



Do hand outcome measures reflect cultural influences?



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ABSTRACT

Objective: The aim of this study was to compare the activities listed in DASH, MHQ, QuickDASH with the activities listed in Canadian Occupational Performance Measure (COPM) in a Turkish patient population with hand injury.

Methods: COPM questionnaire was administered to 163 participants (61 male and 102 female; mean age 40.72 ± 13.70 years). The activities that were stated in COPM were categorized and checked whether they were present in DASH-T, MHQ, QuickDASH.

Results: The highest rated stated activities were “carrying a heavy object” (39.2%), “cleaning the house” (25.7%) and “writing” (15.9%). DASH reflects 30% whereas MHQ and QuickDASH reflect 16.32% and 10.2% of the problematic activities, respectively.

Conclusion: None of three questionnaires have satisfactory results for reflecting the problematic activities among hand injured Turkish people. Open ended interviews should be irrevocable part of assessment process in order to describe a person-center treatment program.

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Introduction

It is a commonly held belief by occupational practitioners that the intervention provided for people with physical disabilities should extend beyond a focus on recovery of physical skills and address individuals' engagement in occupations.¹

Upper extremity has a vital role in performing occupations and it has been reported that people with hand injuries may not be able to engage in activities successfully and they experience a variety of difficulties in their daily occupations.^{1,2} It is therefore significant that hand therapists and surgeons know the problems and the needs of patients in activity basis to tailor an effective intervention plan.^{1,3}

According to American Occupational Therapy Association (henceforth named as AOTA), Activities of Daily Living (henceforth

called as ADL) are fundamental to living in a social world thereby enabling basic survival and well-being.⁴ The meaning of hand use in activities is related to participation and is influenced by socio-cultural values, beliefs, and expectations. Hand usage choice differs according to ADL which are tailored with an individual's occupation and culture. Hence, the assessment of activities should cover the understanding of the values and beliefs of the person and be sensitive to the person's culture.⁵

There are some outcome measures which are generally used in hand rehabilitation settings for measuring activity limitations. Disabilities of Arm, Shoulder and Hand⁶ (henceforth named as DASH) and Michigan Hand Outcome Questionnaire⁷ (henceforth named as MHQ) receive strong ratings, and the studies report reliability, validity, and responsiveness of these scales in upper extremity injuries.^{8,9} They can also be used in Turkish population because of the fact that their version is valid and reliable among people with hand injuries.^{10,11} Nonetheless, the activities measured in these scales reflect the activities of the western countries.

The Canadian Occupational Performance Measure¹² (henceforth named as COPM) is also found to be suitable for determining problems and the needs of people with hand injuries. COPM is useful in decision making process, and measures activity limitation and participation as well as allowing people to state their individual

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concerns.¹ In hand therapy, it is helpful to be aware of ADLs practiced by people from different cultures² and COPM can reflect cultural differences among people with hand injuries.¹

The challenge, nevertheless, is to know the best tool to measure the necessary information in a practical way.⁹ The concern of culture in hand therapy practice has been addressed in a number of studies,⁵ but the use of mostly preferred outcome measures in different cultures is not analyzed yet. Therefore, from another perspective and going beyond the previous studies, the purpose of the study is to determine whether outcome measures used in hand therapy reflect the limited activities of Turkish population with hand injuries. In concordance with this aim, the research questions that are employed in the present study are as follows:

1. In which activities do Turkish people with hand injuries have difficulty?
2. Do commonly used outcome measures comply with the activities stated by COPM?
3. Which important activities according to Turkish culture are not mentioned in outcome measures?
4. Which outcome measure reflects the problems of Turkish people with hand injuries?

Material and methods

Participants

The participants that are employed in the present study are one hundred and sixty-three participants with hand injuries between the years 2013 and 2015. All the participants had hand injuries and the ones with additional shoulder and elbow injuries, lower limb injuries, systemic diseases and hearing or visual impairment that would affect the communication were not involved in the study. Additionally, all participants were born and raised in Turkey. Prior to data collection, each participant submitted informed written consent to participate in the study. All procedures followed were in accordance with the ethical standards of the responsible committee on human experimentation (institutional and national) and with the Helsinki Declaration of 1975, as revised in 2000. Informed consent was obtained from all patients for being included in the study.

