Between-Session Practice and Therapeutic Alliance as Predictors of Mindfulness After Mindfulness-Based Relapse Prevention

Sarah Bowen and Andrew S. Kurz

University of Washington

Objectives: Mindfulness-based treatments have demonstrated efficacy in reducing symptoms in clinical populations. Not surprisingly, research suggests increases in client mindfulness might be a mechanism of change in these treatments. However, little is known about specific factors that lead to increased mindfulness. Design: The present study is a secondary analysis of 93 adults in outpatient treatment for substance abuse, assessing effects of between-session mindfulness practice and therapeutic alliance on levels of mindfulness after an 8-week Mindfulness-Based Relapse Prevention (MBRP) program. Results: Between-session practice over the course of the 8 weeks was predictive of mindfulness at postcourse, although not at the 2-month or 4-month follow-up assessments. Client-rated therapeutic alliance was a significant predictor at the 2-month follow-up, although not at 4 months. Conclusions: These findings suggest that between-session practice and therapeutic alliance might be important factors in the initial increases in mindfulness after mindfulness-based treatments, but factors supporting longer term mindfulness might shift over time. © 2011 Wiley Periodicals, Inc. J. Clin. Psychol. 68:236–245, 2012.

Keywords: Mindfulness, homework, home practice, therapeutic alliance, substance abuse

The prescientific Buddhist roots of mindfulness practice date back thousands of years. However, the construct and practices of mindfulness are still relatively new to Western psychology and may require additional discussion and study before consensus is reached on definition, practice and measurement (Brown, Ryan, & Creswell, 2007). Mindfulness is often defined in the psychological literature as "awareness that emerges through paying attention, on purpose, in the present moment, and non-judgmentally to the unfolding of experience moment by moment" (Kabat-Zinn, 2003, p. 145). Mindfulness has also been described as a state of consciousness and enhanced present-centered awareness (Brown & Ryan, 2003), a two-component metacognitive skill and practice of awareness and nonjudgment (Bishop et al., 2004), and as a multicomponent cyclical process of intention, attention, and attitude (Shapiro, Carlson, Astin, & Freedman, 2006).

Mindfulness has received increasing attention in the empirical literature over the past decade, resulting in several new mindfulness-based treatments and efficacy studies for various medical and psychological disorders. Perhaps the most widely known and studied of these treatments are Mindfulness-Based Stress Reduction (MBSR; Kabat-Zinn, 1990), originally developed for individuals with chronic pain, and Mindfulness-Based Cognitive Therapy (MBCT; Segal, Williams, & Teasdale, 2002) for prevention of relapse to depression. Meta-analyses have shown evidence for MBSR's efficacy for improving coping in both clinical and nonclinical populations (Grossman, Niemann, Schmidt, & Walach, 2004), and for treating symptoms of anxiety and depression in clinical populations (Hoffman, Sawyer, Witt, & Oh, 2010). Studies of MBCT have offered evidence for its efficacy in decreasing risk of relapse for individuals with three or more previous major depressive episodes (Ma & Teasdale,

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Correspondence concerning this article should be addressed to: Sarah Bowen, University of Washington, Department of Psychology, Box 351629, Seattle, WA 98195-1525; e-mail: swbowen@uw.edu

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2004; Teasdale et al., 2000), generalized anxiety disorder and panic disorder (Evans et al., 2008; Kim et al., 2009), mixed mood disorders (Ree & Craigie, 2007), and current treatment-resistant depression (Kenny & Williams, 2007).

Based on the content and structure of MBSR (Kabat-Zinn, 1990) and MBCT (Segal et al., 2002), Mindfulness-Based Relapse Prevention (MBRP; Bowen, Chawla & Marlatt, 2010) was developed for treatment of addictive behaviors, integrating standard cognitive behavioral relapse prevention treatment (Marlatt & Gordon, 1985) with mindfulness meditation exercises and skills. In an initial efficacy trial, (Bowen et al., 2009), participants in MBRP, as compared to those in a treatment-as-usual control group, reported, lower rates of substance use, greater decreases in craving, and greater increases in acceptance and mindful awareness. Other studies have similarly examined mindfulness-based treatments for addictive behaviors with encouraging results (e.g., Brewer et al., 2009; Vieten, Astin, Buscemi, & Galloway, 2010; Zgierska et al., 2009).

