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CONTENT

PRINCIPLES OF MODERN GNATHOLOGY

Jiří ŠEDÝ, Tomáš HANZELKA, Radovan ŽIŽKA, Zdeněk TAUBER, Barbora HOCKOVÁ

Abstract

This review summarizes the fundamental principles of modern gnathology, viewed as an interdisciplinary field connecting the classical gnathological foundations with modern rehabilitation medicine and other fields. It mainly focuses on Panjabi´s stabilization subsystems, functional curvatures of structures, relations of soft and hard tissue, balance of forces, equilibration of movement apparatus, phenomenon of extreme, crucial role of axis vertebra, Rocabado tricentric concept, circular pattern of movement, dorsoventral approach, relation of articular components, functional units, biological reaction, cervico-cranio-mandibular dynamics and origin of craniomandibular pain.

Keywords

gnathology; temporomandibular joint; cervical spine; posture

INTRODUCTION

Gnathology (from greek *gnathos* – jaw, *logos* – science) is a scientific and clinical discipline which studies orofacial, or so-called stomatognathic or craniomandibular system. It represents a subdiscipline of kinesiology, as well as biomechanics. From today´s perspective, it is quite old discipline. The term "gnathology" was first introduced by US orthodontist, Harvey Stallard (1888–1974), in the beginning of 20th century. Around year 1920, the discipline has been defined by a "father of gnathology", Beverly B. McCollum (1883–1968) as a scientific discipline focused on biological mechanisms of mastication, i. e. morphology, anatomy, histology, physiology, pathology and treatment of oral apparatus, mainly jaws, teeth and relations of these structures to other body parts (Nelson & Landau, 1999). Specialist in gnathology is traditionally named **gnathologist**, although he/she is often dentist (prosthodontist/orthodontist) by his/her main profession. Nowadays, many specialists in manual medicine (physiotherapists) are starting to focus on this problematic as well.

Today, a classical definition of gnathology remains valid, although it has been expanded significantly on the basis of large amount of scientific and clinical data obtained until now. From modern perspective, gnathology examines the mutual structural and functional relations of jaws and teeth, provided by muscles, temporomandibular joint (TMJ), cervical spine and posture. It thus remains a clinical kinesiology (including biomechanics) of the cervico-cranio-mandibular system. It stands on the border between morphology/physiology and pathology/pathophysiology of the orofacial system. It helps to understand the role of particular orofacial structures (teeth, periodontium, chewing muscles, trigeminal nerve etc.) in normal function, as well as their role in etiopathogenesis of particular disorders, mainly occlusal disorders, temporomandibular dysfunctions (TMD) and bruxism, as a foundation for proper treatment (Šedý et al., 2022).

It remains important in restorative, but mainly in prosthetic and orthodontic (orthognathic surgical) treatment of teeth, mainly in terms of integration of new treatment into the functional correlativities of patient´s stomatognatic system. In several last decades, the gnathological principles (including the role of occlusion) showed their importance in particular disorders of the musculoskeletal apparatus, mainly disorders of the upper cervical spine, temporomandibular disorders and bruxism.

Gnathology focuses mainly on four aspects. First, it examines the morphology and physiology (kinesiology, biomechanics) of teeth, jaws, temporomandibular joint, cervical spine and related fibrous and muscular structures. Second, it studies their mutual

relations in health and disease. Third, it examines parts of the peripheral and central nervous system which are controlling and coordinating functions of above-mentioned structures in health and disease. Last but not least, it studies its relations with digestive tract (tongue, pharynx) and respiratory tract (nasal cavity, nasopharynx, breathing and sleeping patterns).

The main difficulty of gnathology is that it integrates the hard tissues (morphology, relations, measurements, imaging) and soft tissues (tension, pressure, traction, pain). The gnathologist (or his/her team) thus must be able to work both with hard tissue (change of tooth occlusal morphology, change of tooth/jaw relations, re-alignment of cervical vertebrae) as well as soft tissue (treatment of muscle spasms, trigger points, training of weakened muscles). This two-in-one role is quite unusual for both, dentist, focused mainly on hard tissues and objective data (measurements, photography, imaging), and manual therapist (physiotherapist), who is more focused on soft tissue and thus more on subjective data (tension, pain, palpation perception). If the gnathologist focuses only on one aspect of the gnathology, the other aspects can completely prevent or abolish his/her therapeutic attempts. One of the most important principles valid in the whole gnathology remains the well-known third Newtonian law – the law of action and reaction. In second half of 20th century, the gnathology not always respected these principles, so a typical "man with a hammer syndrome" (term derived from Mark Twain´s quote "to a man with a hammer, every problem looks like a nail" as a metaphor to tunnel vision) appeared. It had form of typical deadlocks, including focusing only on tooth occlusion ("occlusionists"), grinding of teeth ("occlusal equilibrationists") or the position of the disc of the temporomandibular joint ("discomaniacs") (Rocabado & Iglarsh, 1991; Rocabado et al., 1982, 2021; Ricketts, 1969). Atlhough all these procedures have their place in gnathology, focusing only on them in ALL patients made a lot of harm in the history.

Although the term "gnathology" might sound archaic to some authors, there is no reason to not continue to use it, because until now we do not have better, more fitting, simplier and/or more useful term. In principle, any new term is not necessary; what is but necessary is not the change of the name but the change of the term´s content. The main problem of the modern gnathology is not its terminology, but the establishment of abundance of gnathologic schools, which are either not at all or insufficiently communicating among themselves. Each of this schools have its own indisputable "truths", often more or less confidential, which revelation is bound on membership and enrolment on often very expensive training courses, thus resembling religious sects. If their member is asked about particular problem, the questioner is often told that "the problem is too difficult to be answered briefly" or that he/she should join the school or come to the training course. Moreover, lot of these schools does not work using evidence-based medicine, which turns them aside from fundamental principles of the whole medicine as well as from classical gnathology, as defined by its founders. Rinchuse & Kandasamy (2009) refer about "*pseudo-science based on mechanistic, perfunctory procedures, and instrumentation. There are many contemporary occlusal institutes that clearly have perverse views on gnathology that are not evidence-based […] gnathology that are based on rhetoric, blind faith, art, emotionalism, and practice management rather than on science and evidence"* (Rinchuse &Kandasamy, 2009). Lysle Johnston sarcastically stated that "*gnathology is the science of how articulators chew*" (Johnston, 1990). Similarly, the problem is present in TMJ problematic, as stated by Dawson (1996): "*The literature is rarely specific about the type of TMD that is discussed, researched, or treated. Typically, only symptoms such as joint sounds, limitation of motion, and discomfort in the region of the TMJ are listed. Any or all of these symptoms can be caused by a variety of structural disorders with different causes and thus require different treatment with vastly different expectations regarding prognosis*." (Dawon, 1996). The problems of the scientific approach to modern gnathology has been critically discussed by Rinchuse &Kandasamy (2009).

Importantly, modern gnathology has significant gaps in interdisciplinary cooperation, typically among dentist, manual therapist, rehabilitation

specialist, psychologist, neurologist and other specialists. It is important to name and recognize all these problems and continually shift the gnathology further to the goal of the healthy and happy patient with minimum risk of treatment complications. The aim of this review is to summarize some of the fundamental principles of modern gnathology.

Panjabi´s stabilization subsystems

American orthopedist and rehabilitation doctor, Manohar M. Panjabi (*1936), in 1992 divided stabilization systems of the spine to three subsystems, which all are very tightly related to each other both physiologically and clinically (Panjabi, 1992). This article remains one of the most cited articles in the field (more than 1500 citations in Web of Science in 2025).

Passive musculoskeletal system (osteoligamentous subsystem) includes vertebrae, intervertebral disks, facet joints, spinal ligaments, joint capsules and passive (fibrous) component of muscles. In neutral (basic) spinal position, the fibrous part of this subsystem does not need to work – it starts to function on border movements where it provides reactive (resistant) forces to prevent further movement over the physiologic range. This subsystem is passive in terms of active movement, it but plays an important role in signalling (feedback) to what is going on in the tissue. Dysfunction of passive subsystem occurs in case of mechanical (structural) disturbance of its components such as ligament elongation, tear of the intervertebral disc, (micro)fractures of bones, prolapse of the intervertebral disc. All these factors decrease the load bearing capacity as well as stabilizing capacity of the spine. Usually, these changes are irreversible, so for the improvement, we must focus on increasing of the effectivity of the active subsystem. Adaptive changes of passive subsystem usually occur during aging, typically in the form of osteofytes (spondylofytes) or fusion of neighboring vertebrae (Panjabi, 1992).

Active musculoskeletal subsystem (musculotendinous subsystem) includes muscles and tendons surrounding the spine, i. e. all active components able to generate force, which moves particular passive subsystem components as well as stabilizes them. The system is not autonomic in terms of its own function, it but has its crucial role in signalling (proprioception, feedback) to central nervous system. Dysfunction of active subsystem occurs when decrease of its signalling, movement ability (contraction, muscle tone) and feedback to central nervous system develop. Dysfunction results mainly from muscle trauma, inactivity, disease or degeneration. These changes result in decrease of spinal stabilizing capacity, composed of decrease of the ability to compensate the structural problems of passive subsystem, as well as the ability to compensate the border movements. Adaptive changes of active subsystem are increase of the muscular mass as well as its strength, able to generate significantly higher muscle tone (Panjabi, 1992).

Nervous controlling subsystem includes parts of the peripheral and central nervous system involved in signalling from spine area (from both passive and active subsystems), movement of the spine as well as the control of the spinal movement. Dysfunction of nervous subsystem occurs when afferent, central or efferent part of the pathway involved in the movement of the spine is impaired. Dysfunctional nervous subsystem activates the active subsystem inadequately, which leads to disorders of both active and passive subsystems (Panjabi, 1992). Adaptive changes of nervous subsystem are significantly underestimated but have a large therapeutic potential so it should be further elucidated in future.

Functional curvatures of structures

Although we might consider majority of structures in human body to be more or less straight, the opposite is true. Majority of bones and articular faces do not run straight or in one plane, but are curved, mostly in all three planes. Muscle fibers, described in textbooks as straight fibers running from the muscle origin to its attachment, are in fact more or less curved. Moreover, their function (direction of forces) is significantly modified by fasciae and ligaments, which inner structure is mostly plexiform. The spine is also curved in all parts, forming lordoses, kyphoses and “physiologic” scolioses. Thus, central nervous system receives afferent informations mainly from 3D curved, not straight structures; thus, we must always diagnose as well as treat in 3D, not in 2D (Gelb, 1994).

