

## Modernization of Traditional Medicine

### Dry cupping therapy and the wellness management of health travelers

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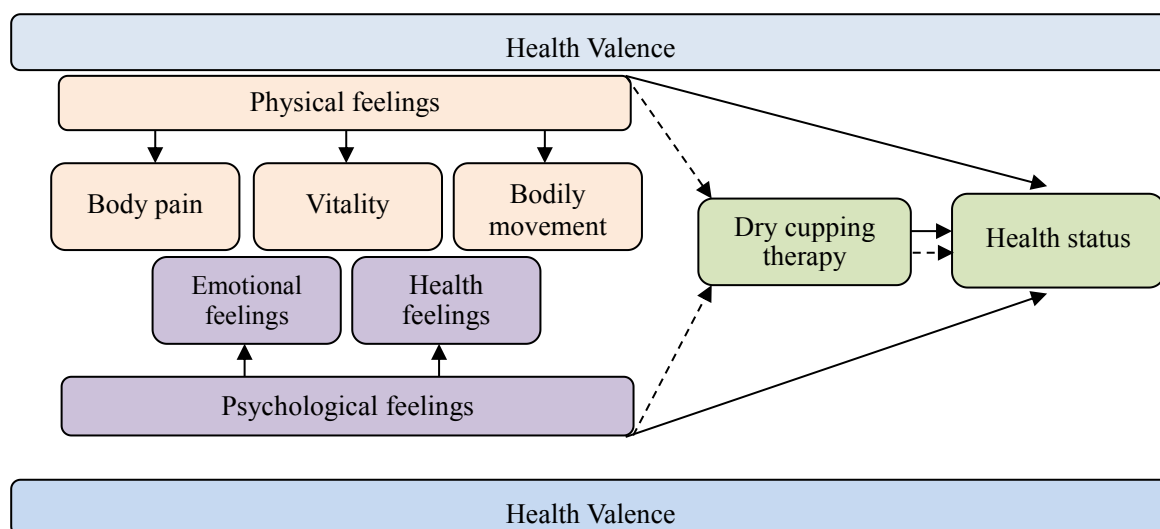
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#### Highlights

Dry cupping therapy can improve the health and overall quality of life of the people by positively influencing their physical and psychological health perceptions.

#### Editor's Summary

Cupping therapy was first mentioned in *Eber's papyrus* in the ancient Egypt, which is considered an oldest medical book published in 1550 B.C.



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## Abstract

**Objective:** Individuals travel locally and internationally in order to find alternative treatments which are less-toxic and more beneficial to their health and wellness. Despite the popularity of the western system of medicine, cupping therapies are gaining enormous attention in Pakistan as a system of traditional and complementary medicine to ensure the quality of life and wellness notions of the people. The present study aims to examine the effectiveness of dry cupping therapy (DCT) on the health, wellness, and quality of life preferences of health-seeking travelers in a sample of Faisalabad. **Methods:** DCT was performed for 15 - 20 minutes on subjects by using 3 - 5 disposable cupping glasses. Study participants filled the questionnaires before and after DCT interventions. Partial least square structural equation modeling technique is used in order to statistically analyze the data. **Results:** A total of 187 subjects participated in two DCT interventions at Coural Wellness Center Faisalabad and provided their final responses after 30 days from 2nd DCT. Respondents' perceptions of their physical feelings were generally found in a significantly positive and direct relation with DCT and health status (HS), i.e., body pain ( $\beta = 0.019$ ), vitality ( $\beta = 0.138$ ), and bodily movement ( $\beta = 0.207$ ). This trend was observed in the psychological feelings of respondents as well, i.e., emotional feelings ( $\beta = 0.169$ ). DCT significantly mediated the overall phenomenon and variance account for values were found between 20% and 80 % for all the study constructs. The scores of all the health and wellness items on the questionnaire were significantly improved in 79.68% of studied participants after 1st and 2nd DCT interventions except for social functioning. **Conclusion:** Findings of the present study suggest that DCT has an important role in determining the health perceptions and HS of health travelers without potential side-effects. It can improve the health and overall quality of life of the people by positively influencing their physical and psychological health perceptions. It additionally leads to improve travelers' emotion, behavior, and other daily matters.

**Keywords:** Wellness management, Health, Dry cupping therapy, Alternative therapies, Traveler behavior, Health and wellness tourism

## 摘要

**目的:** 个人通过在本地和国际旅行来寻找毒性更低、更有益于他们的健康的替代疗法。尽管西方医学体系很受欢迎,但拔火罐治疗作为传统医学和补充医学体系中的一种疗法在巴基斯坦获得了极大的关注,它可以提高人民的生活质量和健康观念。本研究旨在探讨干罐疗法(DCT)对费萨拉巴德寻求健康的旅行者的健康和生活质量的影响。**方法:** 用3~5个一次性玻璃罐对受试者进行15~20分钟的拔罐治疗。参与者在接受拔罐前后填写问卷。采用偏最小二乘结构方程建模技术对数据进行统计分析。**结果:** 共有187名受试者参加了费萨拉巴德法院健康中心进行的两次DCT干预,并在第二次DCT后30天内提供最终反馈。DCT干预后,参与者对身心感受的认知与健康状况呈显著正相关,如在身体疼痛( $\beta=0.019$ )、活力( $\beta=0.138$ )和身体运动( $\beta=0.207$ )。在被访者的心理感受(如情绪感受 $\beta=0.169$ )中也观察到了这一趋势。DCT显著地介导了整体现象。除社会功能外,在第一和第二次DCT干预后,79.68%的研究参与者在问卷中所有健康项目的得分均显著提高。**结论:** 本研究结果提示,DCT在确保健康旅行者的健康认知和健康状况方面具有重要作用,而没有潜在的副作用。它能够通过积极影响人们的身心健康感知来提高人们的健康和总体生活质量。它还可以改善旅行者的情绪、行为和其他日常活动。