Historically, mindfulness research has centered on the effectiveness of mindfulness and mindfulness-based interventions (Shapiro et al., 2006). More recently, however, studies have assessed mechanisms by which mindfulness-based interventions improve outcomes (Keng, Moski, & Robins, 2011). It might be expected that such interventions would lead to an increase in levels of mindfulness, and this increase would in turn lead to improved treatment outcomes. Several studies have indeed reported changes in levels of self-report mindfulness after mindfulness-based treatment (e.g., Bränström, Kvillemo, Brandberg, & Moskowitz, 2010; Brewer et al., 2009; Carmody & Baer, 2008; Carmody, Baer, Lykins, & Olendzki, 2009; Dobkin, 2008; Krasner et al., 2009; Raes, Dewulf, Van Heeringen, & Williams, 2009; Ree & Craigie, 2007; Shapiro, Oman, Thoresen, Plante, & Flinders, 2008), and studies have also demonstrated that increases in mindfulness mediate treatment outcomes. For example, studies suggest a meditating role of mindfulness in the relation between mindfulness-based treatment and rumination (Shapiro et al., 2008), cognitive reactivity (Raes et al., 2009), depressive symptoms (Kuyken et al., 2010; Shaher Britton, Sbarra, Figueredo, & Bootzin, 2010), quality of life (Nyklíček & Kuipers, 2008), psychological symptoms (Carmody et al., 2009), and well-being (Carmody & Baer). Although the study of the role of mindfulness in improving clinical outcomes is young, it appears to hold promise for several commonly targeted psychological symptoms.

Based upon emerging evidence of its importance, newer studies are beginning to assess what factors might lead to increases in mindfulness. It has been suggested by the developers of mindfulness-based therapies (e.g., Kabat-Zinn, 2003; Segal et al., 2002) that it is essential for clients to engage in regular ''formal'' mindfulness practices (e.g., sitting meditation) between sessions. Mindfulness-based treatments introduce and provide instruction for these practices, in efforts to support the development of sustained mindfulness practice in daily life (e.g., Kabat-Zinn, 1990; Segal et al.). There has been surprisingly little research on between-session practice and increases in levels of mindfulness, however. A recent meta-analysis by Vettese, Toneatto, Stea, Nguyen, and Wang (2009) found that out of 15 studies of mindfulness-based interventions implementing validated measures of mindfulness, only three reported on the relation between hours practiced and mindfulness (Carmody & Baer, 2008; Carmody, Reed, Kristeller, & Merriam, 2008; Schenström, Rönnberg, & Bodlund, 2006). Two of those three (Carmody & Baer; Schenström et al.) showed a significant positive correlation between mindfulness and hours of meditation practice.

Carmody and Baer (2008) followed 174 adults with a range of medical and psychiatric symptoms following a clinical 8-week MBSR program. Mindfulness was measured with the Five Facet Mindfulness Questionnaire (FFMQ) and participants logged the number of minutes they engaged in formal and informal (mindfulness during everyday activities) mindfulness practice between sessions. On average, participants performed 31–35 minutes of formal mindfulness practice (e.g., body scan, mindful yoga, sitting meditation) per day and performed a formal practice on 34 of the 42 assigned days (80% compliance). Participant mindfulness significantly increased from pre-MBSR to post-MBSR, with moderate effect sizes. Time spent in formal practice was a significant predictor of increases in mindfulness, although informal practice was not. The study also found that increases in client mindfulness mediated

the relation between meditation practice over the course of the treatment and improvement in main outcome variables, such as various psychological symptoms and stress.

Carmody, Reed, Kristellar, and Merriam (2008) followed 44 adults, referred by their primary care doctors for various (unmeasured) symptoms, who participated in an 8-week MBSR program. State mindfulness was measured using the Toronto Mindfulness Scale (Lau et al., 2006) and trait mindfulness with the Mindful Attention Awareness Scale (Brown & Ryan, 2003). Participants logged time spent in home mindfulness practice by using tracking worksheets. The mean number of minutes of formal practice was 31 minutes per day. Contrary to the Carmody and Baer (2008) study, no significant association was found between at-home practice and state or trait mindfulness.

