

Brief take-home laughter yoga practice (B-TLYP): impact on multi-dimensional affects among Chinese adults in Hong Kong

Abstract

Objective: To examine the effect of a brief take-home laughter yoga practice (B-TLYP) intervention on multidimensional affects among Hong Kong adults.

Method: The intervention consisted of a one-hour workshop and a take-home guide on laughter yoga exercises.

Thirty-six adults (mean age: 48.3 years) joined the interventions and completed questionnaires on demographics and affects. Positive affect (PA) and negative affect (NA) were measured by the Positive and Negative Affect Schedule (PANAS) at baseline, immediately and one week after the intervention. Repeated measure ANOVA was used to examine differences in PANAS scores across time.

Results: The mean score of PANAS PA subscale showed an increasing trend across time, whereas there was no difference in the mean score of PANAS NA subscale.

Discussion: This study provides preliminary support for the benefits of B-TLYP on adult positive affect.

Keywords: laughter exercise, laughter yoga, positive affect, negative affect, wellbeing

Introduction

Affects are emotional states that have influences on daily life functions. Proper management of these emotional states is essential for wellbeing (Thompson, 1991). Research yields two dimensions of affect, namely positive affect (PA) and negative affect (NA). PA generally reflects positive mood states (e.g. joy and enthusiastic), whereas NA reflects subjective distress and dissatisfactions (e.g. fear and sadness) (Watson, Clark, & Tellegen, 1988). While PA facilitates positive life experiences and broadens cognitive states (Fredrickson and Branigan, 2005), NA causes poor coping and health problems (Cooper, Frone, Russell, & Mudar, 1995). Maladaptive emotion regulation strategies can increase NA (Compas et al., 2017), and NA has been found to be predictive of mental disorders such as major depression (Watson, Clark, & Stasik, 2011) and increase suicidal risk (Dumais et al., 2005). Suicide rates are increasing especially in Asian populations such as Japan and Hong Kong, further highlighting the urgent need of effective strategies to reduce these serious mental health problems worldwide (Snowdon et al., 2017).

More evidence shows that therapeutic interventions can be more effective than pharmacological treatment in making long-term health improvement (Hofmann, Asnaani, Vonk, Sawyer, & Fang, 2012). These therapeutic interventions usually target diagnosed patients and involve administration of complex behavioral and cognitive techniques by a licensed therapist (Andersson, 2010). Such therapeutic interventions may not be applicable to people with borderline mental health disorders (i.e. their levels of NA below the clinical threshold for mental disorders). Without remediation, even low and moderate levels of NA can continue and develop to a full-blown disease over time. Therefore, early prevention of mental disorders prior to symptom onset is essential.

Working people and disadvantaged people are particularly at risk of mental disorders because they face more stressors such as work stress and financial stress. The lack of time and money for recreational activities may also increase NA in these individuals. Such concerns have prompted researchers to look for time- and money-saving ways to help these at-risk individuals to manage their NA. One intervention method is through laughter yoga, which was developed by an Indian physician, Madan Katrina, in 1995. This method uses a combination of unconditional laughter with yoga breathing exercise to induce physical and mental health benefits (Yazdani, Esmaeilzadeh, Pahlavanzadeh, & Khaledi, 2014). Laughter provides a useful, cost-effective, and easily accessible means for stress reduction, and it has been proven to have various beneficial effects on different body systems among elderly, transplant patients, smokers, cancer patients, etc. (M. P. Bennett, Zeller, Rosenberg, & McCann, 2003; P. N. Bennett et al., 2015; Shahidi et al., 2011). In addition, even laughing without reason was found to be helpful for reducing

stress, as laughter could keep one in positive mind (Lee and Kleiner, 2005). On the other hand, yoga breathing has been shown effective in relieving NA (Brown and Gerbarg, 2009).