**关键词:** 健康管理, 健康, 干罐疗法, 替代疗法, 旅行者行为, 健康和健康旅游

**Abbreviations:** CT, Cupping therapy; WCT, Wet cupping therapy; DCT, Dry cupping therapy; T&CM, Traditional and complementary medicine; CWC, Coural Wellness Center; SF-36, Short form 36; BP, Body pain; HS, Health status; V, Vitality; BM, Bodily movement; EF, Emotional feelings; HF, Health feelings; DCT, Dry cupping therapy; LV, Loading values; SEM, Structural equation modeling.

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## Background

Individual's health and wellness are shaped by the woven notions of biology, spirituality, emotionality, and lifestyle associations [1]. Despite the remarkable advancement of the 100 years old traditional western system of medicine, which diagnoses diseases and offers medical treatments through drugs, surgeries or other applicable modalities, the risk of side-effects and inefficacy in diagnosing and treating diseases, sometimes, are also acknowledged [2]. This dilemma has adversely impacted the health and wellness desires of people when countries across the globe recently reporting expectations of their individuals for a healthy and active lifestyle [3]. Recently, it has been noted that people expect to avail health and wellness treatments by experiencing alternative treatments, for example, acupuncture, dietary supplements, herbal therapy, and cupping therapy (CT) [4]. The tradition of cupping therapy is centuries old [5]. CT stands among one of the ancient methods of alternative medical treatments across different civilizations [6]. It is noted that the introduction of cupping therapy was first mentioned in *Eber's papyrus* in the ancient Egypt, which is considered an oldest medical book published in 1550 B.C. [7]. There are also numerous shreds of evidences in the history including Herodotus (a Greek historian, 400 B.C) which documents the use of cupping therapy in treating different diseases, for example, appetite disorder, headache, fainting, etc. [8]. *Historical perspective of cupping therapy* documents its existence in central Europe, the Middle East, and other Asian countries [6, 9]. The importance of CT can be ascertained from the fact that it has been acknowledged and accepted as official therapeutic practice in the Chinese hospitals since 1999 [10]. Although the popularity of CT as a method of improving individuals' health and wellness conditions is in its embryonic stage within the Pakistani context, CT treatments exist and still contribute to the nation's alternative and complementary medical system.

CT is a non-drug therapy just like scraping therapy, massage, and acupuncture. Several techniques are involved in it, for example, skin-lacerated traditional wet cupping therapy (WCT), dry cupping therapy (DCT) without skin-laceration, and moving cupping therapy which is often termed as cupping massage [11].

Despite promising effects and worthy contributions made by CT to achieve its medical objectives, CT yet suffers from some societal concerns for their general application and acceptance [12]. For example, reported skin burn incidents due to CT in Africa and China question the applicability of CT in general practices [13, 14]. Moreover, WCT (Hejama/Hijama) is often associated with unhygienic procedural arrangements and the risk of infection transmission into the human body [15]. WCT and its associated infection risk have been proved in transmitting Hepatitis B, C, and HTLV-1 [16, 17]. These reasons are contradicting to the promising notions of wellness and its management through WCT in order to bring an overall improvement in the quality of life of

health care consumers. However, this dilemma could be managed by hiring trained CT professionals and using sterilized CT tools in order to ensure health, safety, and wellness management practices through alternative therapies. From this perspective, DCT has been found safe and helpful in achieving its desired medical objectives.

Hence, the concept of wellness management revolves around the dimensions of individual's physical health, for example, body pain (BP), bodily movement (BM), psychological states, and quality of life in tandem with the satisfied levels of individuals' expectations in this overall phenomenon, etc., mental state, and interaction with the society and its environment [18]. However, wellness management is disturbed when an individual's body meets with certain physical dysfunctions which negatively influence human stature. This further leads to impact the energy production and consumption functions in the human body in tandem with the complexities of social, emotional, and psychological roles performed by individuals [19].

It is noted that health tourism involves traveling of all kinds linked to health enhancement [20]. Moreover, health tourism involves the concept of wellness tourism in its breadth and scope in tandem with the overlapping notions of medical tourism [21]. It is documented that one of the recent trends in cross-border tourism is the human's traveling quest to pursue health and wellness for bringing improvement in the quality of life [21-23]. Hence, people attempt to travel both locally and internationally to search relevant health and wellness treatments with or without the interventions of surgical procedures. Thus, the research on traditional and complementary medicine (T&CM) is gaining the attention of the scholars and professionals of the health, wellness, and medical industries recently. It is noted that T&CM practices have been observed with the unprecedented attention of the residents and travelers/tourists of both developed and developing countries [24]. It has been estimated that T&CM method of treatment has been favored by about 80% of the population of the developing countries where CTs are also considered as one of the main components of T&CM [24]. It has been observed that the impact of DCT and its association with other traditional and conventional treatment methods have been discussed and clinically trialed in order to treat different medical reasons [9, 25, 26]. However, a majority of studies lack sufficient evidence to document the effectiveness of DCT in improving the overall health, wellness, and the quality of life preferences of individuals, including patients or those individuals who desire to live quality life better than before.