In a study by Schenström and colleagues (2006), 52 caregivers in a primary care setting participated in a mindfulness-based cognitive attitude training, based on MBSR and designed to reduce the negative effects of stress on healthcare personnel. Mindfulness was measured with the Mindfulness Attention Awareness Scale (Brown & Ryan, 2003) and at-home practice was recorded in a simple numeric multiple-choice questionnaire. Results showed that participants who engaged in more at-home practice had significant increases in mindfulness, while participants who engaged in little or no at-home practice did not. Other than one study of effects of positive reappraisal on mindfulness (Garland, Gaylord, & Fredrickson, 2011), we were unable to locate any published research on factors other than formal practice that predicted increases in client mindfulness following mindfulness-based treatment.

Another hypothesized predictor of increases in mindfulness is the relationship between the therapist and client. Therapeutic alliance (also called working alliance) has been described as (a) agreement between client and therapist on goals, (b) agreement on tasks used to achieve those goals, and (c) the interpersonal bond between the client and therapist (Bordin, 1979; Tracey & Kokotovic, 1989). Meta-analytic studies reviewing literature on the role of therapeutic alliance in psychological treatments (Horvath & Symonds, 1991; Martin, Garske, & Davis, 2000) suggest it is predictive of treatment outcomes in various areas of psychotherapy (Horvath & Luborsky, 1993), behavior therapy (Sweet, 1984), cognitive therapy (Waddington, 2002), and substance misuse (Meier, Barrowclough, & Donmall, 2005). The potential role of therapeutic alliance in increasing mindfulness after MBRP may be due to the influence of the above factors. In MBRP, it is suggested by the therapist that mindfulness practice will help maintain treatment goals. Agreement upon treatment goals may be necessary for the client to adopt the treatment rationale (Bordin). Similarly, agreement on tasks necessary to achieve these goals might be of particular importance (Horvath & Luborsky, 1993). For example, MBRP clients are asked to bring purposeful attention to routine daily activities that are often done "mindlessly" as a way of increasing overall awareness of internal and external triggers and habitual reactions. This requires agreement on necessary tasks and commitment to engage in these "informal" mindfulness practices throughout the day. Finally, Siegel (2007) suggests that "secure interpersonal attunements [between therapist and client] likely create states of integration that promote internal attunement and mindfulness as a trait" (p. 317). Similarly, Bruce, Shapiro, Constantino, and Manber (2010) propose that the mindful psychotherapist's "ability to form an attuned, empathic relationship with the patient can lead to improvement in the patient's ability to self-attune" (p. 83). The therapeutic bond between client and therapist might therefore support a client's willingness to attune to and mindfully explore his or her own experiences.

Although several studies report the therapeutic effects of the client-therapist relationship on substance abuse treatment retention and outcomes (e.g., Gilbert, 2011; Gibbons et al., 2010; Myers, Pasche, & Adam, 2010), few studies have assessed the relation between therapeutic alliance and mindfulness. In fact, only two locatable studies reported effects of therapists' levels of mindfulness on the therapeutic relationship (Padilla, 2011; Wexler, 2006). No locatable studies were found, however, on effects of the strength of alliance on effects of fostering mindfulness in clients.

Thus, the current study assessed changes in levels of mindfulness following an MBRP intervention, examining the effect of two factors on increases in mindfulness in a sample of individuals with substance use disorders. Hypothesized predictors were time spent between sessions engaged in mindfulness meditation practices and client ratings of therapeutic alliance.

Specifically, it was expected that postcourse reports of duration and frequency of mindfulness practice would be positively associated with levels of mindfulness, as measured by the FFMQ, at 2-month and 4-month follow-up points. Similarly, postcourse ratings of therapeutic alliance, as measured by the Working Alliance Inventory, would be positively related to mindfulness at the follow-up points.