There is an increasing body of literature on the benefits of laughter yoga. The benefits include strengthening the immune system by reducing cortisol level and increasing secretory immunoglobulin A and T-cells (Ryu, Shin, & Yang, 2015). It also relieves insomnia and pain due to the secretion of endorphins during laughing (Dumbre, 2012). Endorphin is endogenous opioid peptides produced in the central nervous system. A direct relationship between endorphin uptakes at receptor sites and perceived affect has been demonstrated in previous neuroimaging studies (Dunbar et al., 2011). In addition, laughter benefits the pulmonary and cardiovascular system (Lebowitz, Suh, Diaz, & Emery, 2011) through decreased heart rate and blood pressure, whereas the deep breaths involved in yoga increase oxygen intake in tissues (Ghodsbin, Ahmadi, Jahanbin, & Sharif, 2015). The muscular activities of face, larynx and trunk caused by laughter contribute to improvement in respiration and spine stabilization (Wagner, Rehmes, Kohle, & Puta, 2014). Moreover, laughter could reduce symptoms of depression, anxiety, stress, and tension (Chang, Tsai, & Hsieh, 2013) by blocking stress-related hormones such as cortisol, epinephrine and dihydroxyphenylacetic acid (Basmajian, 1998; Berk, Tan, & Berk, 2008). It can also distract one from negative thoughts and enhance the feeling of security and positive energy (Yazdani, et al., 2014), leading to better psychological health and quality of life (Edwards and Cooper, 1988).

There has been evidence on the positive outcomes of structured programs on laughter yoga (P. N. Bennett, et al., 2015; Shahidi, et al., 2011; M. K. Weinberg, T. G. Hammond, & R. A. Cummins, 2014; Yazdani, et al., 2014). However, structured programs consist of several sessions in fixed time and place which can be difficult for busy people to join. There is a need to examine the effect of a brief intervention with take-home assignment that teaches laughter yoga exercises for the general population. Furthermore, very few studies used affect as outcome variable. Hence, this study examined the effect of a brief take-home laughter yoga practice (B-TLYP) intervention on multidimensional affects among Hong Kong adults. We hypothesized that the intervention would reduce NA and enhance PA in the participants.

Methods

Procedure

Participants were recruited from a government staff association and a non-government community center in Hong Kong. Participants must be Hong Kong citizens aged 18 or above with the ability to read Chinese and understand Cantonese. In addition to the absence of antipsychotic medications, they must have no history of cardiac diseases, hypertension, chronic coughs, asthma, hernia, acute hemorrhoid, incontinency, epilepsy, acute low back pain, or acute mental disorders at recruitment. They also must have no history of surgery in the past 3 months prior to the study and have no simultaneous participation in the other corresponding medicine methods.

Potential participants receive the research information through the association and the center. After checking their medical history, eligible individuals were invited to join the intervention. Participants were assessed at three time points (baseline (T0), immediately after (T1) and one week after the intervention (T2)). At T0, participants were asked to complete baseline demographic questionnaire and Positive and Negative Affect Schedule (PANAS). At T1 and T2, participants were asked to complete only PANAS immediately after the intervention session and during the group meeting held in August 2016. Phone surveys were conducted for those who were unable to attend the meeting.

B-TLYP Intervention

The B-TLYP intervention consisted of a one-hour workshop and a take-home booklet teaching laughter yoga exercises. The first part of the workshop started with deep breathing exercise, warm up exercise and relaxation techniques for 10 minutes. Participants clapped their hands and greeted each other in order to increase energy level and group coordination (Yazdani, et al., 2014). During clapping, participants were asked to say some numbers like “1-2, 1-2-3” to make clapping more joyful and rhythmical. They were also asked to pronounce “Ah-E-I-Oh-Woo” with a large gape in order to relax facial muscles (Ko and Youn, 2011). Following the 20-minute laughter exercise session, there was a personalized imaginary situation which allowed participants to imagine real or surreal relaxing situations (Ko and Youn, 2011). Then participants were given a negative event and instructed to handle the event with laughter or express their laughter at a different sound. The second part of the workshop included a 10-minute exercise session in which participants were asked to flex legs and move hands in accordance with the rhythm of the background music and to carry out a “ho ho ha ha grounding dance” in a relaxing and cheerful mood. At the final 10 minutes of the workshop, participants were debriefed about the significances of laughter exercise and why and how to think positively. A take-home booklet designed by our research team was used to guide the participants to practice the laughter exercises on their own after the workshop. There were six take-home learning activities modified from the