Some scholars conducted small-scale research on the use of T&CM in Pakistan. These scholars focused on student population, patient population, and other specified adults in their research [27-29]. However, T&CM research in Pakistan focusing on the perceptions and responses of the population from different cohorts of life is yet succinct. Moreover, many research studies on CTs

and DCT have been conducted in different countries. However, the research on DCT in Pakistan is also on its lower empirical grounds. Hence, the present study attempts to examine and empirically elucidate the effects of DCT on the health status (HS) of the travelers in Faisalabad (Pakistan).

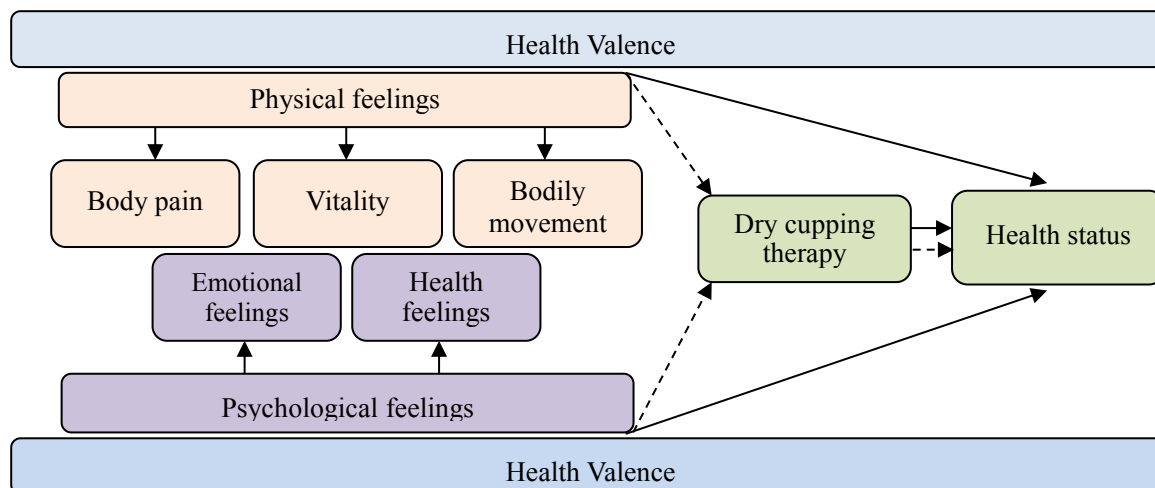
The notions of health and wellness were depicted in Figure 1 in order to examine the associations among health travelers' perceptions of their health and quality of

life, which are directly concerned with the notions of wellness concept. Additionally, it proposes that:

**Hypothesis 1 (H1):** Health perceptions have a significantly positive influence on the HS of travelers.

**Hypothesis 2 (H2):** DCT has a significantly positive influence on the HS of travelers.

**Hypothesis 3 (H3):** DCT significantly mediates the relationship between the health perceptions of travelers and their HS.



**Figure 1 Health valence: the associated framework of DCT and health status**

DCT, Dry cupping therapy.

## Methodology

### Research design, settings, and ethics

In order to achieve the study objectives, the present study incorporates quasi-experimental (pre-post assessment) design. Nevertheless, this research is also accompanied by examining the direct influence of health perceptions about the quality of life and the mediating role of DCT in this overall phenomenon. The study was conducted in Coural Wellness Center (CWC) Faisalabad, Pakistan, a non-profit health care center that purposefully serves patients with Pakistani herbal medicine, Unani medicine, Chinese traditional medicine, and homeopathy in tandem with various therapies including yoga, acupuncture, warm-baths, and gymnasium which are managed under the patronage of Coural Associates. Necessary official approval was sought prior to conducting the study from the resident officer of CWC.

### Subjects

Study subjects were recruited via advertising banners for preventive and wellness CT at different squares of main Faisalabad city. Faisalabad city has a mixture of different attractions, that is, culture, business, food, and heritage tourism attracting travelers from different parts of the country. Hence, the likelihood of a variety of sample was present in Faisalabad population. In order to assess the eligibility of interested subjects, a research assistant first

screened subjects over the telephone. Inclusion criteria of the study was based on facts that participants should be between 18 and 80 years of age, not suffering from any serious mental or physical disease, not taking phenytoin, codeine, chemotherapy, immunosuppressive drugs, or anticoagulants, as well as residents or travelers in Faisalabad, and willing to participate in DCT study with their written informed consent. Additionally, it was also considered that female participants should not be breastfeeding, pregnant, or menstruating. Among 357 phone-calls' screening interviews between October 19, 2017, and November 7, 2017, 321 subjects were finally invited and requested to confirm their participation in DCT sessions scheduled between December 10, 2017, and December 31, 2017, at CWC Faisalabad.

### Materials and procedures

This study will report results from two perspectives. The first perspective is based on two sub-dimensions, that is, whether health perceptions, physical states, psychological states, directly influence the HS/quality of life of individuals or not, and whether DCT has any of its mediating role in influencing the relationship between the health perceptions and the HS of study respondents. Second, the response of study subjects will be examined in order to note their feelings about the quality of life before and after DCT interventions following the quasi-experimental design.