Relations of soft and hard tissue

These relations can be approached from different perspectives. From anatomy, we know that hard tissues provide support for soft tissue and inversely, soft tissues delimit their space relations. For the proper function, joints need mainly stability, together with muscles also freedom of movement (Rocabado & Johnston, 1992). But, if the soft tissue works in opposition to hard tissue (e.g. increased tension, spasm), the hard tissue is at risk of wear, degeneration, atypical remodelation, fracture). When adapted to gnathology, we can say that "*When teeth and muscle are in war, muscle never loses"* (Dawson, 2007). Soft tissue works usually with light forces, but 24 hours a day. The injury of soft tissue usually precedes the injury to hard tissue. Thus, in therapy, it is important to start with soft tissue (release of muscle spasms, elimination of trigger points, restoration of proper length of ligaments and joint capsules) and thus restore the physiologic parameters of movement of particular hard tissues in relation to each other. Moreover, it is crucial to appraise the typical signs of teeth damage (abrasion, infraction, fracture, periodontal overload) as signals of inadequate arrangement and/or function of surrounding soft tissues.

Balance of forces

All structures of orofacial system have the tendency to reach the balanced state. If such balance is disrupted, we need to count with particular opposite effect, in relation with third Newton´s law. For example, if the vertical dimension of occlusion is increased (e.g. by prosthetic crowns), we obtain the posteriorotation of the mandible and compensatory (reciprocal) posteriorotation of the head with potential decrease of intervertebral functional spaces and subsequent risk of cervical spinal nerve entrapment (Šedý et al., 2022).

Equilibration of movement apparatus

The main goal of gnathology is an achievement of harmonious arrangement in all joints, ligaments and muscles of the body, mainly in cervico-cranio-mandibular system. It represents such arrangement where the soft tissue has optimal tension, articular facets are properly aligned (related to each other), in optimal distance, the move fluently in optimal range, without any disturbances such as sound phenomena or pain (Šedý et al., 2022).

The phenomenon of extreme

In order to adjust the optimal parameters for particular function, the human body uses data obtained from limits of this function. Thus, for optimal function, we need to expose our bodies every day to both limits, maximum function as well as maximum silence. For movement apparatus, it means load with force (muscle, bone), range (muscle, ligament, tendon, fascia) and endurance (muscle, cardiovascular system, respiratory system). If the body does not reach its limits, after some time it adapts (accommodates) to lower limits thus decreasing its abilities to work under worsened conditions in future. This function is a typical evolutionary maladaption – the result of non-use of phenomenon of extreme represents one of the most important sources of civilization disorders (Wallace et al., 2018). The phenomenon of extreme can be applied to almost every function of the human body.

Crucial role of axis vertebra

Second cervical vertebra (axis) has a crucial role in gnathology, because its alignment dictates the position of the head, i. e. the position of the temporomandibular joint fossae. On the other hand, the position of the mandible is mainly delineated by its attachment to surrounding structures, mainly muscles and ligaments. When there is a significant discrepancy between fossae (i.e. head – C2 vertebra) and condyles (mandible) of the temporomandibular joint, first the functional, later the structural disorders of the temporomandibular joint can develop. Thus, it might be optimal in many cases to start the treatment of temporomandibular disorders by proper aligment of this vertebra (Šedý et al., 2022; Rocabado et al., 2021).

Rocabado tricentric concept

This concept has been developed by Chilian manual therapist specialized in cranimandibular field, professor Mariano Rocabado (Rocabado and Iglarsh, 1991, Rocabado et al., 2021). Tricentric concept incorporates (1) craniovertebral, (2) cranio-mandibular, and (3) centric occlusion at rest, all mutually coordinated to allow proper masticatory function and mouth sensory and motor control. The automatic and dynamic interactions of the three interconnected systems allow for a stable and lasting relation of the mandibular condyle joint facets, functional masticatory

system, and physiology of the mouth motor and sensory control. This automatic dynamic mechanism allows for a stable, fossa-condyle, long-lasting, congruent joint-surface relation. Any change in any of these systems automatically affects the other systems (Šedý et al., 2022; Šedý, 2021).

Circular pattern of movement

Structures in cranio-mandibulo-cervical system do not move in 2D, as some didactical schemes and simplifications might indicate, but in 3D space, mostly as a sphere. Typical such simplification is the description of the movement of the mandibular condyle in relation to fossa only in sagittal plane (lateral view), describing the movement of the condyle as a combination of rotation and translation in sagittal plane. In real situation, even in pure mandibular depression, the condyles of the mandible are shifted slightly laterally, as can be palpated ventral to tragus by fingers of the therapist. Moreover, pure depression and elevation is quite rare during normal life; in majority of cases some laterotrusion is added, during chewing most significantly. Then, we can find that condyles are moving on a plane which makes a surface of a sphere. Moreover, majority of movements of craniovertebral articulations are also moving on such plane – although the articular fasets of singular joints might not indicate such movement, when the influence of soft tissue (mainly ligaments) is added, the complex movements show circular pattern of movements (Rocabado &Iglarsh, 1991; Šedý et al., 2022). In all cases, it is important to evaluate both the pathway of the movement as well as the instantaneous center of rotation, around which the movement is done (Bogduk &Mercer, 2000).

Dorsoventral approach

Majority of dentists are accustomed to evaluate the stomatognathic system from anterior (teeth, periodontal tissue) to posterior (muscles, temporomandibular joint). From the perspective of modern gnathology, it is much better to act in opposite direction. It is beneficial to first evaluate the position of the skull in relation to the rest of the body (posture, axial system) and after that evaluate the relation of the mandible (condyles) to the skull (TMJ fossae). It is necessary to begin with the center of the body (axial system), from which majority of body movements originate, not the peripheral and most movable part of the system (mandible). From the gnathologic perspective, the most important step is thus to find the optimal position of the skull (TMJ fossae) to which the mandibuble should be manipulated and not to manipulate the mandible correctly to incorrectly aligned fossae (Rocabado et al., 2021; Šedý et al., 2022). If the mandible is manipulated first, it might fixate the incorrect spinal (axial) alignment or even worse, deteriorate the misalignment even more and cause significant problems such as headache, vertebral pain, vertigo or autonomic dysbalances, which not many specialists would relate to previous dental treatment (Rocabado et al., 2021). Such approach is contradictory to a basic principle in rehabilitation medicine – in complex cases, therapist need to always work from the center of the body to the periphery, not the opposite (Rocabado et al., 1982). Metaphorically, it can be compared to a situation when a person would buy furniture and after that is trying to find the proper house the furniture would fit in.

Relation of articular components

Each joint has two or more components, so it is important to always evaluate all these components, not only one. In the history of gnathology, for a long time, there was a major fault to evaluate only the position of the condyle according to fossa, omitting the misalignments of fossa as well as articular disc. Even today, many dentists tend to believe that all problems of TMJ arise from the misalignment of condyle or condyle and articular disc. They are thus “positioning the condyle” which results in even more tension (strain) and counter-reaction of muscles and ligaments than the previous situation. Thus, for the proper TMJ diagnosis, we need to always evaluate the relations to all, fossa, disc and condyle to other two components of the joint.

Functional units

Muscles, tendons, aponeuroses, ligaments, fasciae and joints (including capsules, articular discs etc.) are not working solely as might be assumed from the study of systematic anatomy, but they are working as functional units. Although manual therapist are trained to think that way, dentists are mainly not – they are more train to heavily focus on

particular partial problems, which but sometimes leads to the loss of the general picture. Typical example of such functional unit is vertebral segment, composed of two adjacent vertebrae with all related joints and soft tissue, which has been described in high level of detail in many publications. Typical examples from the stomatognathic system are the functional units which move with the mandible in particular direction. In anatomy, typically four masticatory muscles are described in textbooks (masseter, temporalis, both pterygoid muscles). However, many other muscles are involved in mastication. Therefore, it is much more clinically useful to divide muscles of mastication to two main groups, supramandibular (masseter, temporalis, both pterygoids, superior pharyngeal constrictor) and inframandibular (suprahyoids, infrahyoids, medial and inferior pharyngeal constrictor). From this perspective, it would not be so surprising that bruxism would be much more related to dysfunction of inframandibular masticatory muscles than supramandibular, which are more or less reacting to the situation than being the primary cause (Šedý et al., 2022; Šedý, 2021).

Biological reaction

Every tissue in human body does not react to manipulation or irritation immediately, but with some latency. In case of reflex, the response is often very quick (usually miliseconds), in majority of other cases there is longer latency. In case of pressure and tension applied to soft tisse, the latency is approximately **6–10 seconds**. If we work with soft tissue, it is crucial to wait for the positive/negative reactions of the tissue (release, redness, increased sensitivity, irritation) as well as the patient (relaxation, relief, pain, vertigo). If the technique is not used in diagnostic, but therapeutic intention, it is important to continue only if the therapist is able to influence the tissue in positive manner – only then is the compliance of the patient and positive therapeutic effect possible. Typical exceptions are provocative diagnostic tests – they are but performed only shortly, with clear purpose and the patient is cautioned about the possibility of negative reaction. Joints react to a change in the position of particular components usually after **90 minutes**, in many cases even later. Thus, the positive/negative effect of joint manipulation or application of jaw appliance could be evaluated after such time interval, not earlier (Šedý et al., 2022).

Cervico-cranio-mandibular dynamics

Cervico-cranio-mandibular system is extremely dynamic system – it is a fact we must accept. With every movement in the system, the following changes occur: the distance and mutual position of articular facets, length and tension of muscles, ligaments and articular capsules and mutual position of jaws as well as position of teeth in alveoli. Although majority of these changes are very minute (sometimes micrometers), they are extremely important for the proper function of the whole system. A very small change in one part of the system can cause very large change in other parts of the system. For example, a shift of the articular surfaces of intervertebral (facet) joints C2/C3 of 1 mm causes the change in vertical dimension of the occlusion up to 3 mm (Rocabado & Iglarsh, 1991, Rocabado et al., 1982, 2021).

Origin of craniomandibular pain

For the proper evaluation of pain in cervico-cranio-mandibular system, it is extremely important to understand that pain arises mainly from irritation of soft tissue, not the hard tissue. Dentists clearly understand pain originating from dental pulp and oral mucosa, but not always accept that such tissues as muscles, ligaments, articular capsule and synovial folds could also cause significant pain. The main problem is that dentists are trained to evaluate mainly hard tissue (X-ray, CT, measurements, fabric models, digital scans) and if nothing is present (visible) there, they tend do believe that the pain might be psychosomatic, neuropathic etc. However, majority of functional problems of stomagnathic system is located in soft tissue, whereas structural changes of hard tissues are not yet developed, so they are not visible. It is thus necessary to evaluate the patient also with systematic palpation of soft tissue as well as qualitative assessment of joint functions.