usual laughter practice (M. Weinberg, T. Hammond, & R. Cummins, 2014) for the participants to practice as shown in Table 1.

Instrument

Two instruments were used for assessment of participants:

- (1) Baseline demographic questionnaire: this questionnaire assessed age, gender, level of education, marital status, occupation, and religious status and was designed by the researcher.
- (2) Positive and Negative Affect Schedule (PANAS): this is a 20-item self-report measure of PA and NA developed by Watson, Clark, and Tellegen (1988) (Watson, et al., 1988). Items of PA include Interested, Excited, Strong, Enthusiastic, Proud, Alert, Inspired, Determined, Attentive, and Active; and items of NA include Distressed, Upset, Guilty, Scared, Hostile, Irritable, Ashamed, Nervous, Jittery, and Afraid. Participants were asked to rate the items on a 5-point scale ranging from 1 (very slightly or not at all) to 5 (extremely) according to the extent of each affect they had felt (Crawford and Henry, 2004). Low PA scores indicate sadness and lethargy while high PA scores indicate energetic, concentrated, and enjoyably engaged. Low NA scores represent calm and serene while high NA scores reflect distress (Montpetit, 2007). The Cronbach's alpha was 0.87 for the PA subscale and 0.90 for the NA subscale in this study.

Data analysis

Descriptive statistics including mean±standard deviation or frequency and percentage were summarized to describe the baseline demographics of the participants. All data were checked for normality. An outlier with a value of 3.5 was observed in the distribution of NA at T0 and hence this outlier was removed from the dataset. Repeated measures ANOVA with a Greenhouse-Geisser correction was used to examine differences in PA and NA across time (T0, T1 and T2). Post-hoc analysis using the Bonferroni correction was used for multiple comparisons of scores among time points. Data were analyzed by SPSS version 24.0. $p < 0.05$ was considered significant.

Ethical consideration

Participants were identified by codes. Their personal information and questionnaires were kept confidential in locked cabinets. Data files were password-secured and can only be accessed by the research team. Ethics approval

for this study was granted by the Hong Kong Polytechnic University Research Ethics Committee (HSEARS20160618003).

Results

Participants

This study recruited forty-five participants with mixed background. Seven participants withdrew in T1 (84% retention) and two participants withdrew in T2. The dropout rate was 21.74%, resulting in a final sample size of 36. The study flowchart is presented in Figure 1. The average age of the participants was 48.28 ± 10.72 years. Only 1 participant was non-Chinese and most of them were women (83.3%). 71.4% finished senior high school or higher education. 80.6% were married or with a partner. Regarding employment, 35.3% had a full-time job, 29.4% with a part-time job and 35.3% retired or unemployed. 71.4% reported no religion. There was no significant difference in levels of positive and negative affect between the employed and unemployed group and between the groups below and above junior secondary education ($p > 0.05$). Details of subject characteristics were summarized in Table 2.

Effect of the B-TLYP Intervention on PA across Time

Repeated measures ANOVA with a Greenhouse-Geisser correction was conducted to examine changes in affect score across time. The mean scores of PANAS PA subscale showed an ascending trend pattern ($F(1.733, 58.920) = 16.853, p < 0.001$) (Figure 2). Post hoc tests using the Bonferroni correction (Table 3) revealed a slight increase in PA scores from T0 to T1 ($p = .023$). The PA scores further rose to 3.11 at one-week-post-intervention (T2), which was significantly different from the PA scores at pre-intervention (T0) ($p < 0.001$) and post-intervention (T1) ($p = .006$).