In order to collect data on health perceptions, wellness, and quality of life outcome in tandem with the role of DCT intervention, a questionnaire was developed. BP variable was measured by adopting the validated instrument of Pain Perception Scale [30], vitality (V) was measured by adopting items from short form 36 (SF-36) health survey questionnaires [31], and general BM/function was measured by adopting validated instruments from Pain Perception Scale and SF-36 [30, 31]. Psychological feelings constructs were also measured by adopting validated instruments, emotional feelings (EF) were measured by adopting the validated instruments of HADS scale (hospital anxiety and depression scale) [32], and physical feeling scale [33] because of its certain physiological premises, health feelings (HF) were measured by adopting the validated scales of SF-36 and physical feeling scale [31, 33]. HS outcome was measured by adopting the validated instruments of SF-36, while questions on DCT interventions were added. Physical, mental, and general health and wellness perspectives were made part of the questionnaire in tandem with questions on the evaluation of physical problems and functioning, mental health and functioning, social functioning, vitality, and pain sensation in the body [34]. Moreover, all validated instruments were little adjusted according to the nature of the present study. Study subjects were requested to rate responses about their feelings of health, wellness, and the quality of life on a seven-point Likert scale of 1-7; where lowest score was given number 1, while the most ideal situation was given number 7. The questionnaire also incorporated questions to collect demographic information about subjects, for example, gender, age, educational level, and occupation. The questionnaire was completed in three parts, the first response was taken immediately following the first DCT intervention, second response was taken after 48 hours of the first DCT intervention, and the third part was completed by contacting study participants over the telephone after 30 days from the second DCT intervention. Data on complications, feelings of wellness, better physical and mental health, and improvement in the quality of life were gathered by asking questions to individuals who participated in the present study.

Before DCT interventions, researchers of the present study made sure that inclusion criteria had been met by the study subjects. This was done by conducting a brief interview prior to DCT interventions. Additionally, an oral explanation was provided to subjects about DCT and a printed questionnaire was handed over to them. Questionnaires were filled by the subjects and mentioned their present states prior to first DCT intervention, and thereby confirming their informed consent in writing. Questionnaires were filled under the supervision of researchers and the presence of professional trainers with DPT certifications. Study subjects also agreed to revisit

CWC Faisalabad within 48 - 72 hours from the first DCT intervention, and provided their telephonic responses after 30 days from the second DCT intervention about changes in their body and health as well as about the feelings of wellness and quality of life. However, 24 of the participants were excluded before proceeding to first DCT interventions due to their scheduling and follow up reasons.

A total of 297 subjects were then directed towards the designated experimental DCT rooms and requested to lie down in a prone position. After cleaning the area between shoulders and middle of the back, DCT was performed at the back of subjects through disposable cupping glasses by inverting 3-5 glasses, each with a 25-50 mm diameter. A manual hand pump was handled in order to create a vacuum and suction inside the cups. The created vacuum drew up the skin of subjects inside each cup [35]. The created vacuum was directly associated with the tolerance level of subjects. Cupping glass suction was gradually increased which further expanded skin inside the glass and turned skin color into red. It has been noted that increased blood circulation, autohemolysis, and muscle tension are further associated with the reasons of changing skin color [36]. DCT was performed for 15-20 minutes up to two times in 72 hours (allowing 48 hours in between the first and second DCT interventions) with the assistance of seven CT therapist. After DCT sessions, the participants were allowed to rest for a while and then requested to leave DCT experimental room. After experiencing DCT, the participants were further advised to refrain from bathing for a couple of days.

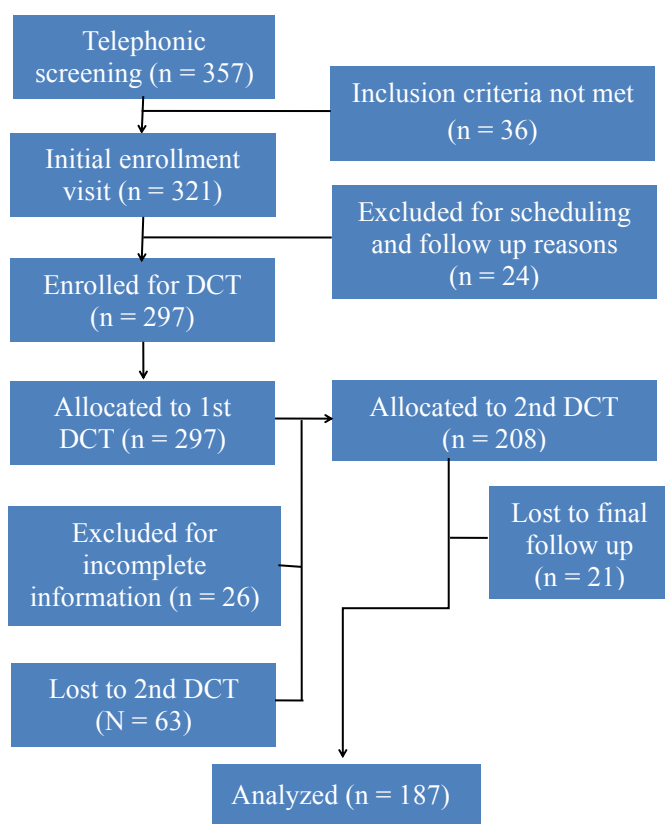
### Statistical design

Gathered responses were statistically analyzed through partial least square structural equation modeling (SEM) technique using Smart partial least square-SEM in order to measure the direct/indirect significance levels of health perceptions and DCT intervention on the HS of travelers in Faisalabad. SEM was additionally considered appropriate in order to examine the results of pre-post assessments of DCT interventions by calculating mean and standard deviation. An alpha coefficient of 0.05 at 95% confidence interval was considered effective for all statistical measurements. Descriptive analysis was performed by calculating percents, cumulative percents, minimum and maximum levels of the mean and standard deviation.