METHOD

Procedure

The current study is a secondary analysis of data from a feasibility and efficacy trial of MBRP. The parent study from which the current data are drawn evaluated effects of an 8-week MBRP course as compared with treatment as usual (TAU) in an outpatient sample of 168 adults with substance use disorders (Bowen et al., 2009). All participants were between 18 and 70 years of age, and had recently completed either inpatient or intensive outpatient treatment. The primary substance of choice was alcohol (45.2%), followed by cocaine/crack (36.2%), methamphetamines (13.7%), opiates/heroin (7.1%), marijuana (5.4%), and other substances (1.9%). Approximately 19.1% of the sample reported polysubstance use. Participants reported that for the 60 days before entering initial treatment they were using substances on an average of 27.29 (standard deviation [SD] = 24.28) days. MBRP groups, ranging from 6–10 participants, met for 2 hours each week, with two therapists delivering each session. Participants in MBRP were assigned between-session practices each week, which included audio-recorded instructions for mindfulness exercises, worksheets identifying triggers and reactions, and other exercises designed to raise awareness of problematic reactive behaviors. Treatment provided in the TAU groups was based primarily on the 12-step philosophy, and included psychoeducational components and relapse prevention skills.

Therapist fidelity to the MBRP protocol was assessed using audio recordings of a randomly selected 50% of the 8-week groups, rated by independent coders. Coders used the MBRP Adherence Competence Scale (MBRP-AC; Chawla et al., 2010), designed to measure therapist adherence to individual components of MBRP, discussion of key concepts, and therapist style and performance. Findings showed high interrater reliability for all treatment adherence and competence subscales, and suggested relatively high levels of adherence (90%) for an initial feasibility and efficacy trial (Chawla et al.).

Assessments for all participants were administered at baseline, immediately after completion of the course, and 2 and 4 months after the end of the intervention period. Assessments included self-report measures of craving, affect, mindfulness, acceptance, therapeutic alliance, meditation practice, and substance use. Retention rates at postcourse, 2-month, and 4-month assessment points were 61%, 57%, and 73%, respectively. Results suggested that when compared with those in TAU, participants in MBRP reported fewer days of alcohol or other drug use over the 4-month follow-up period. Craving was also found to be significantly lower for MBRP participants than for those in TAU, and decreases in craving partially mediated the substance use outcomes. (See Bowen et al., 2009, for full report.)

Sample

The current study was designed to examine factors contributing to levels of client mindfulness after mindfulness-based therapy. Thus, analyses include only those participants randomized to MBRP ($n = 93$). Specifically, we assessed changes in mindfulness after the intervention and the relation between time spent on between-session mindfulness practices and effects of client-rated therapeutic alliance on levels of mindfulness at postcourse, and 2-month, and 4-month follow-up time points.

Approximately 36% of participants in the MBRP condition were female. The majority of MBRP participants identified as Caucasian (63%), followed by African American (23%), American Indian or Alaska Native (10%), Hispanic or Latino/a (6%), Native Hawaiian or

other Pacific Islander (3%), Asian (1%), or other (1%). The mean age was 40.84 years (SD = 10.23). (See Table 1 for further demographic information.)

Measures

All measures were self-report. Demographics were assessed at baseline, therapeutic alliance was assessed at postcourse, between-session practice was assessed mid-course (4 weeks into the intervention) and at postcourse, and mindfulness and substance use were measured at the baseline, postcourse, and 2-month and 4-month follow-up assessment points.

Demographic questions included age, ethnicity, and socioeconomic status.

Therapeutic alliance was measured using the 12-item client version of the Working Alliance Inventory, Short Form (WAI-S; Tracey & Kokotovic, 1989), a 12-item self-report measure based on the WAI (Horvath & Greenberg, 1989). The WAI-S has demonstrated high internal consistency (Busseri & Tyler, 2003). Cronbach's alpha in the current study was .92.

Mindfulness was assessed with the FFMQ (Baer, Smith, Hopkins, Krietemeyer, & Toney, 2006), which is comprised of 39 items rated on a 5-point Likert scale. The FFMQ has demonstrated good internal consistency (Baer et al.), with a Cronbach's alpha of .91 in the current study. The FFMQ sum score is often used in studies of mindfulness-based treatments

Table 1
Demographic Information for MBRP participants

Variable	MBRP (n = 93)
Age	Mean (*SD*)
	40.84 (10.23)
Ethnicity	Percent (n)
Caucasian	63 (59)
African American	23 (21)
American Indian or Alaskan Native	10 (9)
Hispanic or Latino/a	6 (6)
Native Hawaiian or other Pacific Islander	3 (3)
Asian	1 (1)
Other	1 (1)
Gender	Percent (n)
Male	65 (60)
Female	36 (33)
Annual income	Percent (n)
0-$4999	60 (55)
$5000-$9999	7 (6)
$10,000-$14,999	7 (6)
$15,000-$19,999	2 (2)
$20,000-$34,999	8 (7)
$35,000-$49,999	5 (5)
$50,000 or higher	0 (0)
Unknown	12 (11)
Highest education level	Percent (n)
Middle school	8 (7)
G.E.D.	17 (16)
High school	15 (14)
Some college	26 (24)
Community college	15 (14)
Bachelor's degree	9 (8)

Note: MBRP = Mindfulness-Based Relapse Prevention; SD = standard deviation.

