SUITABILITY OF THE "QUALITOUCH ACTIVITYINDEX" AS A QUALITY CONTROL TOOL TO MONITOR PHYSIO- AND EXERCISE THERAPY

ПРИДАТНІСТЬ «QUALITOUCH ACTIVITYINDEX» ЯК ІНСТРУМЕНТУ КОНТРОЛЮ ЯКОСТІ ДЛЯ МОНІТОРИНГУ ФІЗИЧНОЇ ТЕРАПІЇ

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Abstracts

Background. From the patient's perspective, achievement of expected therapy goals and satisfaction with the treatment are important parameters to evaluate the quality of the therapeutic pathway. The "QUALITOUCH Activityindex" (AI) was developed due to the lack of an instrument that measures both aspects at the same time. In addition to the achievement of therapy goals and satisfaction with therapy, the "AI" measures also the degree of pain/discomfort and the subjective activity limitation in everyday life and leisure activities.

Objectives. The aim of this study was to compare the results obtained by the "AI" with those obtained by the European Quality of Life Questionnaire (EQ-5D-3L) in patients suffering from musculoskeletal diseases.

Method. From a total of 57 participants anonymized data sets were evaluated retrospectively. Through the treatment-accompanying data collection, the "AI" was collected digitally before the first therapy session. The "EQ-5D-3L" data was gathered digitally within the next 24 hours. Data analyses was conducted using Spearman rank order correlation coefficients (rho), Cohen's kappa parallel reliability (convergent validity) and Cronbach alpha (internal consistency).

Results. Strong and statistically significant correlations were found for the items "Occupational Activity" (AI) and "General Activities" (EQ-5D-3L) as well as "Healthstatus" of both questionnaires (rho = 0.59 and rho = 0.64; both $p < .001$). Parallel reliability showed medium agreements for "pain" ($\kappa = 0.44$), "work" ($\kappa = 0.48$) and "health status" ($\kappa = 0.64$). The internal consistency was acceptable (Cronbach alpha = 0.73).

Conclusions. The "AI" seems to have the potential to be used as an easy-to-use instrument for the assessment of activity limitations in everyday life, leisure and work in patient's suffering from musculoskeletal diseases. Due to the slightly differing items, response dimensions and the fact that the data were not collected at the exact same time point, moderate correlation values can be explained.

Key words: patient reported outcome measures, quality management, health care outcomes, musculoskeletal disorders, physical therapy.

Вступ. З точки зору пацієнта досягнення очікуваних цілей терапії та задоволеність лікуванням є важливими параметрами для оцінки якості терапевтичного шляху. «QUALITOUCH Activityindex» (AI) був розроблений через відсутність інструменту, який вимірював би обидва аспекти одночасно. На додаток до досягнення цілей терапії та задоволеності терапією «AI» також вимірює ступінь болю/дискомфорту та суб'єктивне обмеження активності в повсякденному житті та дозвіллі.

Метою цього дослідження було порівняння результатів, отриманих за допомогою «AI», з результатами, отриманими за допомогою Європейського опитувальника якості життя (EQ-5D-3L) у пацієнтів із захворюваннями опорно-рухового апарату.

Метод: із загалом 57 учасників анонімні набори даних були оцінені ретроспективно. Завдяки збору даних, що супроводжують лікування, «AI» збирали в цифровому вигляді перед першим

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сеансом терапії. Дані «EQ-5D-3L» були зібрані в цифровому вигляді протягом наступних 24 годин. Аналіз даних проводився з використанням коефіцієнтів рангової кореляції Спірмена (rho), паралельної надійності каппа Коена (конвергентна валідність) і альфа Кронбаха (внутрішня узгодженість).

Результати. Були виявлені сильні та статистично значущі кореляції для пунктів «Професійна діяльність» (AI) і «Загальна діяльність» (EQ-5D-3L), а також «Стан здоров'я» обох опитувальників (rho = 0,59 і rho = 0,64; обидва $p < 0,001$). Паралельна надійність показала середню згоду для «болю» (**к** = 0,44), «роботи» (**к** = 0,48) і «стану здоров'я» (**к** = 0,64). Внутрішня консистенція була прийнятною (альфа Кронбаха = 0,73).