Effect of the B-TLYP Intervention on NA across Time

Repeated measures ANOVA with a Greenhouse-Geisser correction found no significant differences in the mean scores of PANAS NA subscale between time points ($F(1.570, 53.386) = 1.861, p = .173$) (Figure 3).

Discussion

This study examined the effect of a brief take-home laughter yoga practice intervention on multidimensional affects among Hong Kong adults. Elevated level of psychological distress is a common societal problem nowadays due to growing living demands and fierce competitions in workplaces and schools. Knowing how to relax with simple strategies that can be practiced anytime and anywhere is important for promotion of good health and wellbeing at a population level. Traditional mental health interventions are administered by licensed providers and usually involve expensive services which may not be affordable for disadvantaged individuals, but these individuals are often most affected by mental health problems. There should be preventive services provided to this high risk population at a low cost or even at no cost. Laughter yoga appears to be a good choice of mental health promotion method because it is easy to learn and convenient to practice in any setting. Hence, we adapted the laughter yoga program and delivered it in a workshop format with take-home guidance provided to reinforce learning. We found that the brief intervention enhanced PA but did not significantly change NA in adults. The attrition of this study was relatively low, indicating that the intervention was acceptable to the participants, possibly because only one workshop session was involved in the intervention, and other components can be finished at the participant's own time. Our findings provide support for delivering laughter yoga as a brief intervention with take-home exercise practice as the core component.

Laughter yoga has been shown to be feasible in clinical setting (P. N. Bennett, et al., 2015). In a trial study of depressed elderly women, the laughter yoga intervention significantly improved participants' life satisfaction scores in addition to their depression scores (Shahidi, et al., 2011). In another study of patients awaiting organ transplantation, the intervention also increased participants' positive mood (Johnson, Edling, & Sethi, 2012). Evidence in non-patient populations was still limited. Among students in the nursing profession, one of the most stressful occupations, the intervention was found to improve the at-risk students' general health conditions (Yazdani, et al., 2014). Our study contributes to the literature by testing the effect of such intervention on adults in the general Hong Kong population. There is evidence to suggest that laughter, even without reason, help to promote a positive mind (Lee and Kleiner, 2005). Consistent with previous studies, we observed significant increase in PA in the participants after the intervention, demonstrating the feasibility of laughter yoga in non-clinical settings. The benefits of laughter yoga could be attributed to the health-promoting elements originated in laughter and yoga exercises, respectively. Given that PA is an important dimension of mental health (Headey, Kelley, & Wearing,

1993), changes in PA may account for the positive effects of laughter yoga on mental health, an area that has not been explored yet warrants further investigation.

In contrast to the positive changes in PA, our participants did not show any significant changes in NA after the intervention. This is different from our expectations and also was not reported in previous studies. The lack of change in NA in our study may be due to the brevity of the intervention. PA and NA are two distinct dimensions of affect (Watson, et al., 1988) and supported by independent brain systems (Lindquist, Satpute, Wager, Weber, & Barrett, 2016). They may require different levels of exposure to elicit the same response. NA was found to have a stronger link with mental disorders compared to PA (Thompson, 1991). The original purpose of laughter yoga is to increase the health benefits attributed to laughter and yoga and hence even a low-dose intervention may be able to change PA such as feeling active and enthusiastic. However, NA such as feeling upset and hostile involves more complex mechanisms. There is evidence to suggest that NA narrows one's mind by fixating on negative things (Harmon-Jones, Gable, & Price, 2013). Laughter is an exercise rather than a mental illness treatment. It may not eliminate the root cause of NA such as maladaptive thoughts. Greater intervention dose of laughter yoga might be required to affect NA. This may explain why our study had a positive impact on PA but did not change NA. The findings suggest that practice of laughter yoga, even for a brief period, can be a good health-promoting strategy for maintaining a positive mindset at least.