CONCLUSIONS

Modern gnathology is a fascinating multidisciplinary field, where the knowledge from classical gnathology (teeth, jaws, TMJ) integrates with rehabilitation medicine (posture,

muscles, ligaments etc.) to a very complex science, able to help our patients with many complex problems such as functional problems of cervical spine, temporomandibular disorders or bruxism. Although the term “gnathology” sounds archaic to some authors, there is no reason to not continue to use it, because until now we do not have better, more fitting, simpler and/or useful term. In principle, the development of a new term is unnecessary; what but necessary is – not changing of the name but changing the term´s content.

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THE IMPACT OF SOCIAL MEDIA ON THE EATING HABITS OF ADOLESCENTS

Nikola ŠTIKOVÁ, Pavel KYSEL

Abstract

***Background**: The influence of social media on adolescents' eating habits is increasingly discussed, as social platforms often shape young people's lifestyle choices and attitudes toward nutrition. This study aimed to examine whether the content shared on social media affects food choices, daily dietary decisions, and the overall approach of adolescents to nutrition. Partial objectives included identifying what types of nutrition-related content adolescents follow, whether it influences their behavior, and to what extent they are able to distinguish between reliable and misleading information.*

***Methods**: A quantitative online questionnaire survey was conducted among adolescents aged 15–19 years. A total of 356 responses were collected, of which 344 were analyzed after excluding respondents outside the age criteria. The sample consisted of 73.5 % girls and 26.5 % boys from various types of secondary schools. The questionnaire contained 27 questions covering demographic characteristics, eating habits, influence of social media on food choices, and self-perception. Data were processed in Microsoft Excel using descriptive statistics and expressed in absolute numbers and percentages.*

***Results**: Social media were shown to have a dual impact on adolescents. On the one hand, they can motivate healthier eating habits and support an active lifestyle. On the other hand, they often create pressure to conform to unrealistic appearance ideals and may promote unbalanced dietary practices. Respondents reported being influenced by nutrition- and fitness-related content, with varying levels of trust in its reliability.*

***Conclusions**: The study confirms that social media significantly affect the eating habits and attitudes of adolescents, with both positive and negative consequences. The findings highlight the importance of strengthening media literacy, critical thinking, and nutrition education, not only from professionals but also within schools and families.*

Keywords

social media; adolescents; eating habits; dietary behavior; media literacy

INTRODUCTION

Nutrition is a highly relevant and widely debated topic, particularly among adolescents. Social media play a central role in their daily lives, shaping leisure activities, exposure to influencers, and engagement with current trends. Nutrition-related content—including diet tips, meal plans, fitness guidance, and health-promoting products—is frequently shared, potentially influencing not only dietary behavior but also body image and the internalization of appearance ideals.

Adolescence represents a sensitive developmental stage marked by physical, psychological, and social changes. During this period, young individuals search for identity, compare themselves with peers, and are highly susceptible to external influences. Social media thus serve both as a source of inspiration and as a potential risk factor, contributing to social comparison, body dissatisfaction, and distorted perceptions of nutrition and lifestyle. Non-evidence-based recommendations circulating online may promote restrictive eating patterns, guilt, and dysfunctional relationships with food.

Adolescents' lifestyles are increasingly shaped by rapid digitalization, with virtual environments profoundly affecting both physical and mental health. According to the World Health Organization (WHO, 2025), mental health represents a key determinant of adolescent well-being, yet prevalence rates of

depression, anxiety, and behavioral disorders continue to rise, with adverse effects on academic achievement, social functioning, and quality of life. Digital technologies and social media, although offering opportunities for education and connectivity, are strongly associated with risks such as low self-esteem, heightened anxiety through social comparison, disrupted sleep, and weakened family relationships (Browne et al., 2021). Developing media literacy is therefore essential for distinguishing beneficial from problematic media use.

In parallel, adolescents' nutritional and physical activity patterns have undergone significant change, with sedentary lifestyles and increased consumption of fast food further exacerbated during the COVID-19 pandemic. Evidence shows a marked decline in physical activity and an increase in sedentary screen time during lockdowns, contributing to weight gain and unhealthy dietary behaviors. For instance, 63 % of Korean adolescents reported no physical activity during 2020 (Kim et al., 2022), while nearly 42 % of adolescents globally experienced weight gain linked to increased intake of energy-dense foods (Stavridou et al., 2021). These findings highlight the complex interplay of digital media exposure, lifestyle behaviors, and public health crises in shaping adolescent health outcomes.

Adolescent dietary habits are shaped by a complex interaction of biological, psychological, and social factors. Family environment, peer influence, and broader societal dynamics play a decisive role in this process. Nutritional demands increase during adolescence due to growth and hormonal changes, while autonomy in food choices simultaneously expands. Evidence indicates that family practices and parental attitudes are central to the development of healthy dietary patterns, whereas pressure during meals, unrestricted access to unhealthy foods, or adverse environments may foster maladaptive behaviors that persist into adulthood. Social media further amplifies these influences, exerting both beneficial and detrimental effects on adolescents' eating behaviors and body image (Scaglioni et al., 2008).

Children's eating habits are shaped from early childhood, with the mother playing a pivotal role during infancy through feeding practices. Breast milk adapts its flavor according to maternal diet, thereby providing infants with their first sensory exposure to diverse tastes and influencing long-term food preferences (Procházková et al., 2021). A positive family mealtime atmosphere fosters healthy dietary patterns, whereas coercion or pressure during eating may create aversions that persist into adulthood. Conversely, parental support and autonomy in food choice promote self-regulation and a healthier relationship with food. Role modeling by parents and older siblings further reinforces these behaviors (Procházková et al., 2021; Kudlová & Mydlilová, 2005). Restrictive feeding practices, including prohibitions or excessive monitoring, can undermine appetite regulation and increase preferences for unhealthy foods. In contrast, regular family meals and repeated exposure to nutritious foods support the development of lasting healthy habits, while contributing to the prevention of obesity and eating disorders (Scaglioni et al., 2008).

Nutrition in childhood and adolescence represents a critical determinant of healthy growth and development, with profound implications for both physical and mental health. Adequate nutrition not only supports optimal growth and body composition but also contributes to the prevention of chronic diseases such as obesity, diabetes, and cardiovascular disorders. Each developmental stage—from infancy through adolescence—carries distinct nutritional requirements aligned with growth dynamics and energy demands (Corkins et al., 2016). Common dietary shortcomings among adolescents include irregular meal patterns, low intake of core food groups (dairy, fruits, vegetables, whole grains), and excessive consumption of highly processed foods such as sweets, salty snacks, and fast food. These products, rich in fats, sugars, and salt but poor in vitamins, minerals, and fiber, may result in nutritional deficiencies and increase the risk of obesity (Martinča & Kysel, 2018; Rusková, 2011; Corkins et al., 2016). Skipping breakfast and disordered eating routines further exacerbate these risks.

Declining physical activity represents an additional challenge. According to the World Health Organization (WHO, 2019), over 80 %

of adolescents aged 11–17 fail to meet recommended physical activity guidelines—at least one hour of moderate-intensity movement daily. Similar trends are evident in the Czech Republic, where in 2022, 73 % of boys and 82 % of girls in this age group did not achieve recommended activity levels (WHO, 2024). Insufficient physical activity compounds the prevalence of obesity and associated health concerns among youth.

Adolescents are spending increasing amounts of time on social media, significantly shaping their daily lives. The average daily screen time among adolescents exceeds four hours, with peak activity occurring between 6 p.m. and 11 p.m. (Blahošová et al., 2023).

Recent global surveys indicate 5.04 billion active social media users, accounting for approximately 62.3 % of the world's population (Meltwater, 2024). Among adolescents, TikTok, Instagram, and Snapchat remain the most popular platforms. In the Czech Republic, 98 % of individuals aged 16–24 use at least one social network, with TikTok, Snapchat, and Instagram recording the most substantial growth (MediaGuru, 2023; Bradley & Whateley, 2024).

TikTok, distinguished by its short-form video content, appeals primarily to younger audiences and is among the fastest-growing social media platforms. By 2023, it reached 1.5 billion monthly active users, with projections of 1.8 billion by the end of 2024 (Tafradzhiyski, 2025). Users spend an average of 95 minutes per day on TikTok, accessing the app around 19 times daily (Pollock, 2025).

Instagram allows users to share photos and videos, enhanced by features such as hashtags and ephemeral „Stories". It has become the most widely used platform among U.S. teenagers, with 87% reporting monthly use in 2024, up from 80 % the previous year (Bradley & Whateley, 2024).

Snapchat, focused on single-view photo and video sharing, is also dominated by adolescent users. In summer 2024, the platform reported 443 million daily active users worldwide (Dixon, 2025a).

Pinterest, though less popular overall, is gaining traction among younger demographics, particularly women aged 18–24. Unlike other platforms, Pinterest emphasizes inspiration and idea collection through virtual boards (Dixon, 2025b).

By contrast, Facebook has experienced a marked decline in adolescent popularity. In 2022, only 32 % of U.S. teenagers aged 13–17 reported using the platform, compared to 71 % in 2014–2015 (Newberry, 2025). Nevertheless, Meta announced in 2024 that Facebook has attracted its largest number of young adult users in the past three years (Paul, 2024).

Social media strongly influences adolescents' dietary habits, with both positive and negative consequences. Platforms such as Instagram and TikTok provide inspiration for healthy lifestyles through food photography, recipes, and campaigns promoting balanced nutrition (Pilař, 2023). At the same time, these platforms often reinforce appearance-related pressures, which may contribute to body dissatisfaction and eating disorders (Pipová et al., 2021). The reliance of young people on influencers—whose advice is not always evidence-based—can further increase health risks (Xu et al., 2024).