Висновки. «AI», схоже, має потенціал для використання як простого у використанні інструменту для оцінки обмежень активності в повсякденному житті, дозвіллі та роботі у пацієнтів із захворюваннями опорно-рухового апарату. Через дещо відмінні елементи, відповіді та той факт, що дані не були зібрані в той самий момент часу, можна пояснити помірні значення кореляції.

Ключові слова: показники результатів, які повідомляють пацієнти, якість менеджменту, результати охорони здоров'я, порушення опорно-рухового апарату, фізична терапія.

Introduction. The evaluation of therapy success and patient's satisfaction is increasingly becoming a requirement for the ambulant sector in physiotherapy, especially in Switzerland. This is becoming evident in current discussions about increasing legal requirements for quality management in physiotherapy. The necessity for health service providers to implement quality management instruments has been defined in Swiss legislation since the beginning of 2022 (KVV Art. 77).

Quality management should be based on the "International Classification of Functioning, Disability and Health" (ICF). This describes and classifies a person's functional ability has been defined in Swiss legislation since the beginning of 2022. The health status is classified based on the assessment of "body functions and body structures", "activities and social participation" as well as the "contextual factors" ("environmental factors" and "person-related factors") (Deutsches Institut für Medizinische Dokumentation und Information (DIMDI) [7]. This results in a holistic bio-psycho-social perspective of the human being and includes the complex interrelationship of health and illness in the respective environment.

The assessment of the extent to which a health disorder limits or does not limit participation at the activity and participation level can only be made by the patient him/herself [25]. Patient-reported outcomes (PROs) are used to assess health status. These measures are known as patient-reported subjective outcome measures (PROMs). The use of PROMs is especially important in the context of patient-centered healthcare, because the patient knows best him-/herself, his/her body and his/her "preferences and expectations" and can thus provide important additional information about the effects of therapy that addresses their health condition [15].

This subjective assessment is an important quality indicator in medical care. Various measurement and evaluation instruments (so-called "assessments") are used in physiotherapy. A distinction is made between subjective and objective instruments. Objective outcome variables result from the measurement of physical parameters, such as blood pressure, body height or joint mobility and muscle strength, while subjective outcome variables result from the assessment of either the examiner or patient. Examples for such assessments are the recording of pain intensity [15] or the use of the "European Quality of Life" ("EQ-5D-3L") that is used to assess quality of life [11].

In 2008, Weinhold noted that the introduction of compulsory documentation in physiotherapy is not easy. Reasons such as: "...a lack of orientation, but also an unwillingness to deal with documentation and reporting...", "...standards for assessing success are lacking..." are mentioned [25]. Also, differences in professional terminology used in documentations among physical therapists are mentioned in this study. In addition, many physiotherapists still frequently assess body structure and pathological conditions, but rarely address activity limitations or disabilities in everyday life or work of their patients [25].

More recently, Braun et al. [2] analyzed the extent to which the use of measuring instruments

for surveying various aspects of quality of life is used in physiotherapy in Germany and which facilitators and barriers exist concerning their use. They showed that about 86% of the physiotherapists interviewed would use measuring instruments. 75% of the participants were convinced of the clinical benefits and that they have the potential to improve quality of care. A lack of regular use of measuring instruments was indicated by 22%. The increased time expenditure was indicated as a barrier by 50%, as well as a lack of financial compensation for quality control tasks.

Lack of time and impractical solutions for documentation were also a result of a Delphi survey by Griefahn et al. [10]. They concluded that electronic documentation software could improve the lack of documentation and enhances compliance with the legal framework. About 80.7% of the surveyed physiotherapists from Austria use assessments and measuring instruments at the initial treatment session [14] while 14.2% reported to administer some form of assessment in every therapy session.