Questionnaires

The data in the present study come from four questionnaires, namely COPM, DASH, MHQ and Quick DASH:

First and foremost, COPM questionnaire was used to determine the main problematic activities of participants regarding their injuries. COPM was created by Law et al in 1990 with an aim to address the problematic activities which were important for a person. COPM is based on semi-structured interviews and helps practitioners set therapy goals through a person-centered perspective. Within the questionnaire, a person should state his/her five problems of activities of daily living (ADL) maximum in three different activity areas which are self-care, productivity and leisure.¹²

Besides COPM, DASH was also used in the present study. DASH is a self-reported questionnaire consisting of 30 items that evaluate physical function and disability among people with upper extremity disorders.⁶ The first 21 items of DASH are about ADLs and the rest of it -other 9 items-are about the symptoms of participants; hence, the first 21 items were used in this study to compare the activities with the activities stated in COPM. In fact, DASH has 8 more items regarding sports/music and work, yet they were not used in the present study. There is also the Turkish version of DASH (DASH-T) and it was published in Duger et al.¹⁰

In addition to COPM and DASH, another questionnaire used is MHQ. MHQ is a hand-specific outcome questionnaire with fifty-seven items in six different domains. These domains are overall hand function, activities of daily living, pain, work performance, aesthetics, and patient satisfaction. All the domains except two -work performance and pain-assess each hand separately and are scored according to the affected hand.⁷ The Turkish version of MHQ was published by Oksuz et al.¹¹ In the present study, nonetheless, MHQ's twelve items in activities of daily living domain were used to compare them with COPM activities.

Last but not least, the QuickDASH was also used in the present study. The QuickDASH is a shortened version of DASH, yet it consists of eleven items. Items in the questionnaire inquire into the pain, tingling, weakness and stiffness, activities of daily living, social activities, work and sleep. The QuickDASH, moreover, involves 6 items that question physical activities which were used in this study with an aim to compare them with COPM mentioned activities.¹³ The Turkish version of QuickDASH was indeed formed by Koldas Dogan S. et al. and found to have a high internal consistency and test-retest reliability.¹⁴

Method

Demographic data collection – such as age and gender and COPM questionnaire were administered on the day of the participant's initial examination by an occupational therapist. The administration of COPM lasted approximately for 30–45 min for each participant. Having gathered the data, the activities that were stated in COPM were listed and they were checked whether they were present in DASH-T, MHQ and QuickDASH (see Table 1). Moreover, in the present study, the term “sub activity” was used to describe different tasks of activities. To exemplify “buttoning up a blouse or shirt” was used as a sub activity, which was in fact a part of “dressing” activity.

Furthermore, the COPM stated activities were categorized into Activities of Daily Living (ADL), Instrumental ADL (IADL), Rest and Sleep, Education, Work, Plan, Leisure and Social Participation areas according to Occupational Therapy Practice Framework: Domain and Process 3rd Edition. Some activities which couldn't be categorized were grouped in the “Other” section.

Results

In total, one hundred and sixty-three participants (61 male, 102 female) with upper extremity injuries participated in the study. The mean age of participants were 40.72 ± 13.70 years (male 34.18 ± 13.58 , female 44.63 ± 12.29) and the hand injuries of participants were fractures (36.8%, $n = 60$), crush injuries (7.9%, $n = 13$), carpal tunnel syndrome (34.9%, $n = 59$) and tendon injuries (19%, $n = 31$).

In COPM, a total of 612 activities were stated by all the participants. Ninety seven of the activities which were work, instrument and/or sports related, sleeping activities and statements as “grasping” that could not be categorized in any group were excluded from the data. After the exclusion of the above-mentioned activities, 515 activities remained to be analyzed and 49 activities were found as common. In the analyzing process of the activities 13 ADLs, 32 IADLs, 3 leisure and 1 education activities were grouped according to Occupational Therapy Practice Framework: Domain and Process 3rd Edition (see Table 2). The top three highly stated activities were “carrying a heavy object” (39.2%, $n = 64$), “cleaning the house” (25.7%, $n = 42$) and “writing” (15.9%, $n = 26$) (for other activities, see Table 2). The activities which were mentioned the highest (“carrying a heavy object”, “cleaning the house”, “overhead activities”, “cooking” and “using knife”) were IADLs, except “writing” which was grouped as educational activity (see Table 2).