Strengths and limitations

This study provides preliminary support for the feasibility of using a brief laughter yoga intervention with take-home practice to improve the wellbeing of Hong Kong adults. We also measured affects and found positive effect on PA. Increased PA may play a role in reducing mental health problems in participants as found in previous studies. Such possibility should be further investigated in future studies. Several limitations of this study should be noted. First, this was a pre- and post-intervention pilot study with small sample size which reduced the generalizability and robustness of the findings. Future studies should use randomized controlled trial and population-representative sample to examine the intervention effect. Moreover, we did not include a comparison group (i.e. participants without exposure to the intervention) to verify if the results were truly due to intervention effect or time effect. Lastly, the intensity of intervention appears to play an important role in determining its success. However, we did not record the participant's frequency of performing the take-home exercises and the extent to which each

participant correctly followed our take-home exercise guidelines. Investigations into the dose threshold beyond which laughter yoga exercises reduce NA would help advance our understanding and design of interventions on laughter yoga.

Conclusions

Laughter yoga is beneficial to wellbeing. Even when it is administered at low dose, it can produce positive outcomes. Our findings support laughter yoga as a valid and time- and cost-saving strategy to promote wellbeing which may in turn reduce risk of mental disorders. Such beneficial effect appears to be stronger in PA, suggesting that PA may be the first step in the pathway linking laughter yoga to mental wellbeing. The lack of change in NA after intervention may signify NA as the second step in such pathway. This is consistent with the literature on affect that PA and NA represent two distinct emotional states. Further studies using more robust research methods and bigger sample size are needed to confirm the effect of laughter yoga on PA and NA especially among healthy subjects in younger population. Moreover, future studies should examine the mechanism by which laughter yoga affects health outcomes.

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Not applicable.

Conflict of Interest

The authors declare that they have no competing interests

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Table 1. The Six Take-Home Learning Activities

Code	Activity	Rationale
1	Clapping hands with a 1-2, 1-2-3 rhythm for three times	Clapping hands increase energy level, create a laughing mood and make people associate praise
2	Recalling a negative life event and saying “ho ho ha ha ha” for three times	Laughing with breathing from the belly (diaphragm) implies deep inhalations and exhalations (for enhancing positive thinking)
3	Creating sound and tongue movement for three times	Developing body senses
4	Doing creative exercises (e.g. big laugh with facial expression and non-verbal body movements) for three times	Reactivating our playful mind and practicing nonverbal communication
5	Voicing out “very good, very good, yeah” to oneself and others for three times	Learning to praise oneself and others
6	Recording affect and experience in the take-home diary	Reviewing the change of affect

Table 2. Subject Characteristics (n=36)

		Mean (SD)/ n(%)
Age (years)		48.28 (10.72)
Gender	Male	6 (16.7)
	Female	30 (83.3)
Nationality	Chinese	35 (97.2)
	Non-Chinese	1 (2.8)
Education	Primary school or below	4 (11.1)
	Junior high school graduation	6 (17.1)
	Senior high school graduation	12 (34.3)
	Standard college	6 (17.1)
	University degree or above	7 (20.0)
Marital Status	Single	6 (16.7)
	Married or With a partner	29 (80.6)
	Divorced or Separated or Widowed	1 (2.8)
Occupation	Full-time	12 (35.3)
	Part-time	10 (29.4)
	Retired or Unemployed	12 (35.3)
Religious	Yes	10 (28.6)
	None	25 (71.4)