These aspects indicate a development towards more frequent dissemination of the use of assessments in daily practice in physiotherapy. It seems to be reasonable to extrapolate the data from Germany and Austria to the whole DACH – region (German speaking regions of Germany, Austria, Switzerland).

PROMS/assessments are recommended in the literature [1; 26] because they determine the current status, support the clinical decision-making process and record the process or success of therapy [15].

In sports and exercise, sport-specific and injury-specific assessments are used to define, control and monitor training, to improve the athletic performance of each individual and to prevent injuries [16]. Mobility, balance, strength, endurance, cardiac fitness and quality of life can for example be assessed. If the overall condition of these patients and the limitations they experience are to be assessed, several different questionnaires might be necessary, which is a clear downside of these assessments or specific PROMS.

In Switzerland, more than 1 million people suffered from an accident in 2022 and causing material costs of 12 billion Swiss francs [17]. After a sports accident and accompanying complaints, impairments of e.g. musculoskeletal function in daily life, occupational activities, quality of sleep, and the general health status are present for a certain period. Monitoring the success of therapy and satisfaction with the therapy from the patient's point of view is crucial to document the therapy process in relevant dimensions of daily life. This is where the "QUALITOUCH Activityindex" (AI) as a generic PROM might help as a tool for therapy monitoring.

The "QUALITOUCH Activityindex" (AI) was created as a generic "PROM" for the assessment of pain and discomfort and their influence on sleep quality, daily, leisure and leisure activities and general health [24] his so-called "QUALITOUCH Activityindex" (AI), which consists of eight questions that are considered individually without the need to calculate a total score, measures the success of the therapy (quality of results) and patient satisfaction. By assessing the success of the therapy (quality of results) and patient satisfaction, the "AI" aims to fulfill the quality assurance requirements of the federal government.

There is currently no standardized assessment for the latter. With the "AI", it would be possible to use just one assessment instead of several.

The "AI" has already been used in various studies [13; 18; 20] and compared with the "Short-Form-Health Survey" (SF-12, examination instrument for recording health-related quality of life) in patients with back pain [21]. These studies showed, with medium to high correlations, that similar dimensions are recorded with the "AI" and interpret this as "indirect validation" of the "AI".

In the sense of an extended validation, the aim of this study was to compare individual items of the "QUALITOUCH Activityindex" (AI) with corresponding items of the "EQ-5D-3L" in a heterogeneous cohort of persons with musculoskeletal complaints. The question was whether the "QUALITOUCH Activityindex" can similarly depict/record quality of life and

the restrictions and functional impairments in individuals with musculoskeletal complaints from the German-speaking countries comparable to the application of the "EQ-5D-3L".

Method. This study was conducted according to the COSMIN guidelines [9] (see Appendix). COSMIN is considered to be an appropriate guideline for reporting results on the assessment of "PROMs" in order to transparently present study objectives, methods (including statistical analysis), presentation of results and discussion.

An overview of the study workflow is shown in Figure 1.

A comparison of similar items of the "AI" with corresponding items of the "EQ-5D-3L" is conducted and thus a construct validation is done.

In- and Exclusion criteria

Inclusion criteria of included patient data were age over 16 years, knowledge of the German language and written informed consent to participate in the study. Participants with musculoskeletal complaints were included. A specific diagnosis or patient group was not required, as the "AI" is designed to be used broadly and is pathology-independent ("generic" PROM).

Ethics approval

Anonymized data from a quality control data set were used for data analysis, so no approval from the ethics committee was required, according to the Swiss Human Research Act (HFG (Art. 2 para. 2 lit c)) (Bundesversammlung der Schweizerischen Eidgenossenschaft) [3].