Table 1
Activities determined by COPM and its comparison with questionnaires.

Main activity	Frequency (n, %)	DASH (Yes/No)	MHQ (Yes/No)	QuickDASH (Yes/No)
Carrying a heavy object	64, %39.26	Yes (item 11: Carry a heavy object (over 10 lbs))	No	No
Cleaning the house	42, %25.76	Yes (item 7: Do heavy house chores (e.g., wash walls, wash floors))	No	Yes (item 2: Do heavy house chores (e.g., wash walls, wash floors))
Overhead activities	26, %15.95	Yes (item 6: Place an object on a shelf above your head)	No	No
Writing	26, %15.95	Yes (item 2: Write)	No	No
Cooking	23, %14.11	Yes (item 4: Prepare a meal)	No	No
Using knife	21, %12.88	Yes (item 16: Use a knife to cut food)	Yes (item C, 3: Eat with a knife and fork)	Yes (item 5: Use a knife to cut food)
Buttoning up clothes	19, %11.65	No	Yes (item C, 2: Button a shirt or blouse)	No
Knitting/lace/sew (handmade)	19, %11.65	Yes (item 17: Recreational activities which require little effort (e.g., cardplaying, knitting, etc.))	No	No
Opening a jar	18, %11.04	Yes (item 1: Open a tight or new jar)	Yes (item C, 1: Open a jar)	Yes (item 1: Open a tight or new jar)
Shopping	15, %9.2	Yes (item 10: Carry a shopping bag or briefcase)	No	Yes (item 3: Carry a shopping bag or briefcase)
Driving a car	7, %4.29	Yes (item 20: Manage transportation needs (getting from one place to another))	No	No
Turning a key	5, %3.06	Yes (item 3: Turn a key)	Yes (item A-B, 4: Turn a key in the lock)	No
Holding the bus	5, %3.06	Yes (item 20: Manage transportation needs (getting from one place to another))	No	No
Eating (using with a spon/fork/knife)	5, %3.06	No	Yes (item C, 3: Eat with a knife and fork)	No
Washing your hair	4, %2.45	Yes (item 13: Wash or blow dry your hair)	Yes (item C, 6: Wash your hair)	No
Washing dishes	4, %2.45	No	Yes (item C, 5: Wash dishes)	No
Tying shoelace	3, %1.84	No	Yes (item C, 7: Tie shoelaces or knots)	No
Making a bad	2, %1.22	Yes (item 9: Make a bad)	No	No
Garden or doing yard work	1, %0.66	Yes (item 8: Garden or do yard work)	No	No
Washing your back	1, %0.66	Yes (item 14: Wash your back)	No	Yes (item 4: Wash your back)
Putting on pullover sweater	0 ^a	Yes (item 15)	No	No
Changing a lightbulb overhead	0 ^a	Yes (item 12)	No	No
Recreational activities in which you take some force or impact through your arm, shoulder or hand (e.g., golf, hammering, tennis, etc.)	0 ^a	Yes (item: 18)	No	Yes (item 6)
Recreational activities in which you move your arm freely (e.g., playing frisbee, badminton, etc.)	0 ^a	Yes (item 19)	No	No
Sexual activities	0 ^a	Yes (item: 21)	No	No
Turning a door knob	0 ^a	No	Yes (item A-B, 1)	No
Pick up coin	0 ^a	No	Yes (item A-B, 2)	No
Holding a glass of water	0 ^a	No	Yes (item A-B, 3)	No
Holding a frying pan	0 ^a	No	Yes (item A-B, 5)	No
Carrying a grocery bag	0 ^a	No	Yes (item C, 4)	No
Pushing open a heavy door	0 ^a	Yes (item 5)	No	No

^a Activities not stated in COPM but recent in at least one of the questionnaires.

