stage of change) were asked to indicate the total number of minutes spent doing different kinds of activities each day (Question 7).

Question 8 was designed to assess knowledge of the benefits and barriers to physical activity and consisted of 10 true or false items from the National Institutes of Health.³² Question 9 was used to gather process data, asking respondents to indicate where, if at all, they obtained information about physical activity. Categories included radio, Internet, television, work, and newspapers/flyers. Question 10 was a five-item self-efficacy scale from Marcus, Selby, Niaura, and Rossi.³¹ The items asked respondents to rate their level of confidence to engage in physical activity in the presence of certain barriers (e.g., fatigue, lack of time, poor weather) on a 7-point scale ranging from not at all confident (1) to very confident (7). The internal consistency for this measure has been reported to be 0.82.³¹ The last question was a six-item decisional balance measure, consisting of three items assessing perceived benefits of physical activity (i.e., pro scale) and three items assessing the costs of exercising (i.e., con scale). The internal consistency for the pro items and con items is 0.70 and 0.56, respectively.²⁸

The written survey was administered to local schools, at businesses, and at the county fair prior to the media campaign and administered again in one year at the same locations. Schools and businesses were chosen because of the low turnover

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rate in this community. The fair was chosen because it was considered to be the most significant community event and is traditionally well attended. This strategy was employed in an effort to recapture some of the same people over time, allowing, perhaps, for a repeated measures or within-subjects analysis as opposed to being limited to a cross-sectional or between-subjects analysis.

RESULTS

The evaluation of the media campaign was conducted at both the process and impact levels. The *process evaluation* focused on assessing whether the media message was being properly delivered and understood. This included tracking the media messages to provide an estimate of how many people were being reached by the campaign and an analysis of how many people in the target audience saw the PSAs. The *impact evaluation* assessed more immediate changes in knowledge, beliefs, and attitudes about physical activity and lifestyle changes. This included an analysis of data collected using questions from the telephone interview and the written survey. An *outcome evaluation* assessing changes in morbidity and mortality was considered but not conducted. The study did not have the funding to track changes in these longer-term outcomes.

Telephone survey sample size and proposed analyses

The telephone interview collected data from 500 respondents in the fall of 1996 and 500 in the fall of 1999. Analyses for the telephone interview were conducted using all respondents (500 baseline and 500 follow-up), as the interview did not gather data on the respondents' stage of change. The telephone interview did not track whether the same individuals completed the telephone interview on both occasions. Therefore, only a between-subjects analysis was possible for these data.

Written survey sample size and proposed analyses

For the written survey, a total of 703 baseline surveys were collected from April through June 1998. From April to June 1999, 644 one-year follow-up surveys were collected at the same locations as the prior year and through the same task force member efforts. Analyses for assessing change were limited to the target population, namely those between 30 and 64 years of age who indicated they were in the first two stages of change. A total of 117 and 108 respondents satisfied these criteria in the baseline and follow-up years, respectively. It was predicted that some of the same individuals would complete both the baseline and follow-up survey. Identifying these respondents would be advantageous, as it would allow for a within-subjects, or more powerful repeated measures, analysis. Using date of birth, gender, and occupation as match-

ing variables, a search of the database identified 33 individuals who completed the written survey on both occasions. This sample of 33 formed the database for the within-subjects analysis. These 33 respondents were then removed from the original target population, leaving 84 and 75 different respondents who completed the survey in the baseline and follow-up years, respectively. This sample of 159 respondents formed the database for the between-subjects analysis.

Process evaluation

Television stations were contacted and asked for a log of when the television PSAs aired to determine whether the PSAs aired during hours when adults were likely to be watching, defined as being between the hours of 6:00 am and 10:30 pm.

The data in Table 1 provide some confidence that the PSAs aired at times when adults aged 30 to 64 are likely to be watching. Further evidence that the PSAs were reaching their intended target audience was forthcoming from the analysis of scores from the written survey. Results of a dependent *t*-test (within subjects analysis) indicated a significant increase in target audience respondents reporting that they had seen physical activity messages on television from baseline ($\bar{X}=3.61$) to follow-up ($\bar{X}=4.03$), $t(30)=2.437$, $p < .021$. Many of the respondents specifically cited the "Yuma on the Move" campaign as the message that they had heard. These results provide support for the effectiveness of television in delivering the message to the target audience.