Measuring instrument EQ-5D-3L

The "European Quality of Life Qol-5D-3L" ("EQ-5D-3L") questionnaire is used in Europe to measure quality of life. This instrument consists of two components (1. the EQ-5D description system and 2. the visual analogue EQ scale (EQ VAS)). The first component comprises five dimensions (mobility, self-care, usual activities, pain/discomfort and anxiety/depression) [11; 19]. Each dimension has three response options (no, some or extreme problems). Participants tick the answer for each dimension that is the most similar to their state of health. Each answer is assigned a one-digit number (1–3). All answer scores are written one after the other as a number

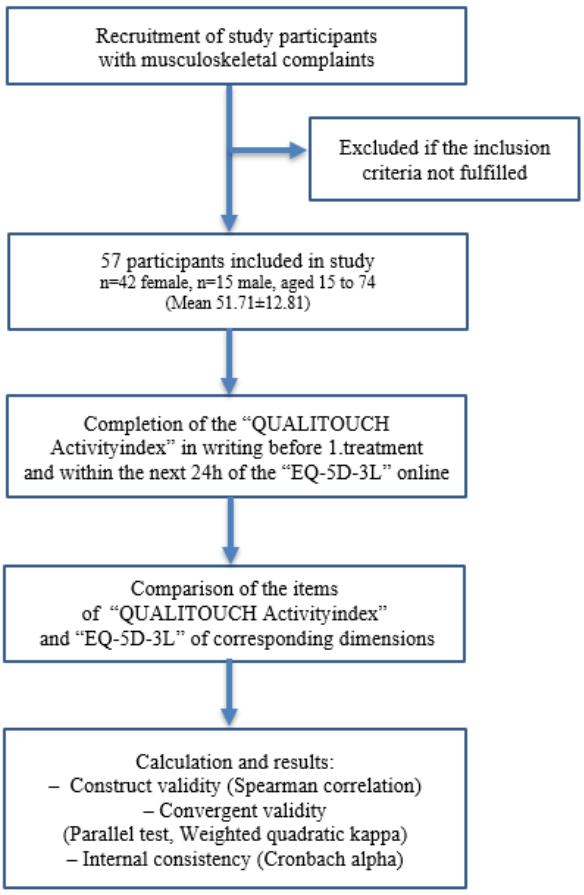

Fig. 1. Study flowchart with patient pathway and chronological sequence of data collection

line. With five dimensions, this results in a total five-digit number documenting the respective state of health.

In the second part, the "EQ VAS" as an assessment of the state of health is determined on a visual analogue scale. This scale ranges from 0-100, with 0 as the "worst imaginable state of health" and 100 as the "best imaginable state of health". The "EQ VAS" is used as an objective measure of health status from the patient's perspective.

New measuring instrument "QUALITOUCH Activityindex" (AI)

The aim of using the "AI" is to assess pain and complaints as well as their impairment in household activities, leisure activities and work activities, i.e. also restrictions on participation. In addition, patient satisfaction with the therapies carried out, the achievement of therapy goals and the assessment of the general state of health of the

patient is documented. This assessment can be used in the context of the legally required quality measurement in Swiss ambulant physiotherapy practice.

The data collection of the "AI" was performed in a simple, straight forward approach for the patients without great time effort and independent of the body regions or the underlying medical condition.

The generic "PROM" "QUALITOUCH Activityindex" (AI) consists of nine questions covering different dimensions and the quality measurement:

1. How strong were your maximum pain or complaints over the past 24 hours? (VAS 0–10)
2. How strong were your average pain levels or complaints over the past 24 hours? (VAS 0–10)
3. How strongly did pain or complaints affect your quality of sleep?
4. How strongly did pain or complaints affect your household activities?
5. How strongly did pain or complaints affect your leisure activities?
6. How strongly did pain or complaints affect your work activities?
7. Please rate your state of health in general?
8. How well did you achieve the therapy goal
9. Are you satisfied with the therapy you have received?

The answers are measured on a Likert scale (ordinally scaled). Questions one and two on pain/discomfort are asked on a scale of 0–10, (NRS – Numeric Rating Scale: zero (0) is no pain, ten (10) is severe pain). The answer options for questions three to six are on a Likert scale (5-points): not at all, slightly, moderate, strong or extreme. For question six about work activities, the answer option: "I do not work" is additionally added. Question seven – the answer about the state of health, a distinction can be made between: bad, moderate, good, very good (also 5-point). Question eight and nine can be answered (4-point) with: full satisfaction, moderate satisfaction, little satisfaction or not satisfied.