Influencers have become a defining phenomenon of contemporary digital culture, shaping opinions, behaviors, and consumer choices. They are often described as individuals who significantly affect others' decisions without assuming direct responsibility for them (Brown & Hayes, 2008). Globally, over 4.74 billion people use social media, and nearly half follow at least one influencer (Ahlgren, 2025). Among the most affected areas is nutrition, where influencers promote trends such as veganism, vegetarianism, low-carb diets, paleo, or so-called "clean eating." Although lacking a precise definition, clean eating generally emphasizes the elimination of processed foods and the consumption of natural ingredients. On social media, this trend spreads rapidly via hashtags such as #cleaneating or #eatclean, with influencers often setting implicit norms of what constitutes "healthy" food (Walsh & Baker, 2020; Pilař et al., 2021).

Food imagery plays a crucial role in shaping eating behaviors. Studies indicate that visual presentation influences appetite and food choices. While curated images may encourage healthier dietary practices, they can also foster unrealistic expectations and perfectionism (Hawkins et al., 2024). A prominent example are “What I Eat in a Day” videos, where influencers showcase their daily diets. Such content may inspire positive changes but often promotes restrictive or unbalanced eating patterns. This underlines the importance of media literacy and transparent nutrition education (Topham & Smith, 2023).

Social media can also contribute positively by providing a space for knowledge exchange, peer support, and accessible health education. Adolescents often engage with short videos, infographics, or challenges that encourage incremental changes in lifestyle. This type of accessible communication increases awareness even among individuals who would not otherwise seek out nutrition-related information (Weir, 2023; Mayo Clinic Staff, 2023).

However, the risks remain substantial. Unverified dietary advice and promotion of extreme diets—often disguised as “detox” or “cleansing”—are widespread. Such content may lead to unhealthy behaviors, body dissatisfaction, and the development of eating disorders (Xu et al., 2024). Eating disorders, including anorexia nervosa, bulimia nervosa, binge eating disorder, and orthorexia, represent serious mental health conditions with physical and psychological consequences (Papežová, 2010; Koven & Abry, 2015; McGregor, 2019). These disorders are characterized by distorted body image, rigid control over food intake, or recurrent binge–purge cycles, and are often associated with social withdrawal, anxiety, and impulsivity (Krch, 2016; Koutek & Kocourková, 2024).

In addition to disordered eating, obesity is another negative outcome associated with social media use. Beyond sedentary behavior, adolescents are frequently exposed to digital marketing of energy-dense foods high in sugar, fat, and salt. Fast-food companies target young audiences through interactive content and contests, normalizing unhealthy consumption patterns (Strasburger et al., 2011; Dunlop et al., 2016).

OBJECTIVE

The objective of this study is to examine how social media influences the dietary habits of adolescents, with particular attention to both beneficial and adverse effects. Specifically, we investigate whether nutrition- and health-related content on platforms such as Instagram, TikTok, and Snapchat affects adolescents’ food choices and overall attitudes toward nutrition.

We hypothesize that adolescents are repeatedly exposed to nutrition and lifestyle content on social media and that such exposure influences their everyday dietary decisions. Furthermore, we expect that adolescents predominantly perceive this influence as negative, particularly due to the promotion of unrealistic body ideals and potentially harmful dietary practices. Finally, we anticipate that the majority of adolescents do not verify nutrition-related information obtained online through professional or evidence-based sources.

This study aims to provide a comprehensive understanding of the role social media plays in shaping adolescent eating behavior, highlighting both its potential to promote healthy lifestyles and the risks associated with misinformation and disordered eating.

METHODOLOGY

Participants

A total of 356 adolescents (aged 15–19 years) were initially recruited. Twelve questionnaires were excluded due to age criteria, resulting in 344 valid responses. The final sample consisted of 73.5% females and 26.5% males. The higher representation of female participants reflects the fact that nutrition-related social media content is more frequently followed by women, particularly adolescent girls, a trend also noted in previous research (Bärebring et al., 2020; Amson et al., 2025). While this provides valuable insights into gendered perspectives, it also represents a limitation of the study due to the unequal gender distribution typical of secondary school populations.

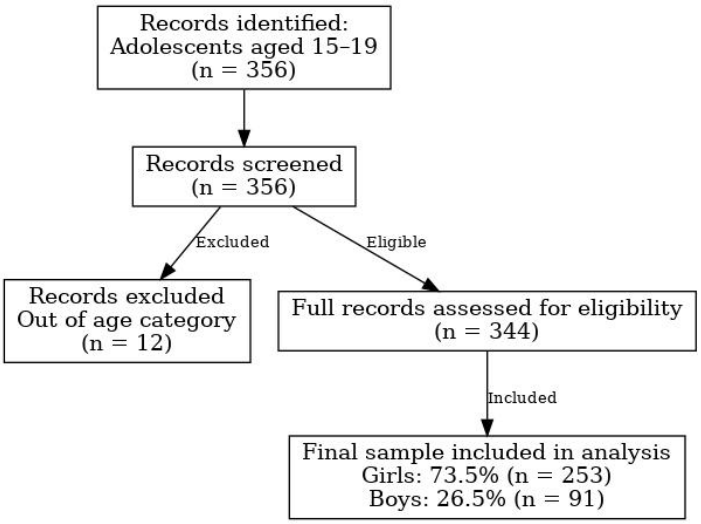

Figure 1 Flow diagram of participant recruitment and inclusion.

Study Design and Data Collection

A quantitative, cross-sectional design was applied using an anonymous online questionnaire (Google Forms). Data collection was conducted between November 1, 2024, and January 31, 2025. Participants were recruited through social media and personal networks to obtain a broad sample of adolescents actively engaged with social media content.

The questionnaire consisted of 27 items, including conditional branching questions, and required approximately six minutes to complete. Items were organized into four domains: (1) demographic information (age, sex, school grade); (2) dietary habits and lifestyle factors; (3) influence of social media on food choices and trust in online nutrition content; and (4) self-perception and body image in relation to social media exposure.

Data Analysis

Responses were processed using Microsoft Excel. Descriptive statistics were applied, with outcomes presented in absolute frequencies and percentages. The *COUNTIF* function was used to calculate response distributions. Data are reported in tables and figures and interpreted in comparison with relevant literature and current nutritional guidelines.

Ethical Considerations

The study was conducted in accordance with the ethical standards of the Declaration of Helsinki. Participation was voluntary and fully anonymous, with no identifying information collected. Prior to participation, all respondents were informed about the purpose of the study and gave their consent by proceeding with the online questionnaire. The study protocol was reviewed and approved by the Ethics Committee of the College of Physical Education and Sport Palestra (VŠTVS Palestra).

RESULTS AND DISCUSSION

The results demonstrate that social media plays a substantial role in the lives of adolescents, including their dietary behaviors.

Consistent with our first hypothesis, the majority of respondents (74.8 %) reported following nutrition- or fitness-related content on social media at least several times per month, while only 9.9 % never engage with such content. Instagram (43 %) and TikTok (35.5 %) were identified as the primary platforms for this type of content, with YouTube (18.7 %) playing a secondary role. Most respondents reported following influencers (55.4 %) rather than certified experts (28.6 %), reflecting findings from previous studies suggesting that adolescents view social media as a major source of lifestyle information (Pipová et al., 2021)
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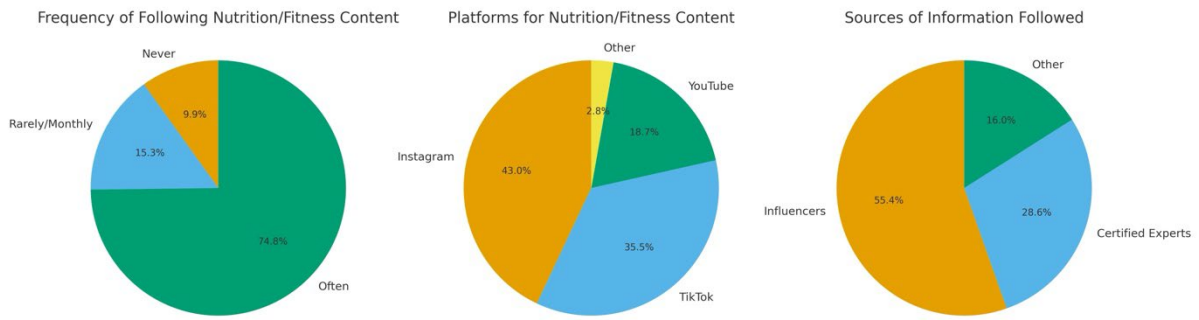

Figure 2 Adolescents' engagement with nutrition- and fitness-related social media content: Frequency of following, preferred platforms, and types of sources.

Regarding the second hypothesis, nearly half of respondents (44.8 %) acknowledged that social media influences their dietary choices, and 41.9 % reported actively changing their eating behavior based on online content. Most of these changes were health-promoting, such as increased consumption of fruits and vegetables or reduction of unhealthy foods (34.6 % and 26.9 %, respectively). However, 17 % reported risky behaviors, including restrictive dieting and feelings of guilt related to food. This duality mirrors earlier findings that adolescent girls, in particular, are vulnerable to the negative impact of online fitness and diet content (Choukas-Bradley et al., 2022).

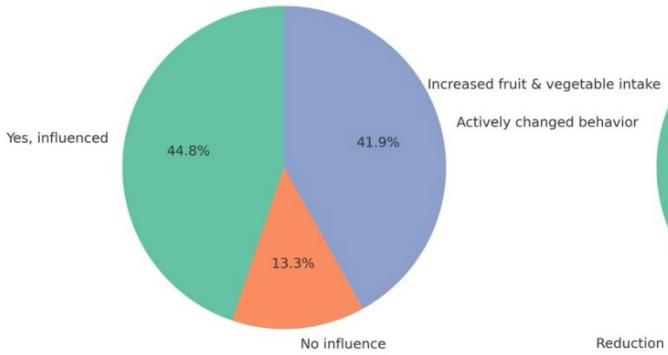

Figure 3a Influence of social media on adolescents' dietary choices.

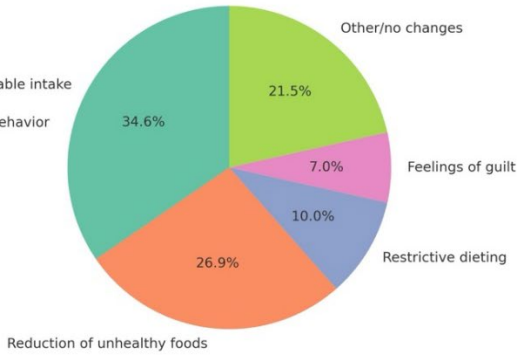

Figure 3b Behavioral changes based on nutrition-related social media content.