(Bränström et al., 2010; Garland, Gaylord, Boettiger, & Howard, 2010; Sanders & Lam, 2010). The sum score is similarly used in the current study to assess participants' level of general mindfulness.

Meditation practice was assessed halfway through the course (4 weeks) and at the end of the course. Participants were asked the average length (minutes) and frequency (times per week) of meditation practice. A sum score of total minutes of practice per week was calculated.

Paired sample t test was used to assess baseline to postcourse changes in levels of mindfulness, and multiple regression analyses were used to assess effects of between-session practice and therapeutic alliance, measured at postcourse, on postcourse and follow-up levels of mindfulness.

RESULTS

Scores on the primary outcome variable, FFMQ, were assessed for univariate outliers and deviation from expected distributions. FFMQ scores were continuous and normally distributed, and no outliers were revealed.

Paired sample t test revealed a significant increase in levels of mindfulness between baseline and postcourse, $t(33) = -2.43$, $p = .021$, which remained significant through 4-month follow-up, $t(33) = -2.57$, $p = .014$ (see Table 2).

Multiple regression analyses assessed effects of the hypothesized predictors of between-session practice and therapeutic alliance on postcourse and follow-up levels of mindfulness, covarying baseline FFMQ scores. Results revealed a significant relation between time spent in between-session practice over the course of the 8-week intervention and mindfulness at postcourse, $\beta = .338$, $t(30) = 2.23$, $p = .033$. However, there was not a significant relation between time spent in between-session practice and mindfulness at either 2-month follow-up, $\beta = .327$, $t(26) = 1.94$, $p = .065$, or 4-month follow-up, $\beta = .233$, $t(28) = 1.43$, $p = .164$.

WAI scores were significantly related to postcourse FFMQ scores, $\beta = .479$, $t(31) = 3.51$, $p = .001$, maintaining significance when between-session practice was included as a covariate, $\beta = .414$, $t(29) = 2.78$, $p = .009$, with higher scores on the WAI related to higher levels of mindfulness (see Table 2 for means). WAI remained a significant predictor of FFMQ scores at the 2-month follow-up, $\beta = .439$, $t(23) = 2.65$, $p = .014$. However, WAI scores did not predict FFMQ scores at the 4-month follow-up, $\beta = .224$, $t(26) = 1.379$ $p = .180$.

DISCUSSION

Results of the current study revealed significant increases in mindfulness for MBRP participants over the course of the study, which were maintained through the 2- and 4-month follow-up assessments. The amount of time spent practicing between sessions over the 8 weeks of the course was significantly related to levels of mindfulness at postcourse. Contrary to hypotheses, however, between-session practice was not predictive of levels of mindfulness at the 2-month or 4-month follow-up assessments. These results suggest that engagement in between-session practice is related to levels of mindfulness immediately after the course; however, they were not predictive of longer-term levels of mindfulness.

Results from similar studies are mixed. Schenström et al. (2006) similarly found that participants who regularly engaged in between-session mindfulness practice had significant

Table 2
Means (SDs) of WAI and FFMQ Across Assessment Points Among MBRP Participants

Variable	Pre	Post	2-Mo	4-Mo
WAI	------	5.0 (1.3)	------	------
FFMQ	98.2 (14.9)	105.8 (15.9)	103.7 (16.4)	104.6 (14.8)

Note: SD = standard deviation; WAI = Working Alliance Inventory; FFMQ = Five Factor Mindfulness Questionnaire; MBRP = Mindfulness-Based Relapse Prevention.

increases in mindfulness following the course, maintained throughout the 3-month follow-up period. Carmody and Baer (2008) also found that formal practice significantly predicted increases in mindfulness at postcourse, but did not include follow-up assessments. In contrast, Carmody et al. (2008) found no relation between between-session practice and mindfulness at postcourse.