Study procedure and data collection

Subjects were recruited in a private physiotherapeutic practice. For anonymization purposes, the participants received an automated personal ID after giving verbal and written consent to participate in the quality control study. All study participants were given the "AI" in written form to complete independently in the physiotherapy practice before the start of the initial treatment. Within the next 24 hours after the initial survey, they also received an electronic link to complete the "EQ-5D-3L". These two surveys of the "AI" and the "EQ-5D-3L" were used for the subsequent comparisons of the two instruments and were considered to be rated at the same point in time within the therapy process. After an initial physiotherapeutic treatment, in which a first assessment, anamnesis and therapy planning occurs, no significant change in the quality of life and the other outlined dimensions have been assumed in a period of 24h until execution of the "EQ-5D-3L".

Statistics

The data set is a univariate, dependent sample. All items of the "AI" were compared – when congruent with the corresponding items of the "EQ-5D-3L". Not all items cover directly comparable dimensions. Then the data was compared to see which items have the same statement or a similarity in statement.

The "AI" consists of five answer options, the "EQ-5D-3L" of three. To make them comparable, the response levels of the "AI" were summarized as follows: For the response "pain", from 0 was replaced with 1, 2 to 7 with 2 and 10 with 3. For the items "quality of sleep", "household activities", "leisure activities" and "work activities", the level 0 was changed to 1, 25 to 75 to 2 and 100 to 3. The item "general health" was changed from 0 to 5, 25 to 4, 50 to 3, 75 to 2 and 100 to 1.

To assess construct validity, a correlation of the individual items was performed. Since the data were ordinally scaled (Likert scale), the Spearman correlation ("rho") was calculated to analyze possible correlations. The following effect sizes are specified for the correlation: rho around 0.10 (weak effect), rho around 0.30 (medium effect) and rho around 0.50 or higher (strong effect) [4; 5]. The significance level was set a priori at 5%.

To calculate the convergent validity, the parallel test [22] is performed and reported in the weighted quadratic kappa value (Cohen) [23]. The kappa cut-off values (**κ**) are determined according to Fleiss et al. [8] with <0.40 as low, 0.40 to <0.75 as medium to good and above 0.75 as excellent.

The Cronbach alpha is calculated for the internal consistency of the "AI". A value of 0.70 to 0.90 is considered well accepted [6].

The dependent variable Y is the single item of the "new" test "AI" and the independent variable X is the content-corresponding item of the "EQ-5D-3L".

Drop-out or missing values were treated as missing values.

The SPSS software, version 27.0.0.0 was used for statistical analysis [12].

Hypotheses

It is assumed that the comparable items of the two instruments are highly correlated and thus lead to similar conclusions. Therefore, the current functional limitations and impairments due to musculoskeletal complaints should be adequately depicted with the "AI". The assumptions are therefore:

1. Construct validity: The items of the "QUALITOUCH Activityindex" correlate with the corresponding items of the "EQ-5D-3L" rho ≥0.50.

2. Convergent validity: In the parallel test and the weighted quadratic kappa, good kappa values (**κ**) with **κ** ≥ 0.40 are achieved.

3. The internal consistency reaches values $\alpha > 0.7$ for the "AI".

Results

Study participants

Anonymized data from 57 participants (42 female, 15 male) aged 15 to 74 years (Mean 51.71 ± 12.81) were analyzed. Of these, the data for age, diagnosis, gender and the results of the questionnaires "AI" and "EQ-5D-3L" were available.

Diagnoses

Participants had musculoskeletal complaints at all regions of the body: lower extremity (hallux valgus, metatarsalgia, buckling foot, achillodynia, patellar instability, meniscus lesion, knee joint arthrosis, trochanteric pain, etc.), trunk (ISG complaints, acute herniated disc, facet joint syndrome, spondylarthritis, etc.), upper extremity (scapula alata, shoulder dislocation, shoulder impingement, tennis/golf elbow, carpal tunnel syndrome, wrist joint arthrosis, wrist joint pain, etc.). a.) and neck/head (migraine, bruxism, tension headache, cervical spine arthrosis a. o.).