### Results

A total 297 subjects filled questionnaires before and after first DCT intervention, however, 26 of the subjects did not provide full information. Hence, considered their responses as incomplete, 63 subjects are excluded because subjects did not visit therapy clinic for second DCT intervention. 21 subjects were excluded because no

telephonic response was received after a couple of attempts made by the researchers for the final response of study participants. Finally, 187 subjects' data were retained (Figure 2) and statistically analyzed in the system. Table 1 results show the demographic profiles of study respondents. Results show that 126 of study participants (67.38%) were females and 61 were males (32.62%) with mean  $\pm$  standard deviation age as  $35.62 \pm 8.89$ . Majority of the participants were the residents of Faisalabad city (54.55%) followed by travelers from other cities. Majority of the participants were between age cohorts of 18 and 50 years. Only 28 (14.96%) subjects were having the college or above level of educational background. 74 (39.57%) subjects were having contractual nature of work.



**Figure 2** The screening and recruitment of participants DCT, Dry cupping therapy.

### Measurement model results

The questionnaire, which is developed by adopting items from different standardized tools and adjusted according to the context of the study, including three questions for BP, three questions for V, three questions for BM, three questions for EF, three questions for HF, four questions for DCT, and five questions for HS. These questionnaire items are presented by calculating loading values (LV). LV are helpful to evaluate and explain various constructs in tandem with their reflective and latent meanings impartial least square -SEM analysis. Moreover, LV are considered important to analyze the associations of reflective and latent variables. It is noted that LV should be more than the threshold level of 0.70 in order to show

the 0.50 level of variance in latent variables [37, 38].

Table 2 results show that all LV of this study were significant at 0.05%, and greater than 0.70, showing convergent validity. Composite reliability, Cronbach's alpha values (for internal consistency measures), and construct level average values were found appropriate, i.e.,  $> 0.60$ ,  $> 0.70$ , and  $> 0.50$  respectively [38, 39]. Constructs' level average square root were found greater than reflective items correlations, hence, showing discriminant validity [38, 40]. Heterotrait-monotrait results (Table 3) were further supporting to discriminant validity as well [40], i.e.  $< 0.85$  or  $0.90$ .

### Structural model evaluation

Co-efficient of determination ( $R^2$ ) value for endogenous variables was over 0.1 % level, and found appropriate as presented in Table 2 and Figure 3 [40]. The values of  $f^2$  and  $Q^2$ , showing effect sizes, were found fluctuating (Table 4), from lower to maximum limits, i.e. 0.02 (lower), 0.15 (medium), and 0.35 (maximum) limits [37].  $\beta$  and  $P$  values (Table 4) were supporting significantly positive relationships of BP ( $\beta = 0.192$ ,  $P = 0.003$ ), vitality ( $\beta = 0.138$ ,  $P = 0.001$ ), BM ( $\beta = 0.207$ ,  $P = 0.001$ ), and EF ( $\beta = 0.169$ ,  $P = 0.004$ ) at 0.05 level with HS except for general HF ( $\beta = 0.093$ ,  $P = 0.065$ ). Moreover,  $\beta$  and  $P$  values for dry cupping therapy were found having significantly positive influence on the quality of life outcome ( $\beta = 0.213$ ,  $P = 0.002$ ).

### Mediation testing

In order to examine the mediating role of DCT, a non-parametric bootstrapping method was used [38, 41]. Table 5 shows that DCT had a significant positive influence in mediating the relationship between all the constructs of physical feelings and psychological feelings with the HS ( $t > 1.96$ ,  $P = 0.05$ ). The indirect effect of lower beta values for each construct as compared to direct beta values were supporting to note that DCT absorbed a certain percentage of direct impact [41].

Table 6 results further show the detailed results of the constructs of physical feelings and psychological feelings, by taking a comparative analysis of subjects' pre and post assessment with DCT interventions. Paired t-test results show that health and wellness status of study participants significantly improved after 1st and 2nd DCT interventions for general physical health, general mental health, emotional balance, and expressions, feelings of relaxation, inner peace, vitality, sleeping, movement out of bed, sitting, or working, and good mood along with DCT satisfaction, and were found significant (All  $P < 0.05$ ). It is also found that subjects reported their social functioning improvement after 1st and 2nd DCT interventions; however, paired t-test results show that the differences between pre and post assessments of social functioning after 48 hrs from the 1st DCT, and 30 days from the 2nd DCT intervention, were not statistically significant ( $P = 0.057$ ). By analyzing study's results, it has also been found that health and wellness status of

participants significantly improved through the quality of life measures after 1st and 2nd DCT interventions. However, all health and wellness items in tandem with DCT satisfaction were found better at their mean and

standard deviation values after 2nd DCT intervention as compared to 1st DCT intervention except for social functioning. These results are presented in Table 6.