Our third hypothesis—that adolescents perceive the influence of social media on nutrition as predominantly negative—was not supported. The majority reported a neutral (58.4 %) or positive (31.9 %) effect, while only 9.7 % indicated a negative perception. These findings diverge from earlier studies highlighting the risks of exposure to dietary content (Mabe et al., 2014; Turner & Lefevre, 2017), but align with more recent evidence suggesting that social media can also inspire healthier lifestyles (Weir, 2023; Mayo Clinic Staff, 2023). Nevertheless, responses indicate that nearly half of participants (47.4 %) feel pressured by body ideals presented online, 68.7 % compare themselves to others, and 59 % report that social media worsened their relationship with food or body image at least to some extent. Such results underline the ambivalent nature of social media influence, combining elements of inspiration with risks of body dissatisfaction and disordered eating (Koven & Abry, 2015; McGregor, 2019).

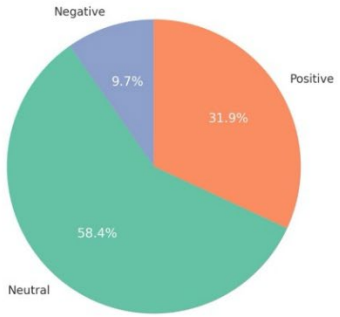

Figure 4a Perceived Influence of Social Media on Nutrition.

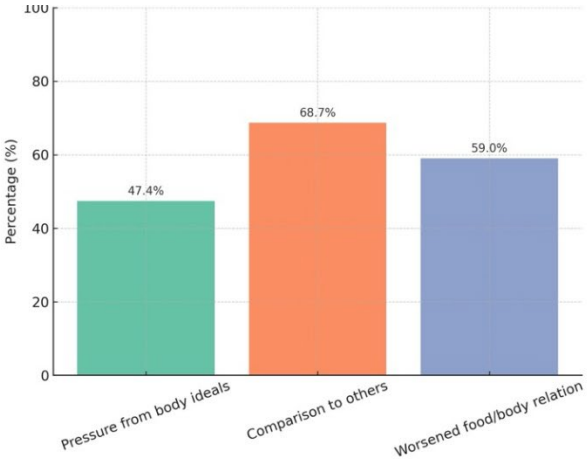

Figure 4b Reported Psychological Impacts of Social Media.

The fourth hypothesis, predicting that two-thirds of adolescents would not verify online nutrition information, was not supported. On the contrary, 67.7 % reported fact-checking such information outside of social media, and 52.3 % reported following accounts providing verified content. However, most participants rated the credibility of social media nutrition information as only “moderate” (64.2 %). These findings suggest some progress in adolescents’ media literacy, yet there is still significant room for improvement. A systematic review by Denniss et al. (2023) found that nearly half of the studies assessing online nutrition information rated it as poor quality or inaccurate—48.8% for websites and about 50% for social media content. The review further noted that the publisher of information is not a reliable indicator of its accuracy, even though consumers often use it as a marker of credibility. This reliance increases the risk of being misinformed when seeking nutrition information online. Consequently, the authors highlight the need to strengthen both media literacy and eHealth literacy to reduce the potential harms caused by nutrition- and health-related misinformation.

Overall, the findings reveal that social media exerts a strong and multifaceted influence on adolescent dietary behavior. While it provides motivation and inspiration for healthier eating, it simultaneously introduces risks associated with unrealistic body ideals, disordered eating patterns, and exposure to potentially unreliable information.

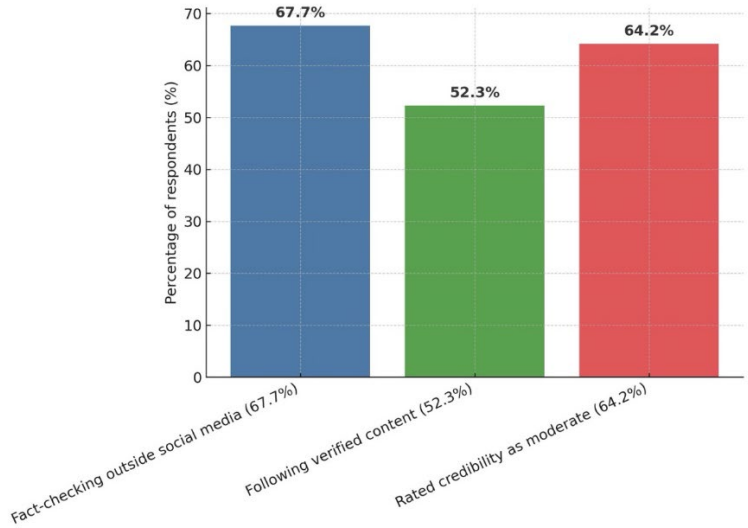

Figure 5 Credibility and Verification of Social Media Nutrition Information.

CONCLUSIONS

The present study investigated the influence of social media on the dietary habits of adolescents. Results indicate that social media represents not only a source of entertainment but also an important channel for nutrition-related information. The majority of adolescents are regularly exposed to dietary and lifestyle content, with Instagram and TikTok emerging as the dominant platforms. More than half of respondents reported that such content helped them improve their eating habits, and 41.9 % stated that they had modified their diet based on what they encountered online.

These findings partially support the hypothesis that social media shapes everyday dietary decision-making. While positive effects were frequently reported—such as increased fruit and vegetable intake or reduced consumption of unhealthy foods—negative outcomes were also evident. Respondents described restrictive eating, feelings of guilt, and symptoms associated with disordered eating, particularly in the context of body image pressures and peer comparison. Notably, nearly 69 % of adolescents admitted to comparing themselves with others on social media, and 59 % indicated that these comparisons negatively influenced their relationship with food or body image.

Contrary to expectations, the majority of adolescents demonstrated a degree of critical evaluation of online information. More than two-thirds reported verifying nutrition-related content outside social media, and over half followed accounts with verified or expert-based information. Nevertheless, perceived trustworthiness of such content remained only moderate, suggesting both cautious engagement and the continuing need to strengthen media literacy and critical thinking skills.

Overall, the study highlights the dual nature of social media influence: while it can inspire healthier dietary practices, it also presents risks related to misinformation, unrealistic ideals, and maladaptive eating behaviors. These findings underline the importance of integrating media literacy and nutrition education into school curricula to foster informed decision-making among adolescents. Future research should further explore how different types of content affect subgroups of adolescents, particularly with respect to gender differences, and how targeted interventions might mitigate risks while supporting the positive potential of social media for health promotion.

IMPLICATIONS FOR PRACTICE

Schools

Given the widespread influence of social media on adolescent dietary behaviors, schools represent a key environment for preventive interventions. Integrating topics such as media literacy, critical evaluation of online nutrition content, and body image resilience into subjects like health education or civics could help students navigate the digital environment more responsibly. Interactive lessons, project-based activities, and peer discussions may foster awareness of both the benefits and risks of social media use.

Parents

Parental involvement plays an essential role in shaping adolescents' attitudes toward nutrition and online content. Parents should be encouraged to discuss with their children the credibility of dietary information found online, model balanced eating habits, and provide a supportive environment that reduces appearance-related pressures. Open communication may mitigate the negative influence of unrealistic body ideals promoted on social media and reinforce healthier decision-making.

Health and Nutrition Professionals

For health practitioners, including nutritionists, psychologists, and pediatricians, the findings highlight the importance of addressing social media use during consultations with adolescents. Professionals should be aware of the dual impact of online dietary content—both motivating and potentially harmful—and guide young people toward evidence-based sources of information. Collaborative initiatives between experts and schools, as well as educational campaigns on social media, could amplify accurate information and counteract misinformation.

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I'M GOING TO BE A PSYCHOLOGIST – A QUALITATIVE STUDY OF PSYCHOLOGY STUDENTS ON LAY PSYCHOLOGY AND LAY COUNSELLING

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Abstract

Lay psychology is a common part of everyday interpersonal life. Psychology students encounter it not only as recipients but also as informal providers of psychological support. Exploring these experiences offers valuable insights into how students perceive the boundaries between lay and professional help and how these experiences contribute to the formation of their professional identity. A total of 191 undergraduate psychology students participated in a qualitative study using a non-standardized questionnaire with five open-ended questions. The responses were analysed using reflexive thematic analysis, with the aim of capturing students' personal experiences and reflections on lay counselling. Students demonstrated a high degree of ethical awareness, recognized the limits of their competence, and were able to identify situations in which professional help should be recommended. They viewed lay helping as a meaningful context for developing key counselling skills, such as empathy, active listening, and respect for the autonomy of others. Findings suggest that lay counselling provides a natural space for learning helping competencies. It may be understood as an initial step towards professional psychological practice, where ethical sensitivity and responsibility for psychological support begin to emerge. Psychology education should reflect these experiences and support students in learning how to respond safely and ethically when placed in informal helping roles.

Keywords

psychology student; informal help; professional role formation; ethical sensitivity

INTRODUCTION

Scientific and Lay Psychology

Psychology is a science that examines human experience, behaviour and mental processes with the aim of describing, explaining, predicting, and, when appropriate, influencing these aspects of human psychology. It does so through theoretical models, empirical methods and systematic research. Scientific psychology relies on verifiable data, standardised tools and is grounded in critical thinking, scientific methodology and ethical principles *American Psychological Association* (APA, 2017). It is divided into specialised fields such as cognitive, developmental, social, clinical and educational psychology. The outcomes of scientific psychology have practical applications in the training of professional psychologists for various areas of social practice and also serve related disciplines such as education, medicine and sociology.

In addition to scientific psychology, there is also something called lay psychology: a natural part of everyday life. People form their own ideas about emotions, relationships, motivation or parenting; they interpret their own behaviour as well as the behaviour of others, and they offer advice in difficult situations. These intuitive or culturally shared beliefs influence their decisions and behaviour. Lay psychology creates a framework through which people perceive themselves and others, even before coming into contact with professional psychological help.

Psychological phenomena, however, are not always interpreted correctly, as evidenced by the widespread presence of psychological myths (Lilienfeld, 2011), which are rooted in intuitive thinking and reinforced by the media. These myths can hinder critical thinking and perpetuate stereotypes, for example, about mental illness (Rodríguez-Prada, Orgaz, & Cubillas, 2022; Zhang &Firdaus, 2024). A study carried out by Poláková & Přikrylová Kučerová (2023) shows that misconceptions about schizophrenia, such as the belief that it

is untreatable or inherently linked to violence, persist even among university students. Myths also appear within scientific psychology itself, as highlighted by the *New Psychology in the 21st Century* project at Masaryk University (Vybíral, Cígler, & Šerek, 2022), which aims to promote evidence-based knowledge in psychology education.