Construct validity

Table 1 shows the Spearman correlation between the items of the "QUALITOUCH Activityindex" (AI) and the "EQ-5D-3L". The highest correlation value (rho = -0.64) was found between the item "General health" of the "AI" and the item "Health status" of the "EQ-5D-3L".

Convergent validity

Parallel reliability

The results of the parallel reliability analysis between the items of the "QUALITOUCH Activityindex" and those of the "EQ-5D-3L" are shown in Table 2. Nine values are higher than Kappa 0.40. The highest value (**κ** = 0.64) was found between the item "General health" of the "QUALITOUCH Activityindex" and the item "Health status" of the "EQ-5D-3L" questionnaire.

Weighted quadratic kappa

Table 3 shows that six values from the matrix had a Weighted quadratic kappa value higher than 0.40. The highest value (**κ** = 0.62) was observed between the item "General Health" of the "QUALITOUCH Activityindex" and "Health Status" of the "EQ-5D-3L" questionnaire.

Internal consistency

Cronbach alpha

Table 4 shows the results of the internal consistency calculation. Cronbach's alpha was 0.73 for seven items of the "QUALITOUCH Activityindex" (without "therapy goal" and "satisfaction").

Discussion. The aim of this study was to investigate the relationship between the individual items of the "QUALITOUCH Activityindex" (AI) and the corresponding items of the "EQ-5D-3L". The results showed that the "AI" has the potential to be used as an easy-to-use PROM to assess the status of the patient's activity limitation in household activities, leisure activities and work activities.

Table 1

Construct validity (Spearman correlation) of the "EQ-5D-3L" items with the items of the "QUALITOUCH Activityindex" (AI)

			QUALITOUCH Activityindex						
			Maximum pain	**Average pain**	**Sleeping Quality**	**Household activities**	**Leisure activities**	**Work activities**	**General state of health**
EQ-5D-3L	**Mobility**	rho sig. N	.45** .000 57	.23 .083 57	.11 .425 57	.35** .007 57	.11 .423 57	.38** .008 48	-.30 .025 57
	Self-care	rho sig. N	-.12 .395 57	.07 .632 57	-.05 .694 57	.38** .003 57	.24 .073 57	.19 .187 48	-.40** .002 57
	Usual activities	rho sig. N	.44** .001 57	.21 .122 57	.22 .099 57	.35** .007 57	.31* .019 57	.59** .000 48	-.44** .001 57
	Pain/ discomfort	rho sig. N	.42** .001 57	.34** .009 57	.45** .000 57	.41** .002 57	.24 .076 57	.44** .002 48	-.30* .025 57
	Anxiety/ depression	rho sig. N	.07 .606 57	.17 .197 57	.12 .378 57	.07 .612 57	.05 .535 57	.19 .207 48	-.18 .189 57
	Health state	rho sig. N	-.37** .005 56	-.19 .160 56	-.28* .036 56	-.41** .002 56	-.32* .015 56	-.50** .000 47	-.64** .000 56

**– The correlation is significant at the 0.01 level (two-sided).

*– The correlation is significant at the 0.05 level (two-sided).

Table 2

Convergent validity (Parallel reliability) between the items of the "QUALITOUCH Activityindex" and the "EQ-5D-3L"

		QUALITOUCH Activityindex						
		Maximum pain	**Average pain**	**Sleeping Quality**	**Household activities**	**Leisure activities**	**Work activities**	**General state of health**
EQ-5D-3L	**Mobility**	0.45	0.17	0.1	0.33	0.1	0.31	0.21
	Self-care	0.08	0.06	0.04	0.36	0.24	0.17	0.21
	Usual activities	0.45	0.14	0.18	0.31	0.26	0.48	0.37
	Pain/ discomfort	0.44	0.26	0.43	0.38	0.22	0.38	0.22
	Anxiety/ depression	0.08	0.13	0.11	0.07	0.07	0.07	0.12
	Health state	0.36	0.41	0.27	0.60	0.32	0.49	0.64