According to the comparison of COPM stated activities with the DASH-T items, 30.6% of COPM activities were found to have matched with DASH-T activities. These top three activities were “carrying a heavy object” (%39.2, n = 64), “doing heavy house chores” (%25.7, n = 42) and “writing” (15.9%, n = 26). The activities that were not stated in COPM but present in DASH-T were “sexual activities”, “recreational activities in which they take some force or impact through their arm, shoulder or hand (e.g., golf, hammering, tennis, etc.)”, “recreational activities in which they take some force or impact their arm, shoulder or hand”, “changing a lightbulb

overhead”, “pushing open a heavy door” and “putting on a pullover sweater”. On the other hand, the activities that were stated in COPM but were not present in DASH-T were “dressing” (12.88%, n = 21), “button up clothes” (11.65%, n = 19), “having a bath” (11.04%, n = 18), “using computer” (10.42%, n = 17), “squeezing hand cloth” (6.74%, n = 11), “opening a door” (6.74%, n = 11), “combing hair/tying hair” (6.13%, n = 10), “child care” (6.13%, n = 10) and “opening a bottle of water” (6.13%, n = 10).

When the COPM stated activities were compared to the 12 items of MHQ, 18.36% of COPM stated activities were found to have

Table 2
Activity categorization according to Occupational Therapy Practice Framework: Domain and Process 3rd Edition.

Occupational Therapy Practice Framework	Activities	n	Total	%	Total			
Activities of daily living								
Dressing	Putting On	25	54	15.33	33.2%			
	Button up clothes	19		11.65				
	Wearing brassiere	5		3.06				
	Tying soelace	3		1.84				
	Wearing socks	1		0.66				
	Wearing gloves	1		0.66				
Bathing, showering	Having a bath	18	27	11.04	16.6%			
	Washing hair	4		2.45				
	Washing face	4		2.45				
	Washing back	1		0.66				
Personal hygiene and grooming	Combing hair	10	20	6.13	12.31%			
	Making up/Shaving	6		3.68				
	Cutting your nail	3		1.84				
	Brushing teeth	1		0.66				
Feeding	Eating	5	5	3.06	3.06%			
Instrumental activities of daily living								
Home establishment and management	Cleaning the house	42	83	25.76	50.92%			
	Squeezing hand cloth	15		9.2				
	Clapping hand cloth	6		3.68				
	Hanging out the laundry	5		3.06				
	Ironing clothes	8		4.9				
	Wiping a table	2		1.22				
	Making a bed	2		1.22				
	Folding linen	2		1.22				
	Garden or do yardwork	1		0.66				
	Meal preparation and cleanup	Cooking		23		83	14.11	50.9%
		Opening a jar		18			11.04	
		Using knife		21			12.88	
		Making a pot of tea		8			4.9	
Kneading dough		6	3.68					
Washing dishes		4	2.45					
Planning		3	1.84					
Communication management	Using computer	17	19	10.42	11.64%			
	Communication	2		1.22				
Shopping	Shopping	15	15	9.2	9.2%			
Child Rearing	Child care	10	10	6.13	6.13%			
Driving and community mobility	Driving a car	7	15	4.29	9.19%			
	Riding a bike	3		1.84				
	Holding the bus	5		3.06				
Other	Turning a key	5	64	3.06	39.26%			
	Turning on/off a tap	4		2.45				
	Using umbrella	1		0.66				
	Opening a bottle	10		6.13				
	Opening a door	11		6.74				
	Overhead activities	26		15.95				
	Carrying a heavy object	64		39.26				
	Education							
Formal educational participation	Writing	26	26	15.95	15.95%			
Leisure								
	Using scissors	2	2	1.22				
	Knitting/Lace/Sew	19	19	11.65				
	Reading a newspaper	2	2	1.22				

matched with MHQ items. The top three of these activities were “eating with a knife and fork” (12.8%, n = 21), “buttoning a shirt or blouse” (11.6%, n = 19) and “opening a jar” (11%, n = 18). The activities which were not stated in COPM, yet were present in MHQ were “picking up a coin”, “holding a glass of water” and “holding a frying pan”. Additionally, the top three activities which were stated in COPM, but were not present in MHQ were “carrying a heavy object” (39.2%, n = 64), “cleaning the house” (25.7%, n = 42), and “writing” (15.9%, n = 26) (see Table 1).