**Table 1 Socio-demographic profiles of study respondents**

Variable	N	%	CP
<b>Gender</b>			
Male	61	32.62	32.62
Female	126	67.38	100
Total	187	100	
<b>Domicile of study participants</b>			
Faisalabad	102	54.55	54.55
Lahore	15	8.02	62.57
Islamabad	11	5.88	68.45
Jhang	17	9.09	77.54
Sargodha	8	4.28	81.82
Sheikhupura	9	4.81	86.63
Chiniot	12	6.42	93.05
Jaranwala	13	6.95	100
Total	187	100	
<b>Age groups (Years)</b>			
18 - 30	36	19.25	19.25
31 - 40	49	26.20	45.45
41 - 50	29	15.51	60.96
51 - 60	34	18.18	79.14
61 - 70	22	11.76	90.91
71 - 80	17	9.09	100
Total	187	100	
<b>Highest education level</b>			
No School	41	21.93	21.93
Elementary school	57	30.48	52.41
High school	61	32.62	85.03
College and above	28	14.97	100
Total	187	100	
<b>Work Status</b>			
Permanent	52	27.81	27.81
Contract	74	39.57	67.38
Daily Wages	61	32.62	100
Total	187	100	

N, Number of subjects; CP, Cumulative percentage.

Table 2 Results presented for measurement model

Item level constructs	Items	LV	CR	$\alpha$	AVE	SQRT (AVE) > Cor <sup>2</sup>	R <sup>2</sup>
Body Pain	BP 1	0.765	0.853	0.797	0.629	0.763 > 0.611	
	BP 2	0.841					
	BP 3	0.799					
Vitality	V 1	0.748	0.881	0.814	0.617	0.812 > 0.687	
	V 2	0.837					
	V 3	0.813					
Bodily movement	BM 1	0.885	0.812	0.843	0.737	0.791 > 0.613	
	BM 2	0.862					
	BM 3	0.726					
Emotional feelings	EF 1	0.812	0.902	0.861	0.641	0.831 > 0.725	
	EF 2	0.866					
	EF 3	0.848					
Health feelings	HF 1	0.767	0.883	0.910	0.713		
	HF 2	0.805					
	HF 3	0.887					
Dry cupping therapy	DCT 1	0.819	0.914	0.791	0.739	0.841 > 0.743	0.628
	DCT 2	0.832					
	DCT 3	0.793					
	DCT 4	0.868					
Health status	HS 1	0.853	0.898	0.836	0.701	0.817 > 0.792	0.715
	HS 2	0.879					
	HS 3	0.816					
	HS 4	0.863					
	HS 5	0.781					

BP, Body pain; HS, Health status; V, Vitality; BM, Bodily movement; EF, Emotional feelings; HF, Health feelings; DCT, Dry cupping therapy; LV, Loading values; AVE, Average Variance Extracted;  $\alpha$ , Cronbach's alpha; CR, Composite Reliability; Cor<sup>2</sup>, Correlation (highest squared between model constructs); R<sup>2</sup>, Co-efficient of determination; Level of significance (2-tailed) = 0.05.

Table 3 Results presented for heterotrait-monotrait (HTMT) analysis

	BP	V	BM	EF	HF	DCT	HS
BP	1.000						
V	0.815	1.000					
BM	0.789	0.765	1.000				
EF	0.774	0.782	0.763	1.000			
HF	0.801	0.659	0.689	0.717	1.000		
DCT	0.769	0.693	0.661	0.832	0.746	1.000	
HS	0.797	0.612	0.637	0.839	0.763	0.826	1.000

BP, Body pain; HS, Health status; V, Vitality; BM, Bodily movement; EF, Emotional feelings; HF, Health feelings; DCT, Dry cupping therapy;



Table 4 Direct-effect path coefficients

Structural path	$\beta$ (t-values)	$f^2$	$q^2$	95 % CI	P value
BP → HS	0.192 (3.169)	0.18	0.18	(0.074- 0.269)	0.003
V → HS	0.138 (3.371)	0.07	0.07	(0.058-0.127)	0.001
BM → HS	0.207 (3.152)	0.12	0.12	(0.104-0.289)	0.001
EF → HS	0.169 (2.644)	0.19	0.21	(0.136-0.294)	0.004
HF → HS	0.093 (2.637)	0.07	0.07	(-0.036-0.148)	0.065
BP → DCT	0.170 (3.128)	0.09	0.09	(0.004-0.156)	0.000
V → DCT	0.116 (2.793)	0.11	0.13	(0.137-0.272)	0.045
BM → DCT	0.198 (3.357)	0.14	0.14	(0.036-0.149)	0.061
EF → DCT	0.103 (2.429)	0.13	0.13	(0.107--0.259)	0.001
HF → DCT	0.197 (3.418)	0.11	0.11	(0.143-0.349)	0.000
DCT → HS	0.213 (3.794)	0.16	0.16	(0.107-0.266)	0.002

BP, Body pain; HS, Health status; V, Vitality; BM, Bodily movement; EF, Emotional feelings; GHF, General health feelings; DCT, Dry cupping therapy; CI, Confidence interval.