Table 3

Convergent validity (Weighted quadratic kappa) between the items of the "QUALITOUCH Activityindex" and the "EQ-5D-3L"

		QUALITOUCH Activityindex						
		Maximum pain	**Average pain**	**Sleeping Quality**	**Household activities**	**Leisure activities**	**Work activities**	**General state of health**
EQ-5D-3L	**Mobility**	0.23	0.10	0.08	0.19	0.06	0.25	0.11
	Self-care	-0.02	0.01	-0.02	0.06	0.04	0.02	0.07
	Usual activities	0.23	0.08	0.14	0.17	0.16	0.37	0.15
	Pain/ discomfort	0.42	0.25	0.41	0.38	0.21	0.40	0.18
	Anxiety/ depression	0.03	0.06	0.08	0.03	0.04	0.10	0.00
	Health state	0.34	0.36	0.26	0.58	0.27	0.48	0.62

Table 4

Internal consistency (Cronbach's alpha) between the items of the "QUALITOUCH Activityindex" and the "EQ-5D-3L"

Reliability statistics		Reliability statistics	
Cronbach Alpha	Number of items	Cronbach Alpha	Number of items
.726	7	.839	6

		Item scale statistics				Item scale statistics			
		mean if item omitted	mean if item omitted	Corrected item-scale correlation	Cronbach Alpha, if item omitted	mean if item omitted	mean if item omitted	Corrected item-scale correlation	Cronbach Alpha, if item omitted
QUALITOUCH Activityindex	Maximum pain	266.04	8411.66	.655	.640	213.44	9232.08	.669	.892
	Average pain	285.63	9133.64	.692	.651	233.02	9866.74	.743	.798
	Sleeping quality	284.48	9387.49	.335	.722	231.88	10125.13	.373	.865
	Household activities	270.42	8167.91	.735	.620	217.81	8750.96	.807	.775
	Leisure activities	264.17	8941.84	.594	.660	211.56	10050.17	543	.826
	Work activities	278.75	7728.19	.612	.644	226.15	8275.79	.676	.802
	General state of Health	266.77	13090.95	-.290	.839				

A Swiss study by Roth et al. [21] on 66 participants with lumbar back pain found medium to high correlations between items of the "QUALITOUCH Activityindex" and corresponding items of the "SF-12". It was concluded that both instruments measure similar dimensions.

Ren et al. [20] showed in a study with patients with rheumatoid arthritis in China that the items of the "QUALITOUCH Activityindex" showed high correlations ("r=0.73 ($p < 0.001$)") with corresponding items of the "Health Assessment Questionnaire" (HAQ). Therefore, the authors assumed that the "QUALITOUCH Activityindex" provided valid results. Furthermore, they argued that the "AI" is easy to use for therapists in practice and can document subjective impairment over time as a progression parameter.

Due to the different questions about pain and impairment ("AI") and the quality of life ("EQ-5D-3L"), different response levels (5 levels ("AI"), 3 levels ("EQ-5D-3L") and the slight time shift between completing the "AI" and the "EQ-5D-3L", the observed moderate correlations can be explained.

For further studies, the use of the "EQ-5D-5L" is recommended since this version of the "EQ-5D" also contains five response dimensions like the "AI". This eliminates the initially necessary response reduction of the "AI" to three dimensions and partially resolves reduced data consistency.

However, it should be noted that the original goals of the two questionnaires are different. The "AI" is intended to record pain or complaints and its impairment in household activities, leisure activities, work activities, as well as the assessment of the general state of health and in addition patient satisfaction with the therapies carried out and the achievement of therapy goal are assessed, i.e. to measure the quality of therapy outcome [24].