Table 3: Post-hoc Analysis of Mean PA Scores between Time Points

<u>Differences in Mean PA Scores between T0 and T1</u>				
	T0 Mean (SD)	T1 Mean (SD)	Mean Difference(MD)	Sig. (2-tailed)
PA	2.62 (.68)	2.82 (.74)	.19	.023*
<u>Differences in Mean PA Scores between T1 and T2</u>				
	T1 Mean (SD)	T2 Mean (SD)	Mean Difference(MD)	Sig. (2-tailed)
PA	2.82 (.74)	3.11 (.63)	.30	0.006*
<u>Differences in Mean PA Scores between T0 and T2</u>				
	T0 Mean (SD)	T2 Mean (SD)	Mean Difference(MD)	Sig. (2-tailed)
PA	2.62 (.68)	3.11 (.63)	.49	<0.001*

Note: *p<.05

Figure 1. Study flowchart

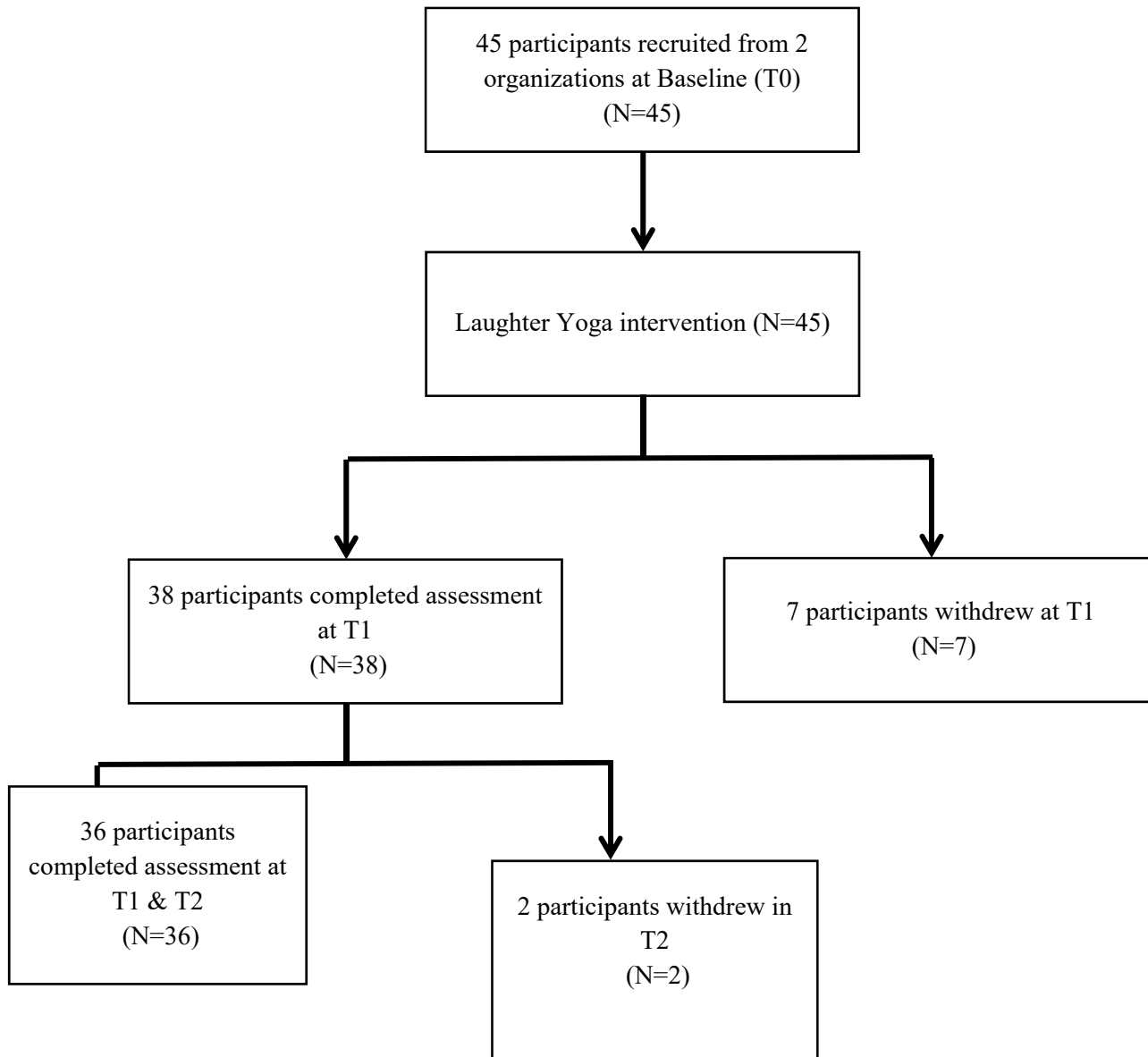


Figure 2: Mean Score of PA across time

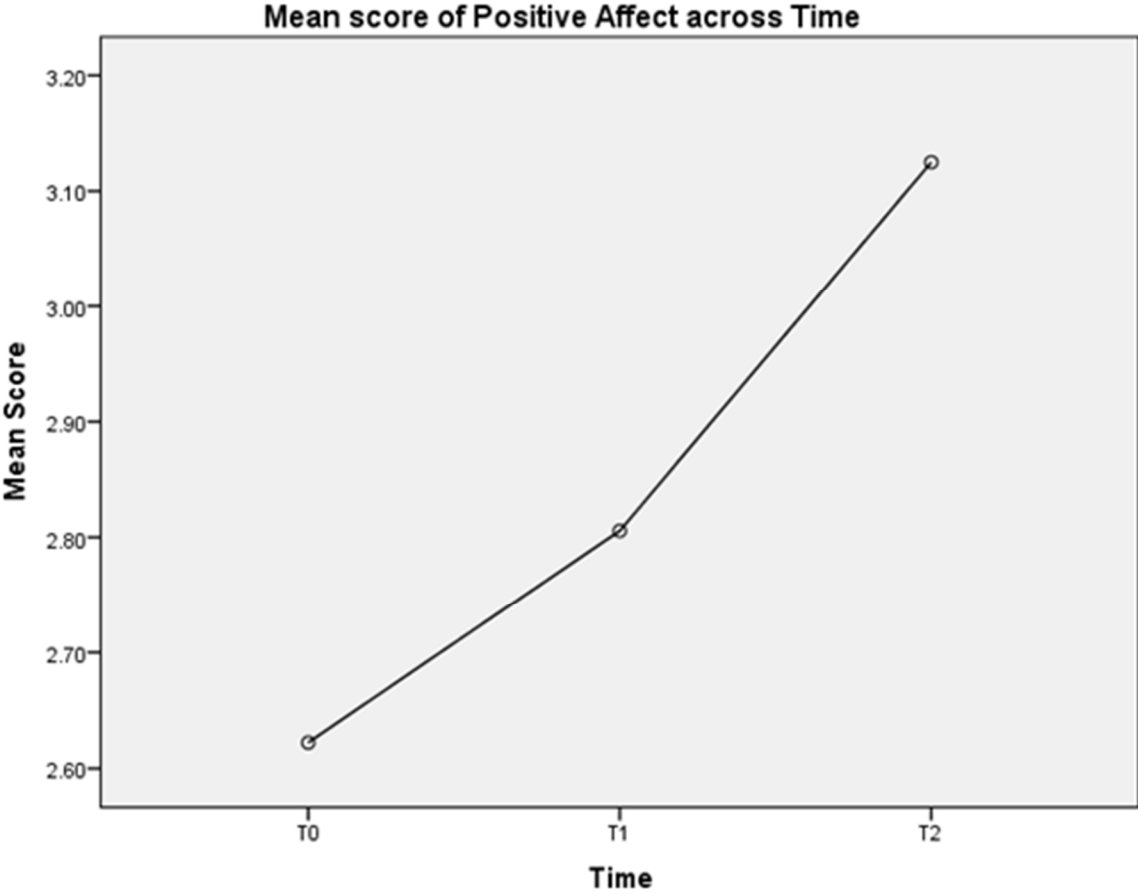


Figure 3. Mean Score of NA across time