Table 1. Air times for PSAs

PSA #	TV station	Times aired	Time period (1998–99)	# of times aired 6 am–10:30 pm
1	KSWT	38	August and September	30
2	KSWT	89	October to January	8
	KYMA	109		51
3	KSWT	44	March to May	29
	KYMA	79		30

A total of 8,488 and 1,770 copies of the first and second comic strips were released, respectively. Sixteen of the 74 locations displaying the poster were contacted and asked to estimate the traffic in those areas where posters were displayed. Across the locations contacted over a three-month period, approximately 78,600 people passed the posters. However, whether people viewed the poster and the number of times the same person may have passed a location where the poster was being displayed is uncertain. Between- and within-subjects analyses on scores from the written survey for work and newspapers/flyers were conducted. Analyses for both variables failed to reach statistical significance, suggesting that the comic strips and posters were not as effective as television in conveying the media message.

Impact evaluation—written survey

Between-subjects analysis

The 10 true or false items assessing physical activity were combined to form a single overall score for knowledge for each respondent. The maxi-

imum score possible was 10. The mean knowledge score at baseline and follow-up was $\bar{X}=8.62$ and $\bar{X}=8.79$, respectively. The difference was *not* statistically significant.

The three questions assessing the benefits of physical activity (i.e., be healthier, feel better about yourself, others respect me) were summed to form a pro scale. Similarly, the three questions assessing the costs of physical activity (i.e., being sore, less time for family, and wasting time) were summed to form a con scale. The maximum score for each scale was 15. No significant changes occurred in either the pro scale or con scale from baseline to follow-up.

The five dependent measures of self-efficacy (i.e., tired, bad mood, not enough time, on vacation, too hot or raining) were summed to form an overall self-efficacy score. Higher scores indicate greater self-efficacy for overcoming barriers to physical activity. The maximum scale score was 35. Self-efficacy rose significantly from baseline ($\bar{X}=13.12$) to follow-up ($\bar{X}=16.42$), $t(126)=2.71$, $p<.008$, suggesting that the target population felt more able to overcome the barriers to physical activity.

No significant change in level of activity was found. One explanation is that there was insufficient power to detect the small shifts in self-reported levels of physical activity.

Within-subjects analysis

Of the 33 subjects comprising the within-subjects analysis, three were in the precontemplative stage and 30 in the contemplative stage. For the most part, results paralleled those of the between-subjects analyses. Knowledge of physical activity was high but unchanged from baseline to follow-up ($\bar{X}=8.92$). There was no significant change in the perceived benefits of physical activity from baseline to follow-up or the perceived barriers of physical activity. However, self-efficacy improved significantly from baseline ($\bar{X}=11.86$) to follow-up ($\bar{X}=15.74$), $t(22)=3.12$, $p < .005$.

In contrast to the between-subjects analysis, the within-subjects analysis indicated that there were significant changes in level of physical activity from baseline ($\bar{X}=3.28$) to follow-up ($\bar{X}=4.34$), $t(31)=3.35$, $p < .002$.

Impact evaluation—telephone survey

Table 2 shows the percentage of the sample reporting that they did not participate in any leisure-time activity in 1997 (baseline) and 1999 (follow-up). While the percentage of respondents in the state who indicated that they did not engage in leisure-time activity rose dramatically, this trend was reversed in Yuma County.

Population segment comparisons were conducted for the “no leisure-time activ-

Table 2. Percentage of respondents in Arizona indicating they did not engage in leisure-time activity

	1997	1999
Yuma	29.8	25.6
Arizona	33.3	51.5

ity” and “sedentary” to more specifically assess the level of change in our target audience. Of the three telephone questions previously listed, the first question was used to formulate the measure of “no leisure-time activity” while the other two questions were used to measure sedentary status. The results of these analyses are shown in Table 3. The only statistically significant change among age categories was observed among the target audience, with self-reported no leisure-time activity decreasing from 35.6% to 23.1%. Although not statistically significant, a similar decrease was observed in the percentage of respondents who reported they were sedentary, declining from 57.8% in 1997 to 48.2% in 1999.