Once the COPM stated activities were compared to the 6 items of QuickDASH, 10.2% of COPM stated activities were found to have matched with QuickDASH items. The top three of these activities were “carrying a shopping bag or a briefcase” (n = 15, 9.2%), “doing heavy household chores” (e.g., washing walls, washing floors) (25.7%, n = 42) and “using a knife” (12.8%, n = 21). The only item which was not stated in COPM in QuickDASH questionnaire was

“recreational activities in which they take some force or impact through their arm, shoulder or hand (e.g., golf, hammering, tennis, etc.)”. On the other hand, the top three activities stated in COPM but not present in QuickDASH were “carrying a heavy object” (39.2%, n = 64), “writing” (15.9%, n = 26) and “overhead activities” (15.9%, n = 26).

Discussion

In response to our research questions, the result of the present study demonstrate that the problematic activities in Turkish culture with hand injuries are mostly the instrumental daily living activities like “carrying a heavy object” and “cleaning the house”. None of the three questionnaires, namely DASH-T, MHQ and QuickDASH have satisfactory results for reflecting the problematic activities among hand injured Turkish people. DASH reflects 30% of the

problematic activities, whereas MHQ and QuickDASH reflect 16.32% and 10.2% of the problematic activities of hand injured Turkish people respectively.

In this study, the most remarkable daily activity that was mentioned by the participants was the “dressing” activity, which was questioned in none of three questionnaires. This is an important finding of the present study. On the other hand, none of three questionnaires has any items that investigate all the aspects of daily living activities of dressing, bathing, self-care, transportation, and eating. Despite the fact that those questionnaires investigate the activities such as “using a knife to cut food”, “washing their back”, and “buttoning a shirt or blouse”, those activities are so specific sub-activities. Merely investigating the sub-activities is one of the big limitations of the above-mentioned questionnaires. Nevertheless, being unable to do the sub-activity does not mean that one is unable to do the whole activity. To exemplify, if one cannot use a knife to cut food, this does not mean that she/he is unable to eat, she/he can use her/his hands to eat.

Moreover, seventeen participants in the study mentioned that they had problems with using computers but none of the questionnaires investigate technologic activities like using a computer or a telephone. Thus, this is another big disadvantage of the three questionnaires since the ability to use technology has become an increasingly important part of daily life. In the literature, there are some activities of daily living questionnaires developed to assess the ability to use technology specifically. Because of the fact that technology has infiltrated every aspect of our lives, it is obvious that these three scales have to be updated for technological modern life.¹⁵

Participants, in addition, rated more problems in instrumental daily living activities than daily living activities. The most four rated activities are “carrying a heavy object”, “cleaning the house”, “overhead activities” and “writing” respectively. While all 4 most rated activities were questioned in DASH and one of them -cleaning the house-was questioned in QuickDASH, none of them were questioned in MHQ. It can be inferred that although DASH questionnaire does not have satisfactory results for reflecting the problematic activities of participants and did not question the most problematic daily living activities, it can still reflect the three most rated problematic activities in Turkish culture. It has also been shown in the studies that DASH is a reliable measure to capture activity limitation and participation restriction in upper extremity function on an individual basis and specific to diagnosis.^{1,16–19} Drummond and Dixon also mentioned in their study that DASH does link well with the ICF framework by reflecting nineteen pure activity limitation items and three participation restriction items.^{20,21}

Besides having good clinimetric results, the most useful questionnaire has to help identify the clinical conditions of the patient. Most of the existing questionnaires such as DASH and MHQ were originally constructed from a large pool of questions developed from existing scales. To construct a questionnaire in this way does not ensure that this pool of problematic activities will cover the activities for all the cultures. Hence, in the other cultures in which they would like to use the questionnaire, they should initially perform cultural adaptation and validity studies in order to reach equivalence between the original source and target languages. As Beaton mentions: “For the measures to be used across cultures, the items must not only be translated well linguistically, but also be adapted culturally in order to maintain the content validity of the instrument across different cultures”.^{19,22} However, within this adaptation process one is not allowed to change some activities that do not fit in her/his culture or add some activities that are really important to her/his culture. By using this adapted version of the questionnaire, one assesses the activity limitation of her/his

patient according to the problematic activities that are described for another culture.