Table 5 Mediation/indirect effect and relationship verifications

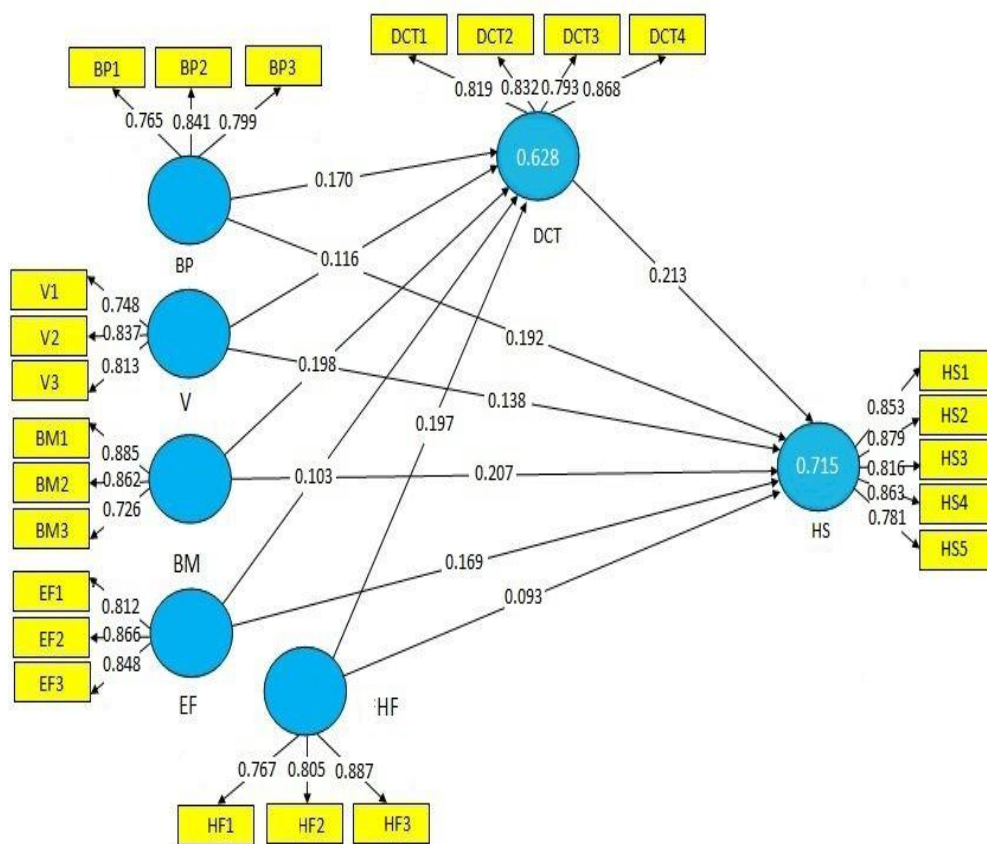
Effect of constructs	$\beta$ (t - values)	$\beta$ (t - values)	Total effect	VAF	Interpreted results
BP → DCT → HS	0.192 (3.169)	0.061 (2.357)	0.253	28.59	Partial mediation
V → DCT → HS	0.138 (3.371)	0.103 (2.849)	0.241	26.17	Partial mediation
BM → DCT → HS	0.207 (3.152)	0.155 (2.614)	0.362	38.14	Partial mediation
EF → DCT → HS	0.169 (2.644)	0.076 (3.459)	0.245	27.13	Partial mediation
HF → DCT → HS	0.093 (2.637)	0.047 (1.986)	0.140	21.16	Partial mediation

BP, Body pain; HS, Health status; V, Vitality; BM, Bodily movement; EF, Emotional feelings; GHF, General health feelings; DCT, Dry cupping therapy; VAF, Variance account for, < 20% (no mediation), 20% - 80% VAF (partial mediation), 80% VAF (full mediation) [38]

**Table 6 Pre-post wellness assessment of study subjects receiving DCT interventions**

Variables	Pre-assessment before 1 <sup>st</sup> DCT	Post-assessment (48 hrs after 1 <sup>st</sup> DCT)	Post-assessment (30 days after 2 <sup>nd</sup> DCT)	Paired t-test	P-value
	Mean ± standard	Mean ± standard	Mean ± standard		
General physical health	11.4 ± 6.6	13.1 ± 6.9	16.3 ± 7.1	8.187	0.002
General mental health	19.1 ± 7.2	23.7 ± 7.5	26.5 ± 7.6	10.069	0.001
Social functioning	18.3 ± 5.8	19.1 ± 6.3	20.4 ± 6.9	6.514	0.057
Emotional balance and expressions	27.5 ± 7.7	29.7 ± 8.2	33.4 ± 8.1	12.501	0.004
Feeling of relaxation	23.6 ± 7.2	24.2 ± 7.6	26.3 ± 7.8	11.377	0.000
Inner peace	16.3 ± 6.1	16.8 ± 6.2	17.1 ± 6.6	9.124	0.017
Vitality	17.4 ± 5.1	19.3 ± 5.7	22.8 ± 5.9	10.248	0.039
Sleeping	17.4 ± 5.1	19.7 ± 7.2	22.6 ± 7.5	10.713	0.001
Movement out of bed, sitting or working	15.2 ± 4.5	17.5 ± 5.3	19.9 ± 5.7	9.371	0.016
Feeling of good mood	16.7 ± 5.9	18.4 ± 6.4	21.5 ± 6.6	9.429	0.021
Satisfaction with DCT	22.1 ± 4.7	23.4 ± 5.3	27.2 ± 5.4	10.136	0.042

DCT, Dry cupping therapy.



