Occupational Therapist Intervention for Phantom Pain in People Who Have Lost a Limb Due to Military Actions

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INTRODUCTION Phantom pain and sensation are among the most common sequelae of limb amputation, occurring in 50–85% of people [1]. Phantom sensations are defined as non-painful sensory experiences of the missing limb, whereas pain is manifested by painful sensations in its projection [2].

In a Brazilian hospital study, lower limb amputation patients with phantom pain and sensation reported lower scores on the physical component of quality of life—that is, difficulties with mobility, functioning, and performing daily activities [3]. Systematic reviews of the literature confirm that the prevalence of phantom sensations is 76–87% [4]. They manifest as sensations of touch, tingling, movement, temperature, or position of the limb, and affect well-being and participation in activities [4].

The pathophysiology of phantom limb pain is multifactorial and involves peripheral, spinal, and cortical mechanisms [5]. Studies have shown a relationship between stump pain and phantom pain, in which peripheral nociceptive stimuli can worsen phantom limb pain through mechanisms of peripheral and central sensitization [6,7].

As information on the phantom pain and phantom sensation, and the occupational therapist interventions for both in those wounded in war is limited, we aimed to expand the knowledge on the phenomenon by evaluating patient experiences and occupational therapy interventions.

METHODS & RESULTS *Sample*. 15 adult (>18 y.o.) male patients, both civilians and military, injured as a result of the war in Ukraine were included in the study. At the time of the study, all patients had at least one limb amputation and were receiving prosthetics and rehabilitation at the Superhumans Center in Lviv, Ukraine.

KEYWORDS *phantom pain, phantom sensation, stump pain, TENS, mirror therapy, sensory stimulation*

Data were collected as a part of the patient's rehabilitation journey via a patient record management system (Eleks) and anonymized data were analyzed in MS Excel.

Total number of patients reviewed	15
Group	
Military	14
Civilian	1
Age, years	
MEDIAN age	32.0
MEAN age	37.4
STD age	15.1
MAX age	67
MIN age	19
Number of patients by number of amputated limbs	
one amputated limb	4
two amputated limbs	10
three amputated limbs	1

Table 1. General sample information

Data collection. Phantom limb data were collected via a verbal survey, focusing on the impact of the pain on the patient's well-being:

- Pain intensity was quantified using the Visual Analog Scale (VAS).
- Pain frequency was categorized on a four-point ordinal scale (always, often, periodically, or never).
- Participants were also assessed on the temporal context of their symptoms, specifically distinguishing between pain at rest versus pain during activity, as well as noting unprovoked (spontaneous) onset.

Factors that increase/stimulate PLP	# of patients
at rest (without active movement, when sitting)	5
on a permanent basis	7
after physical exertion	2
before going to bed (in the evening)	6
on a change in weather	4
no triggering factor duration up to 10 sec max	1
VAS	**mean VAS values**
at assessment	5,67
at the time of intervention	5,13
after intervention	3,67
Pain frequency	
always	7
often	4
periodically	3
never	1

Table 2. Data collection

Qualitative characteristics of the phantom pain were documented using standard descriptors, including burning, freezing, shooting, squeezing, throbbing, heaviness, or numbness. General qualitative data was also obtained via subjective patient experience reports.

Characteristic of phantom pain sensation	# of patients
aching	5
throbbing	1
shooting	4
sharp	2
numbness	2
tingling	2
tingles	1
heaviness	4
current	2
tightness	1
stinging	1
cutting	1
numbness	2
burning	3

Table 3. Qualitative characteristics of phantom pain

Factors that could potentially affect phantom pain were recorded.

Accompanying circumstances	
fresh scar	1
neuroma	2
compression pain	8
swelling	11
contracture	6
shrapnel contamination	4
pain when pressure is applied	8
hyperpigmentation	0
unhealed wound	13
internal sutures	10
stump not formed yet	15

Table 4. Factors potentially affecting phantom limb pain

Phantom sensation was assessed via a verbal survey. We found that all of the 15 patients experienced a phantom limb sensation though its presentation differed from case to case. The majority of the patients could not move the phantom and described its position as being similar to the position of the extremity immediately before the amputation. While for 12 out of 15 patients the sensation was constant, 2 patients associated the phantom sensation with phantom pain.

Phantom sensation	
yes	15
Factors contributing to the appearance	
constant	12
when thinking	1
phantom pain	2
Can move the phantom limb	
yes	4
no	11
Does it cause discomfort	
yes	6
no	6
no answer	3

Table 8. Phantom sensation

The effect of an occupational therapist-provided intervention on phantom pain was assessed by comparing pain intensity before and after the intervention; pain intensity was measured using the Visual Analog Scale (VAS). A paired-samples t-test was employed to compare mean VAS scores before and after the intervention to determine statistical significance.

At the initial assessment, participants reported a mean VAS score of 5.67, followed by a significant reduction to 3.67 upon the intervention. ($p < 0.005$).

Timing of VAS (n = 15)	mean VAS values
at assessment	5.67
at the time of intervention	5.13
after intervention	3.67

Table 6. Mean VAS scores before, during, and after intervention

DISCUSSION When it comes to therapy, there is no conclusive evidence for or against any one method. There are over 60 different methods described in the literature that can reduce pain, but we do not know which ones work best for a particular person. There is a strong placebo effect everywhere [8]. Modern strategies for treating phantom pain are based on a multidisciplinary approach.

Since the phenomenon of phantom pain and sensation is still not fully understood by science and specialists, it can be assumed that the characteristics of traumatic exposure during military operations, as well as associated psychoemotional factors, can modify the course of the pain syndrome and the response to treatment, which, in turn, requires further research.

Our results also require further research due to the small number of observations.

CONCLUSION Occupational therapist intervention is an important stage in the rehabilitation of individuals who have lost a limb due to military operations, in particular to reduce phantom pain. The use of the above methods allows to significantly improve the adaptation of the brain to the loss of a body part and reduce pain. Comprehensive rehabilitation consists of a combination of physical and psychological methods, which contributes to improving the quality of life of victims and their return to active life.

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