Lay Psychology and Lay Counselling

Lay psychology can be distinguished from lay counselling and even though neither is professionally institutionalised, both play an important role in everyday life and often serve as a first step toward professional psychological help.

Lay psychology (folk psychology, implicit theories, pop psychology) includes common ideas on how the human mind, behaviour and interpersonal relationships work. Rather than drawing on scientific data, it is based on cultural narratives, personal experience and social context (Furnham, 1988; Griffiths, 1995; Sedláková, 2000). It helps individuals make sense of the world and evaluate themselves as well as others. These beliefs influence prejudice, religion, health, free will and morality. They are often intuitive, automatic and not organised into rational structures (Zedelius, Müller, & Schooler, 2017). Everyone makes use of them: parents, friends and social media users alike. The strength of lay psychology lies in its accessibility and cultural grounding; however, its weakness may be oversimplification or the propagation of prejudice.

The media plays a significant role in influencing lay psychology. Although it popularises psychology and contributes to the destigmatisation of mental illness, it often oversimplifies information or presents pseudoscientific conclusions (Lilienfeld, 2012; Vybíral, 2010). The media also sometimes bolsters the reputation of non-experts with media influence who provide distorted or outdated information. This poses a challenge for professionals to actively engage in public discourse and contribute to improving psychological literacy in society.

Lay counselling is an informal effort to help someone facing a difficult situation. Unlike professional counselling, it lacks formal methodology, education and an ethical framework, yet it can still be very valuable (L'Abate, 2005). It represents a natural complement to professional help – close relationships often support and motivate recovery; informal support from family and friends can both precede and accompany professional intervention (Lauzier-Jobin & Houle, 2022). The presence of a supportive social network is important, as it influences the client's motivation and treatment outcomes.

The foundation of lay counselling is a close and confidential relationship among friends, within the family, religious communities or charity organizations. The main tools include empathy, listening, sharing experiences and offering simple strategies. The lay counsellor draws on their own life experience, common sense and belief system. It can have a calming, supportive and activating effect.

Reasons and Motivation for Lay Counselling

Lay psychology and lay counselling are based on the natural human need to understand oneself and others. Everyone doesn't have access to professional help whether due to financial, geographic or cultural reasons. Close relationships in and of themselves also support good health overall and act as prevention.

In day-to-day life, lay psychology serves as a framework for interpreting experiences ("I have anxiety," "I'm stressed"), for seeking causes and solutions. In times of crisis, it activates lay counsellors, individuals willing to listen and support others.

During the COVID-19 pandemic, the importance of accessible sources of information increased – Wikipedia, for example, became a widely used medium. A study by Ciechanowski et al. (2024) showed that people searched for information on stress, mental health and defence mechanisms. Interest in traditional expert topics (such as burnout syndrome) significantly declined, which was related to a decrease in educational activities. In this context, Wikipedia functioned as a mirror of societal moods or other platforms, such as Facebook or Twitter could also be explored in this respect.

Lay counsellors play an important role in communities with low education levels or limited services. However, as Kagee (2020) points out, there is a lack of tools for their selection and a lack of research into what influences the quality of the help they provide (e.g. personality traits, training opportunities).

Professional Help Follows Lay Support

Ideally, lay counselling can serve as an entry point to professional help – providing stability and motivation to seek out a professional. The transition is smoother when lay counsellors are aware of their own competencies and are not afraid to recommend further steps. Professionals should inquire about the client's previous experiences with lay support and engage with them ethically, emphasising informed consent and respecting the boundaries of their own expertise (Garzon, Worthington Jr., Siang-Yang Tan, & Worthington, 2009). However, lay support can also be effective as evidenced by a meta-analysis of randomised studies (Connolly et al., 2021), trained lay counsellors in low- and middle-income countries contributed to significant improvements in clients' mental health across various contexts.

A particular dilemma concerns the role of professionals when it comes to helping those close to them – should they offer help if asked? The answer depends on careful self-reflection, clear boundary-setting and adherence to ethical principles. While professionals may be viewed as authorities, in personal relationships they should prioritise offering empathy over formal intervention.

Study objectives

The aim of this study is to explore psychology students' experiences with lay psychology, their understanding, as well as their reflections on its benefits and limitations. Lay psychology is a common part of human relationships, and it is important for future psychologists to reflect on it, both as a foundational framework used by clients and as a personal experience. Psychology students often act as informal counsellors to their close ones even before obtaining professional qualifications. In practice, they may also encounter clients who have previously sought help from laypersons, spiritual advisors or informal counsellors — experiences that can be both supportive and problematic. Awareness of lay psychology is therefore essential for building professional identity and for understanding the context of psychological work carried out by psychology students, future psychologists.

Research questions

- What experiences do psychology students have with lay psychology: either as recipients or providers of lay support?
- How do students view principles and limitations of lay counselling?
- What expectations do others place on them regarding the provision of psychological support?

METHODOLOGY

Participants

The study was conducted in cooperation with undergraduate students of the *Psychology program* at one of the faculties of *Charles University*. The programme is accredited in accordance with the requirements of the *Czech Ministry of Education, Youth and Sports* (2024) and EuroPsy (*The European Standard and Certificate in Psychology*). It provides a theoretical foundation for the subsequent professionally oriented master's program, which in the Czech Republic is considered *generic*, meaning it prepares students for all areas of psychological practice. In some fields, this is followed by mandatory postgraduate training (e.g. clinical psychology, traffic psychology).

The research was conducted between 2021 and 2025 as part of the course *Introduction to Counselling*, across five cohorts. The course had two versions based on accreditation requirements, it was offered in the 3rd year in the original version (2021) and in the 2nd year in the revised version (2022–2025). The selection process was intentional; it only included psychology students for whom the course was mandatory. Students from other programmes did not participate in the study. Participation was voluntary. Students were informed about the study's aim, the anonymity of their responses and their right to withdraw at any time. They were made aware of the opportunity to participate before the course

began. The purpose of the research and the method of data handling were clearly communicated, and no identifying information was collected. The principles of anonymity and voluntary participation were strictly upheld, including the right to withdraw at any time or refrain from submitting the questionnaire. The results of the study were presented during a seminar on lay psychology and lay counselling. This reflection was conducted anonymously in the form of generalised findings. Out of 266 enrolled students (227 women, 39 men), 191 respondents completed the questionnaire (72%). The gender ratio reflects the long-standing predominance of women in the field. The relatively high average age of respondents (see Table 1) is influenced by the competitive nature of the admissions process (with a success rate of approximately 1 in 20) and repeated applications, including from candidates who already hold a university degree. This is also reflected in the age maximums observed in the 2nd year: 39 years for women and 30 years for men.

Table 1. Sample – no. of responses obtained from respondents

	quantity (%)	% of women/men from the total number in the given cohort	average age/SD	min	max
total	191	71,8	22,7 / 2,8	21	39
men	27	69,2	23,3 / 3,1	21	30
women	164	72,2	22,1 / 2,4	21	39

Description of the method

A non-standardised questionnaire was developed for the purposes of this study. It consisted of five open-ended questions focused on experiences with lay psychology. The survey was conducted each year during the summer semester of the respective academic year and was administered electronically via Google Forms. Once data was collected, responses were exported into MS Excel spreadsheets and sorted by the date of submission, each respondent was assigned a specific row in the Excel file. This numerical designation is used when citing specific student responses.

Data processing

The study was qualitative in nature. Reflexive thematic analysis was used to analyse the responses to the open-ended questionnaire items, following Braun & Clarke (2006, 2021). This approach emphasises the active role of the researcher in generating themes and identifying patterns of meaning.

The analysis was conducted in the following six steps, which are the standard:

1. initial review of the data (repeated reading and note entry),
2. open coding (identification of relevant units),
3. searching for themes (grouping codes into categories),
4. revision of themes (consistency, selecting responses for illustration),
5. terms and definitions of themes,
6. preparation of the final report.

Furthermore, the frequencies of codes within each category were quantified, providing an indicative overview of the prevalence of themes and the identification of common patterns in the responses.

RESULTS

Psychology students seeking help

The first question focused on respondents' experiences of seeking lay help. A total of 190 students answered this question (one student did not respond). Through careful reading and open coding, 390 codes were identified from 178 student responses. These codes were grouped into four main categories: a) reasons

for seeking help (N = 101), b) whom students approached most often (N = 87), c) what they expected from these individuals (N = 73), and d) how they felt when seeking help (N = 34). Multiple codes could appear in a single response (i.e. it was impossible to assign a response to only one code). The remaining responses were very general (e.g. *Occasionally I turned to someone for something, I've experienced similar situations where I didn't know what to do, I think it's natural that everyone finds themselves in situations requiring advice from time to time*) or, in 23 cases (12%), students skipped this question and moved on to the next one, which focused on their experiences providing lay help to others (N=23, 12%).

a) Reasons for seeking lay support in terms of the themes addressed
Respondents most frequently reported seeking help from others regarding issues in romantic relationships (N = 32), including conflicts, breakups, infidelity or relationship insecurities. Other common reasons included difficulties related to school and studies (N = 24, e.g. stress from final exams, rescheduling exams, continuing education), family problems (N = 10, such as conflicts, new roles, child-rearing), health issues (N = 11, e.g. sleep problems, increased frequency of illness), and the loss of a close person (N = 5). Additionally, some respondents mentioned feelings of sadness, uncertainty, anxiety, the need to make a decision, or questioning their self-worth (N = 10).

These results show that students often seek lay support in situations which are difficult emotionally as well as inter-personally where students seek calm, support, information or validation. *I personally use lay support also mainly for relationship issues. It's always important to me what my friends who know me well think about a given situation. (R75) I personally experienced several major crises in my romantic relationships, and I always turned to my closest girlfriends for support. I often wasn't sure whether the conflict was my fault or not and a third-party opinion helped me a lot. I was able to see the situation from a new perspective and could assess my behaviour better and then act accordingly in resolving the matter. (R70) I was extremely nervous before my final exams and was scared I would fail. I needed to talk to someone who would support me and help me calm down. It helped me when I could speak with a friend who'd already been through it. (R18)*

Only a small number of responses (N = 8) did not confirm the use of lay support. However, some statements related to areas outside psychology were also reported. In situations where respondents lacked sufficient experience in a particular area of life (e.g., financial matters), they also turned to others for advice – typically practical life situations that were new or unfamiliar to them (N = 12, e.g. moving, purchasing electronics, legal advice). *Almost never. I prefer dealing with my problems on my own. It's not always good since it would be better to talk through some things, to say them out loud, but unfortunately my reserved nature doesn't really allow me to do that. (R42) A friend of mine, it was regarding a loan on my boyfriend's car. I picked her because I see her as someone very close to me, I trust her and I know that we usually have the same opinion and can come up with a solution together. (R27)*

b) Who did the student approach most often
Most often, respondents turned to friends (N = 47), followed by romantic partners (N = 38), individuals with some type of experience in psychology (N = 32), family members (parents, mother, sibling, father, grandparents, N = 13), or someone who had gone through a similar experience (N = 8). There was no indication that students sought help from other adults, such as teachers, parents' friends, etc.