**Figure 3 Structural model: Results for DCT and health status**

BP, Body pain; HS, Health status; V, Vitality; BM, Bodily movement; EF, Emotional feelings; HF, Health feelings; DCT, Dry cupping therapy

20.33% of the participants reported post DCT complications. Among thirty eight participants, who reported post DCT complication, pain on cupping area was reported by thirteen participants, followed by six participants with restlessness and five participants who reported itchiness due to cupping. However, among remaining fourteen persons who reported complications after DCT interventions, four participants felt discomfort, three participants felt muscle tenderness, two participants felt a light headache, two participants felt dizziness, one participant felt fatigue, and one participant reported low blood pressure and eating problem.

## Discussion

Present study's results show that health perceptions with the sub-constructs of physical feelings and psychological feelings are significantly related to the HS of individuals. These associations are further solidified with the DCT interventions. The present study results show that the health and wellness status of study respondents were improved after receiving DCT treatments. It has been noted that the participants reported significantly positive impacts of DCT interventions on their overall health and wellness which helped them to manage their other daily functions. More precisely, significantly positive improvements are observed for general physical and mental health, emotions and expressions, relaxation, quality of sleep, inner peace, and satisfaction after receiving second DCT intervention as compared to first DCT intervention. Social functioning is not found statistically significant as being reported by the study's participants; however, it still shows improvement after 1st and 2nd DCT interventions. Hence, the overall quality of life in terms of health and wellness of individuals improved after receiving DCT treatments. These results are in line with some existing studies [42], and wellness notions noted in other literature [43]. After pre and post analysis, the findings of the present study show that movement out of bed, sitting, and working also significantly were improved after 1st and 2nd DCTs. Since these aspects come under routine matters, the present study's findings support results and discussions in some studies where it is noted that CTs improve clients' management of their daily life matters [44]. However, it is to be noted that the number of DCT interventions and the time period to feel its effects may be helpful in order to appropriately examine the overall health and wellness of people. Participants of the present study were recruited from different places in Faisalabad city for a period of consecutive nineteen days. Hence, this eliminated time and place biases which may improve the efficacy of CTs [42].

DCT interventions and post-assessments show that health and wellness status were positively improved. However, overall health and wellness were improved and

reported by the majority of study participants without severe muscle tenderness, discomfort, or restlessness problems. These results are in line with a study conducted by Markowski *et al.* [45]. However, a total of thirty eight participants reported minor post DCT complications. More precisely, subjects reported pain on cupping area, restlessness, itchiness, discomfort, and muscle tenderness. Some participants felt light headache, dizziness, and low blood pressure as well as eating problems. These complications might be due to more vacuum pressure inside cups or hard movement of cupping glasses. Although these are minor complications, the physicians and DCT experts need to minimize the side effects of DCTs, which will consequently help to satisfy subjects in tandem with improving their health and wellness. Nevertheless, DCTs were found helpful in bringing overall improvements in respondents' emotions, behaviors, and other daily activities. WCT was been associated with bringing improvement in the peripheral nervous system by drawing blood flow in order to stimulate skin and muscles which ultimately results in comfort and relaxation [46]. Vacuum generation, skin suction and holding blood flow inside cups under the skin without laceration also proved rest, relaxation, and overall feeling of wellness among present study participants. Hence, the present study's results extend scientific research from WCT interventions to DCT interventions and proved WCT notions of comfort, rest, and relaxation in order to bring overall health and wellness among healthcare seekers.

Research on T&CM is gaining enormous attention. This is because of the changing interests and preferences of individuals across the globe struggling to improve their quality of life and avoid threats of non-communicable diseases [21]. The research on dry cupping therapies as a part of T&CM has not been fully explored especially in some untapped markets like Pakistan. This research extends the application of T&CM with the help of DCT among the Pakistani health enhancement seekers, i.e. residents, tourists, travelers, visitors, and endeavors to fill theoretical and empirical research gaps in the relevant fields.

## Conclusion and recommendation

In conclusion, findings of the present study are found promising by documenting that DCT has a significant importance in order to improve the health perceptions and quality of life preferences of health enhancement seekers. The residents and tourists/travelers in the city of Faisalabad positively reported improvement in their HS after experiencing DCT interventions. DCT interventions are noninvasive with minor post-procedure complications as compared to WCT or other therapies/procedures in the conventional western medical system. Hence, the role of DCT should further be investigated in order to examine

behavioral changes among different study population and by conducting multicenter studies. The association of DCT with allopathic treatments should be investigated in order to develop a better understanding and the conceptualization of wellness with alternative therapies. This will ensure to deliver a high quality of life which healthcare consumers endeavor to find across the world. This will help to draw firm evidence of DCT in recent medical systems where some scholars note that alternative health and wellness treatments are preferred by medical tourists and other health travelers in order to manage a healthy lifestyle and live a better quality of life [21]. Moreover, DCT is safe and can easily be managed in clinical trials and home-based settings. Considering the benefits and efficacy of DCT, CTs should not only be practiced by eastern traditional medicine practitioners but allopathic practitioners may benefit from its healing powers. DCT may help allopathic practitioners to treat and satisfy their patients with alternative therapies. It may strengthen the notions of better health and quality of life with the integrated focus of eastern and western medical systems.

### Ethical approval

All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. NHS research ethics committee number: 10/H1202/69.

### Informed consent

Informed consent was obtained from all individual participants included in the study.

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