The current study assessed ''formal'' practice, such as sitting meditation, but did not include assessment of ''informal'' practices or use of mindfulness in daily life or high-risk or stressful situations. Although mindfulness-based interventions emphasize the importance of formal practice, such practices are theoretically carried forth in a client's daily life (e.g., recognizing an urge to behave reactively and intentionally pausing before choosing a skillful response). Such integrated practices might lead to increases in mindfulness. The MBSR course in the Schenström et al. (2006) study included both formal and informal practices, but it is unclear whether measurement of between-session practice included informal practices. Carmody and Baer (2008) did not find informal practice to significantly predict mindfulness. However, such practices vary from treatment to treatment and thus should be measured and assessed. For example, MBRP contains ''informal'' practices such as ''urge surfing'' and ''mini-mediations'' for use in high-risk situations or in the event of cravings or urges to use substances. These practices might differ from the ''mindfulness in everyday life'' described in the Carmody and Baer MBSR study, and thus might have different effects on levels of mindfulness. Additionally, the population in the current study was different from the other studies (i.e., individuals with substance abuse disorders), and thus informal mindfulness practices might have different effects.

Finally, we hypothesized a positive relation between client-rated therapeutic alliance at postcourse and follow-up levels of mindfulness, which was partially supported by the current study. Postcourse client-rated measure of alliance was significantly related to postcourse levels of mindfulness, with stronger alliance related to higher scores on overall mindfulness, even after accounting for effects of between-session practice. Strength of alliance remained predictive of mindfulness at the 2-month follow-up assessment, but not at the 4-month follow-up. These results suggest an effect of quality of alliance in mindfulness-based therapy on development and short-term maintenance of client mindfulness, over and above effects of between-session formal mindfulness practices.

In the context of mindfulness-based therapy, agreement upon therapy tasks and goals, i.e., committing to practice ''informal'' mindful engagement in one's day-to-day life and a therapeutic bond supporting mindful exploration of experience, might be necessary factors for increasing mindfulness.

Although significant effects of the hypothesized predictors of between-session practice and therapeutic alliance were found for postcourse and 2-month follow-up assessments, respectively, time spent on between-session practice was no longer predictive after postcourse, and alliance was no longer predictive after the 2-month assessment. There are several possible explanations for these findings. As mentioned above, the strength of these relations might decrease over time. Initially, the between-session practice and therapeutic alliance may lead to increases in clients' levels of mindfulness in the earlier stages of practice, but over time, other maintaining factors might become more predictive, such as continued formal or informal mindfulness practice, levels of mindfulness of peers, family members or sponsors, or level of support in one's social network for continuing mindful engagement in daily life. Future studies would benefit from investigating whether factors that sustain levels of mindfulness shift over time, with immediate effects of between-session practice and therapeutic alliance giving way to other maintaining influences.

The current study has several strengths. In support of literature showing benefits of increased mindfulness, results offer further insight into factors that might foster these increases in a clinical population. Moreover, the study highlights the need for exploration of additional predictors of mindfulness and assessment of how these predictive factors might shift over time. Additionally, the sample was drawn from a racially and socioeconomically diverse and understudied population. Alongside its strengths, the study has limitations to consider. Data were collected via participant self-report, and between-session practice was measured

retrospectively at 4 weeks and at postcourse assessment, using a nonvalidated measure; future studies might benefit by assessing therapist ratings of alliance in addition to those reported by clients and assessing between-session practice weekly throughout the duration of the course. Attrition rates in the parent study present another limitation. Although commensurate with studies of similar populations (Farrington, Petrosino, & Welsh, 2001), the lack of complete data for follow-up assessments limits the conclusions that can be drawn.

CONCLUSIONS

Although both treatment developers and data from a handful of studies suggest formal mindfulness practice is the primary way in which clients increase mindfulness, the current study suggests there might be other important factors to consider as well, such as clients' experiences of the therapeutic relationship. Future studies might offer further insight into how both mindfulness practice and therapeutic alliance are affecting changes in mindfulness and explore other factors influencing increases in and longer term maintenance of mindfulness in mindfulness-based therapies.

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