I basically have a "system" of three people close to me who I turn to for lay advice. One friend who gives me a very down-to-earth, often judging, but honest view, something like "he's an idiot" or "you're overthinking it." Another very close friend, a psychology student at another faculty, who isn't really a layperson and knows better what to ask, how to assess, validate, and whether to give her opinion. And my partner who I've taught that there's no such thing as a right answer, that it's enough to just listen, not make light of the situation and provide support. I choose among them depending on what I need. (R9) One of my closest people is my husband. It is with him I discuss what's bothering me, of what I'm not sure. It helps me when I can

share what troubles me with him and he gives me his opinion. He also sees me as support and a confidant. (R18)

Counselling through social media was mentioned in three responses. Despite the rapid growth of online counselling, this option was chosen by relatively few respondents. This can be interpreted to mean that personal contact remains important even in lay counselling. When students seek information online, they do not assign it the same weight as they do to personal interactions. *I personally probably receive lay counselling mainly on social networks and mental health websites but they're not always the work of a professional. I let myself be inspired by an interesting approach/idea or I just get a new perspective that others are also going through the same thing. (R114)*

When students choose whom to turn to, closeness, trust and feeling secure about sharing all play a role, they also expect understanding and a certain level of professional or experiential competence. *Most recently a friend who I knew had a similar experience with someone close to her with serious psychological problems; when you meet people with psychological issues e.g. during training or with someone not as close it's very different from a situation when such persons are those closest to you, e.g. in your family, I chose this friend because I knew she'd be familiar with similar feelings that I was experiencing. (R9)*

Students also realise that different people are suited for different types of themes. The choice of a lay counsellor is therefore often a deliberate and well-thought-out act; some of the respondents spoke of a "specialist" in their circles. *I rely on my loved ones for advice, depending on the issue. Everyone for something else. I choose one person when I need advice on my relationships and someone else when I need something related to school or work. (R109)*

c) What the students expected from them
Students most often expected a specific piece of advice or an opinion from the person they approached (N = 40), followed by listening and the opportunity to confide in someone (N = 22), a sense of safety and trust, emotional support or reassurance (N = 20). Less frequently, they sought a different perspective (N = 10) or a mirroring of their situation (N = 5). This suggests that even when aware of the person's "non-expert" status, respondents still seek a psychologically meaningful response from those close to them, often a combination of support, opinion and acceptance. *I found a lay counsellor when I needed a different point of view on an issue I was dealing with. I was interested in how other people would perceive the problem but more than anything, it broadened my perspective rather than leading me to follow their advice. (R26) The day before my final exams, I was really on edge, and more than advice, I needed someone to ground me so I wouldn't fall into complete despair. So, I opened up to my brother, who was also taking his finals at the time. We comforted each other and it was very encouraging. I didn't get specific advice but a sense of reassurance, that we're never truly alone. (R5)*

d) How the students felt while they were receiving lay support
Several responses related to describing feelings when facing difficulties or challenges. Respondents described going through a crisis or dealing with a serious problem (N = 22), being under stress (N = 10), facing a difficult decision (N = 6) or lacking essential information (N = 7). In several responses, it was also mentioned that this was the first step before seeking professional psychological counselling. *I constantly discuss my feelings and worries with those around me. It helps me to talk about things; it helps me to make sense of my thoughts. I discuss issues related to my studies and career with friends who have more experience. Their advice is usually very helpful, and I try to follow it. (R185)*

Respondents distinguish between lay and professional help and make their choice based on the level of support, sense of safety or perceived competence. Lay counselling is therefore not random but deliberate and considered. It is important for students to be aware of their role as a source of support in relationships, as well as the influence these experiences may have on their future professional identity.

Respondents are aware of the difference

between lay and professional help and choose their confidants based on whether they need honesty, understanding or a safe space to share. Lay counselling is thus not random but deliberate and adapted to the individual's needs. It is perceived as a relevant form of sharing with high emotional significance. For their future professional practice, it is important that students recognise their role not only as future professionals but also as a natural source of support for those around them.

Psychology students give guidance and other forms of support to others

The second question focused on the provision of lay support by psychology students. A total of 190 responses were collected (one respondent did not answer), which were subjected to qualitative analysis. Through careful reading and open coding, 350 codes were identified from 168 students. The categorisation of responses includes codes related to: a) people to whom lay counselling was provided (N=90), b) themes most frequently discussed with psychology students, on which they were expected to provide answers (N=28), c) the approach applied by the students (N=16), and d) the feelings experienced in this role (N=15). For 22 students, the responses were very general (*A person close to me, I do it often, I have provided some form of lay support a few times*), without further specification. In most cases, multiple codes were identified in the answers, falling into several categories. Summary of key findings:

a) Approaching a psychology student with a request for an opinion or help

Psychology students were most often approached by friends (N=62), followed by romantic partners (N=35), people currently studying psychology or another university program (N=22, e.g. other students), less often family members (N=20) or someone dealing with a problem or issue that the student has experience with (N=10). Some students also offered presumed reasons in their responses as to why certain people turned to them specifically, for example, that they likely trust them, value their experience, or see them as being empathetic. An important factor for those around them, as shown in the responses, was the fact that they study psychology and are therefore considered to be familiar with people's problems and how to deal with them. *I've provided lay counselling a few times in one way or another. For example, to a friend of mine who's been coming to me for advice on his relationship(s) and I happily return the favour. Basically, it's problems relating to a relationship that had recently ended and now there was the possibility to start a new relationship, which is quite complicated. (R29)*

b) Themes and situations where students acted as advisors

The most frequent topics concerned relationship issues, followed by personal problems (N=33), academic matters (N=38), family problems (N=38) and career decision-making (N=29). A significant portion of the responses fell into general or vague cases (N=43), which may be due to the diversity and vagueness of some of the answers.

Relationships (N=84): Many respondents were approached regarding problems in relationships, be it romantic relationships or relationships within the family or among friends. Sometimes it was a very detailed description of a situation. *Yes, it usually relates to interpersonal relationships. I try to listen and maybe offer my point of view, but I always try to reiterate that everyone's different and what I say doesn't necessarily have to suit the other person's needs. (R46) I was approached several times by my friend to give him advice on relationships (after a breakup with a girlfriend) and later also about a lack of motivation and a general dissatisfaction in life… (R41)*

Studying and academics (N=38): Some respondents were approached with advice regarding studying, preparing for exams or choosing a school. *I was approached to give advice on study techniques. I was happy to share what works for me while communicating that this doesn't have to suit everybody and I felt comfortable about that. I didn't know enough about other options, which is what that person probably needed – to try several different things – and that's why I referred them to other people about whom I knew used a different strategy as well as the internet, which is full of other recommendations and study tips. (R103)*

Other problems (N=33): Some respondents were approached regarding personal problems such as psychological issues, stress or a life crisis. *A friend of mine has a very anxious son and it's already happened several times that she's come to me with her worries over him. I always spoke to her and tried to be a good listener. I did have to remind her a few times that I'm just a psychology student and not a professional and referred her to get professional help. (R129)*

Work and career (N=19): Some respondents offered advice on work opportunities such as job selection, resolving workplace conflicts or handling career advancement. *A friend of mine came to me who was wondering whether to stay at her job, which was well paid but took up a lot of her time. Together, we considered ways to avoid extending her studies because of the demands of her job. (R55)*

c) Manner in which respondents handled giving advice

Respondents most frequently mentioned that they listened to the other person, offered support or comfort (N=34) or gave concrete advice (N=26). Some shared their own experience or offered a reflective perspective, providing different viewpoints and a broader understanding of the situation. Interestingly, 13 respondents mentioned that they referred the other person to a professional, which may indicate a healthy awareness of their own limitations in the role of a lay advisor.

I usually asked follow-up questions and tried to guide my friend through the conversation so that he could, ideally, come to the best solution himself. I also always tried to remain as objective as possible and to present the perspectives of the other side as well. Even though all those involved were my friends, I sometimes struggled to maintain neutrality. (R28) … I always tried to make time for our conversations so that we could talk at my place or his, somewhere quiet. I led the conversation in a non-directive way and mostly asked about details and his stance on the whole situation. (R41)

Listening and empathy: Most respondents emphasised the importance of listening and showing empathy towards the person who approached them. *First, I listened actively, expressed my support and asked what they would recommend to me if the situation were reversed… (R171)*

Sharing own experience: Many respondents shared their own experiences and opinions in order to help the other person better understand the situation. *I also gave him a few pieces of advice on how I would probably handle it. (R42)*

Offering different perspectives: Some respondents tried to offer different points of view on the problem and help the other person find the best possible solution. *I try to hear the other person out and give them my opinion, but I always try to emphasise that everyone's different and that what I think doesn't have to suit someone else. (R46)*

In cases where the problems were serious, the respondents recommended the other person seek professional help. *Yes, for example, my friend asked me how to act in his relationship with his girlfriend. Since he asked me "as a future psychologist" I pointed out that I'm not a psychologist yet, and I wouldn't want to be one for him at this point. That we can talk about it as friends, I can tell him how I see it but if he wants professional help, I can get him some contacts for professionals. (R55)*

The research data also contained responses that went beyond the scope of typical lay counselling and approached the level of more structured (educational) support. The use of a coaching approach based on active listening, asking questions and supporting the client's self-reflection; demonstrates a higher level of awareness, methodological practice and respect for the other person's autonomy. This form of support exceeds intuitive sharing of experiences and suggests that the students operate at a more advanced level of lay counselling. *It was usually a friendly conversation where someone came for advice. I tried to act as a coach and leave advice or my opinions as the last possible resort. I feel pretty confident in this role. If I feel like it's a topic that needs a more in-depth approach (e.g. psychotherapy), I recommend where they can go. (R161)*

d) Students' subjective experience in the role of advisor
Most responses did not explicitly mention this aspect (N=136). When respondents did comment on it, they often stated that they felt competent or good about it (N=39) and tried to be as helpful as possible. Only a small number felt uncertain or described ambivalent feelings, for example, a sense of exhaustion balanced out by the feeling of having provided help (N=16).