DISCUSSION

Evidence from this study suggests that the Yuma on the Move media campaign

The only statistically significant change among age categories was observed among the target audience, with self-reported no leisure-time activity decreasing from 35.6% to 23.1%.

Table 3. Population segment comparisons^a

Population segment	1997 sample size	1997 finding	1999 sample size	1999 finding	Statistical significance
No leisure-time activity					
Men	248	25.7%	249	23.8%	No
Women	252	33.7%	252	27.3%	No
18-39	229	26.2%	214	25.0%	No
40-64	170	35.6%	170	23.1%	Yes
65+	98	28.8%	114	30.3%	No
Sedentary					
Men	248	55.5%	249	54.3%	No
Women	252	59.6%	252	54.2%	No
18-39	229	60.6%	214	59.3%	No
40-64	170	57.8%	170	48.2%	No**
65+	98	50.8%	114	53.9%	No

**Note that although the percentage difference looks great, the comparative error for the 40-64 age segment is 10.6%.

^aAnalyses conducted by Professional Research Consultants, Omaha, Nebraska.
Statistically significant differences are represented in bold, $p < .05$

was successful in reaching the target audience, being understood, and effecting changes in the perceived self-efficacy to engage in physical activity. Subjects in the target population also reported that they felt more able to engage in physical activity despite barriers. This might be explained by the emphasis of all the PSAs on the ease of physical activity. Results indicate that television is the medium by which most people in the target population reported hearing about physical activity.

The campaign message also had a broader and unexpected impact. The original message focused on consciousness raising among precontemplative and contemplative persons. The purpose was to get people to "think about it." However, the telephone interview data sug-

gest that many people in our target age range are actually reporting more leisure-time physical activity. One limitation of the telephone interview data is that it only provides information on the age range of respondents and does not provide information on respondents' stage of change. Evidence, however, from the within-subjects analysis of the written survey suggests that the campaign did affect physical activity behavior of people in both the targeted age range and stages of change. The campaign may have had a broader impact beyond consciousness raising to impacting behavior change by increasing the level of physical activity among targeted Yuma residents. This contrasts with available evidence suggesting that consciousness raising is insufficient to produce behavior change. The

data suggest that the target population were knowledgeable about the benefits and myths of physical activity. The question then is what factors contributed to behavior change? One explanation for this “spillover” effect is the uniquely local flavor of the PSAs. Perhaps local viewers are more affected by media messages using area residents filmed in familiar locations that have meaning and applicability to their daily activities than by national programs with prescribed protocols and national spokespersons. This, however, would need to be explored by further research.

The lack of a control group limits the study’s ability to unequivocally attribute observed changes to the media campaign. Many threats to internal validity may exist. However, despite the absence of a control group, two findings strengthen the likelihood that the media campaign was responsible for the observed changes. First, the number of respondents reporting they were sedentary dropped in Yuma County while the remainder of Arizona reported a staggering increase in sedentary lifestyle during the same time period. Second, Yuma County is relatively small and the task

force was well connected to community groups and organizations. Inquiries made by our staff and task force members in the community yielded no evidence that other programs or initiatives targeted physical activity among our target population in the county. National campaigns aired on major and cable networks may have had some local impact; however, such an effect would also have affected all viewers across the state. These facts suggest that this local and cost-effective media campaign was effective in changing perceptions and behavior as they relate to physical activity.

In conclusion, the media-based campaign was successful in moving people along the continuum of physical activity. Although not directly tested here, something akin to the subjective norm component of the theory of reasoned action may explain why this local campaign was successful.^{33,34} That is, seeing others in the community participating in physical activity may motivate people to comply with the media messages. The findings reported here are encouraging, especially as the epidemic of sedentary lifestyle continues to spread.

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