In the previous study conducted by the researchers of this study, the cultural adaptation and validation of DASH and MHQ questionnaires into Turkish culture were studied. For DASH questionnaire, some slight changes for the activities were made in order to adapt those activities into Turkish culture: e.g. some examples were provided with infrequently performed activities in Turkey for the seventh, eighth, eighteenth and nineteenth items regarding the recreational activities.^{10,11,14} Despite this adaptation procedure, the present study showed that DASH questionnaire only reflects 30% of the problematic activities. Our results are contradictory with the literature. Smith, nevertheless, concluded in his study that there is a correlation between DASH and COPM results, which means that they these two questionnaires are able to identify the common abilities.²³ Furthermore, DASH-DLV was found to be satisfactory in terms of reflecting the problematic activities among Dutch patients with upper extremity injuries (see the Dutch version of DASH). This contradictory result can be attributed to many factors. First and foremost, the cultural context of Turkey is totally different than the western countries because of the regional and religion differences which directly affect the activity profile. Another factor might be the fact that DASH is an upper extremity disability questionnaire which is designed specifically for the assessment of disability in the upper extremity. This means that DASH questionnaire also investigates some shoulder specific activities such as “pushing open a heavy door” and “changing a light bulb”. Nevertheless, because the population in the present study involves hand injured people, reported problematic activities are therefore hand specific activities like fine dexterity. The third factor, on the other hand, is the fact that the participants in the present study described activities such as “squeezing a hand cloth”, which are highly culture specific. Although in the adaptation process the examples were adapted by changing the original one with the one having more cultural matching, it is obvious that those sample activities are not one of the problematic activities described by the population in the present study.

Throughout the adaptation process, forward and back translation of the MHQ questionnaire revealed no major problems or language difficulties. Because MHQ is a hand specific outcome measure, it only reflected the 16.32% of problematic activities. The most rated activity that corresponds with our COPM results and MHQ is “using a knife”, which is one of the two activities questioned in all three scales. The other common activity questioned in all of the three scales is “opening a jar”. MHQ is indeed a hand specific outcome measure that can measure function and symptoms separately for each hand and most of the activities questioned in MHQ are unimanual activities. But in the present study, the activities reported as problematic are mostly bimanual activities could be the cause of insufficient reflection.

In the literature, although the response rate for the QuickDASH has been reported as higher than for the full DASH and perfect correlation between QuickDASH and DASH scores, QuickDASH is the least satisfactory scale with a proportion of 10.2%. In fact, it has only one common activity-cleaning the house-with our COPM results. The reason behind this is probably the fact that QuickDASH is formed from the items of the DASH through item reduction methodology.^{24,25}

By using the existing outcome measures, the aim of the clinicians is to identify the problematic activities of people. By identifying the problematic activities, which are specific to the person, clinicians can clarify the activity limitation that can influence a one's health and illness experience, thereby leading to establishing an individualized treatment programs for each person. In the present study, there are numerous activities reported in COPM that are

mainly specific to Turkish culture, e.g. “squeezing a hand cloth”, “making a pot of tea”, “clapping hand cloth”, and so forth. These reported activities carry a great deal of importance, especially for women, yet none of the three-outcome scales have items that investigate these kinds of cultural activities. On the other hand, it is clear that by using the same valid scales throughout the world, we found a chance to compare the disability scores of the common problems across cultures by documenting the results of our interventions and organizing research information.²⁶

We believe that it will be really difficult to construct a questionnaire which involves all the cultural activities in it. To overcome this problem, our suggestion for hand injured Turkish patients is parallel to literature. Besides using the standardized questionnaires, open ended interviews like COPM should be the irrevocable part of the assessment process in order to describe a person-center treatment program. The use of the COPM with hand therapy has been well documented in the literature. It is also stated in the literature that change scores on the COPM correlated with outcome and change scores of the DASH.²³

The present study has also some limitations that require consideration. For instance, the involvement of the dominant limb as the injured limb, gender and diagnoses might have affected the COPM results. However, the small sample size did not allow analysis of the data according to gender and diagnoses. Although those factors can affect the activity profile, the aim was to investigate the problematic activities of the hand injured people. On the other hand, the involvement of the dominant limb was reported to have a small effect on the upper extremity-specific disability.²⁷ Further studies can be conducted in order to see the effect of sex and dominance on the activity profile of hand injuries.

It is difficult to choose adequate outcome measures for health care professionals to document the results of their interventions and organizing research information because of the increasing number of instruments developed in recent decades. Once clinicians try to choose the best fit outcome measure for their patients, they should also keep in their minds that the cultural context influences the person's activity choices, which directly will have an effect on the intervention results.

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