Whereas the "EQ-5D-3L" measures the patient's quality of life in five different dimensions. The questioning is different in each case. The "AI" asks about limitations (consequences of the disease) and the "EQ-5D-3L" about

quality of life. The items "leisure activities" and "general activities" as well as "general state of health" (rho = 0.59 and rho = 0.64; both $p < .001$) therefore correlated most strongly. Without the item "general state of health", the internal consistency of the "QUALITOUCH Activityindex" increases from Cronbach's alpha 0.73 to 0.84. The question about general health status implies a broader response variance compared to the specifically formulated items about complaints and impairments. When using the "QUALITOUCH Activityindex" alone to assess the quality of treatment outcomes, the item "general state of health" should be included. If the quality of life is additionally assessed with a corresponding instrument, the item "general state of health" could be omitted.

The word "index" as a name implies a sum score or a value as a result of the instrument that can be compared. A score exists in the "EQ-5D-3L" in the form of a five-digit number as a health profile. This is not provided for in the current version of the "AI". A sum score could be useful and desirable in order to show the change in results with only one number. An adapted presentation of the results, for example as a spider diagram, could make the "AI" even more comprehensible regarding limitations of participation. Further research is needed to determine to what extent this can deliver implemented, reliable and valid results.

The AI can also be used for sports injuries. For more specific questions (regarding more precise functional limitation and evaluation of complaints) and in elite sport, an injury specific PROM questionnaire should possibly be used in addition to the AI.

Conclusions. The "QUALITOUCH Activityindex" seems to have the potential to be used as an easy-to-use instrument in physiotherapeutic practice for assessing the status of patients in household activities, leisure activities and work activities. Due to the different questions and answer dimensions, the moderate correlations and parallel reliability values can be explained.

In order to use the "AI", clear therapy goals must be formulated with the patient at the start of therapy. Otherwise, this item "how well did you achieve the therapy goal" (Question 8) cannot be queried and measured as a quality control feature.

The "AI" has been compared with the "SF-12" and the "EQ-5D-3L". Both questionnaires are primarily used in the European health care system. In the American health system, the Global Health 10 – Score, which is part of the "PROMIS" (Patient-Reported Outcome Measurement Information System), is used. A further comparison with this instrument could be the subject of future research, insofar as the "AI" as a generic instrument offers potential for a broad application, especially in the field of patient's participation.

Further research on the use of the "AI" as a progression parameter would also be useful [27]. The investigation of the practicability and feasibility in everyday practice of physiotherapy should also be examined. This might then be used as a basis for a broad implementation of the generic "PROM" "QUALITOUCH Activityindex" (AI).

Nomenclature/ Abbreviations

AI QUALITOUCH Activityindex

DIMDI German Institute for Medical Documentation and Information

EQ-5D-3L European Quality of Life Qol-5D-3L

EQ VAS The visual analogue EQ scale

HFG Humanforschungsgesetz/ Human Research Act

ICF International Classification of Functioning and Disability of the World Health Organization

κ Kappa-value

KVV Federal Health Insurance Ordinance

NRS Numeric Rating Scale

PRO Patient-Reported Outcomes

PROM Patient-Reported Outcome Measures

rho Spearman-Korrelation

SF-12 Short-Form-Health Survey, Survey instrument for the Assessment of health-related quality of life

Resource Identification Initiative

RRID:SCR_002865

Additional Requirements

– Non

Conflict of Interest

R.T., Board of Trustees for Science and Research of the "QUALITOUCH- Healthcare Foundation" (QUALITOUCH-HC). The "QUALITOUCH-Healthcare Foundation" developed and validated the "QUALITOUCH Activityindex". The "QUALITOUCH-HC Foundation" operates the electronic database for data acquisition of the Activityindex. The brand (QUALITOUCH-HC) is owned by Medcap GmbH. Data for this study was provided anonymously to the study group. They had no influence on the research question, methodology or data interpretation.

Author Contributions

CL and RT contributed to conception of data collection. RT organized the database. HB and JT developed the project design. ES performed the statistical analysis. ES wrote the first draft of the manuscript. All authors contributed to manuscript revision, read, and approved the submitted version.

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Supplementary Material

Data Availability Statement

The datasets for this study can be retrieved in anonymized form from the corresponding author upon email-request.

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