Feeling satisfied: Some respondents felt satisfaction and joy from being able to help and the trust the other person placed in them. *I felt good in this role, it was interesting to act as an advisor, and I was glad to be helpful and I'm actually always happy when I can take on this role. (R43)*

Feeling uncertain: Some respondents felt uncertain about whether their advice was correct and whether it was truly helpful. *I don't feel very comfortable in the role of an advisor right now, as I wouldn't want my influence to lead someone astray. I know I still need to gain a lot of knowledge and skills, and I want to approach this role with respect. (R41) And how do I feel in this role? I don't like it when someone wants me to tell them exactly what they should do, as that shifts the responsibility for the situation onto me. It also depends on the nature of the problem and how competent I feel in that particular area. On the other hand, I'm pleased when I can be there for others. I value being able to support them and that they trust me enough to confide in me. (R40)*

Feeling of exhaustion vs. needed help: Some respondents felt exhausted when the situations repeated themselves or were particularly demanding. *Most of the time, I managed and still manage to keep a certain distance and maintain perspective. As might be expected, it's not possible to maintain this all the time, and there were situations where I didn't feel comfortable. Most often, it was due to the pressure I felt to provide some all-solving advice, or because I could sense from my friend how poorly he was doing, and I didn't know how to help him… (R28)*

The analysis shows that lay counselling by students occurs naturally, predominantly in the field of interpersonal relationships. Respondents often take on a supportive role, are aware of the limits of their abilities and recommend professional help when needed. They perceive the role mostly positively, though sometimes with uncertainty about their competence. They are able to recognise situations that go beyond the scope of lay help. Their knowledge of the professional care system and the sensitive way they refer others to it make them responsible lay counsellors. Although the question was not aimed at counselling principles, some were mentioned in the responses.

Perceived principles of lay counselling among psychology students
The third question explored how psychology students understand the principles of lay counselling – that is, providing help without professional qualifications – and which principles they consider important to follow. The thematic analysis of responses (N=192) showed that the most frequently mentioned principles were listening, empathy, boundaries, avoiding giving direct advice and maintaining confidentiality. Most respondents mentioned several principles simultaneously.

a) Listening and empathy (N=88/N=34). Most students identified listening as a key component of lay counselling. They emphasised the importance of active, empathetic and non-judgmental listening, which in itself provides support and space for clarifying the problem. Students consider empathy essential for making the other person feel accepted and safe. They highlighted the ability to empathise without taking on the problem themselves. *Don't give advice but support finding a solution. Don't rush and allow them time. Don't be hurtful. Know your limits. Take care of yourself as well. Listen. Be a support. Be empathetic. Maintain confidentiality. (R1)*

b) Respecting your boundaries and your own competences (N=48). Students emphasised that their role is not to "solve" problems but to provide support when they feel prepared to do so (N=19). They warned against giving unsolicited advice (N=18) and recommended waiting until the other person explicitly asks for it, preferring to offer suggestions rather than direct instructions. They were aware that they are not professionals (N=8) and must not

present themselves as "psychologists" or "therapists," even if they possess knowledge from the field. *Know your limits = know in which areas we feel comfortable and in which we do not feel competent and communicate that to others. Don't take responsibility for another person's decision. Let the other person talk, listen attentively, offer an outside perspective, don't make decisions for them, leaving the final decision to them. (R70)*

c) Do no harm and refer to a specialist (N=23). It was also mentioned to be aware of the risks of a layperson's approach, for example, pressure, manipulation, insensitive comments or inadequate advice. Many pointed out that the principle is "do no harm" and not to create additional stress, and, if necessary, to refer the person to a professional with whom they can address their problem. *If I were to briefly summarise what I consider most important in terms of principles, I would emphasise above all that through our actions we should in no way cause harm or make the situation worse. (R15)*

d) Confidentiality and privacy. (N=11). The students emphasised the importance of maintaining confidentiality; even in a lay setting, it is necessary to respect the privacy of the person confiding in you. Although this principle was mentioned less frequently, it points to highly educated lay counsellors who are aware of their limits as well as basic ethical principles. Such an approach may represent a transition from the lay to the professional role, typical for psychology students. *For me, the main principles include listening, making an effort to understand how the other person feels, avoiding giving specific advice, showing interest in the desired state of the problem, not allowing oneself to be pressured into devising a "client's" problem-solving plan, mapping out possible solutions together with the other person, maintaining confidentiality (with limitations such as the duty to report and situations where the "client" or those close to them are at risk), referring the "client" to a professional if the problem is of a serious nature, not overestimating one's own abilities, and emphasising that what I say is my own opinion and not a universally valid guide. (R18)*

e) Respect for autonomy and support for self-directed solutions. (N=6). According to some students, a counsellor should support the person seeking help in finding their own solution, rather than imposing their own solution. The decision is the right of each individual, and the counsellor should respect it even if they personally disagree. *Let the other person express themselves and open up emotionally; it is neither necessary nor desirable to immediately seek a solution, and definitely not to take full control of the other person's situation. Focus on listening rather than speaking and show compassion. Rather, balance radical impulses and perspectives on the situation with possible views from the other side, and the need to consider things calmly and without emotional charge. (R33) Let the person talk about their problem and understand their situation. Do not tell the person what they must do, leave it up to them. (R85)*

f) Don't make light of the problem (N=5). A small but significant group pointed out the risk of trivialising the problem, phrases like "it's nothing" or "it will be alright", as a fundamental mistake in providing support.

Psychology students have a fairly advanced and ethically conscious view of the lay counsellor's role. Their responses emphasise listening, respect, not imposing oneself and especially an awareness of the limits of their own role. This reflects not only their professional training but also their awareness of the responsibility they may play, even in a lay capacity, in the lives of others.

Limitations of lay counselling through the eyes of psychology students

The task of the fourth question was to map how psychology students perceive the boundaries between lay help and professional intervention, and whether they are aware of possible risks and limits of their competence when providing help in an informal context. A total of 164 highly variable responses were obtained; 27 students did not answer. The following categories were identified (the frequency of codes appears in parentheses).

Lack of expertise and competence (N=35). Respondents pointed out that a layperson lacks the necessary knowledge and training

and therefore may not recognise the seriousness of a situation, may choose an inappropriate approach, or provide inaccurate advice. They also lack tools common in professional counselling, such as supervision, systematic self-reflection or the ability to maintain professional distance, which can lead to emotional bias and loss of objectivity. *A lay counsellor does not have sufficient expertise, is not educated in the given issue and may not engage in lifelong learning. (R10) … overall, an unprofessional approach due to the fact that, for example, I don't have professional training in crisis intervention, that I don't work under a supervisor, and so on. (R80)*

Power dynamics, directedness, manipulation (N=36). The theme of responsible handling of another's trust resonated strongly. Students mentioned risks where the counsellor unknowingly abuses their position of authority, is directive and imposes solutions, or takes control over the other person's decision-making. *Accepting the expert role (a lay counsellor usually cannot provide guidance as well as a professional expert, even though they may be, for example, more emotionally connected with the client, such as when the counsellor is a friend) and the related sense of importance, which can negatively influence the counselling relationship… (R80) A layperson lacks theoretical training, posing a risk of manipulation. (R118)*

Transferring one's own experiences, lack of self-reflection (N=29). Respondents warned of the danger that a layperson might project their own stories and solutions onto another person's situation without reflecting on the differences in experience and context. *Insufficient self-reflection, limited time, resulting in only superficial understanding, inadequate information and knowledge, and personal involvement in someone else's situation. (R75)*

Risk of poor or harmful advice (N=22). There was a fear of unprofessional advice that could worsen the situation, for example, downplaying the problem, trivialisation or misleading recommendations. *A lay counsellor's advice may be the best option from the counsellor's perspective, but this may not be the case for the person seeking help. On the contrary, the advice may harm them, and I would argue that the following rule applies here: everyone is an expert on their own life. (R58)*

Serious topics beyond the scope of lay counselling. (N=19). Students were aware that some situations (e.g. trauma, mental illness, self-harm) require professional intervention. A layperson may rather complicate the situation or be unable to manage the emotional burden. *The limitation lies precisely in those problematic situations that are serious enough to require professional intervention because a lay counsellor is insufficient. For example, when it concerns mental or physical health issues… (R49)*

Ethical limits and lack of knowledge of ethical principles (N=17). They mentioned, for example, breaches of confidentiality, disrespecting boundaries, unethical handling of sensitive information, or lack of responsibility. *A lay counsellor may not know the rules of ethics and may fail to respect that they should not discuss the problem with anyone else. (R11)*

Relational closeness, subjectivity and loss of distance. (N=14). Students mentioned that it is difficult to maintain objectivity when it concerns a person we care about (partner, sibling, etc.). A close relationship can distort perspective or make open communication more difficult. *Advice from a lay counsellor may not be neutral; when giving advice, the counsellor is prone to significant subjectivity. (R10)*

Overstepping the role "playing psychologist." (N=13). Respondents warned that the layperson should not take on the role of a therapist even if they have some knowledge or are studying psychology. *The difficulty of maintaining distance when it involves a close person. Feeling pressured to be an expert. A tendency to assert one's own truth. (R3)*

Lack of awareness of one's own limits. (N=13). Some respondents warned of the danger that a layperson may not admit when they are no longer sufficient and continue to provide help, even though they should rather refer to a professional. This can cause harm to themselves. *At first glance, it may seem*

that only the person needing help can be harmed but the counsellor is also at risk because the problems fall onto them. They may feel fully responsible for the other person or simply become too emotionally involved in the entire situation, which negatively affects their own well-being. Therefore, it is important to set their own boundaries as well. (R53)

Client dependency, unrealistic expectations (N=9). The possibility was also mentioned that a client may rely too much on a lay counsellor, leading to unhealthy dependency or delaying professional help. *The limitation is, of course, the non-expertise characteristic of lay counselling, since the counsellor is unlikely to be an expert on the given issue. Nevertheless, some 'clients' may place the counsellor in this position and demand more than just their subjective perspective. (R18)*

The students' responses show that they perceive lay counselling as useful but significantly limited. They are aware that even with good intentions, it can cause harm, especially when exceeding competencies, lacking emotional distance or intervening in serious mental conditions. Their reflection on responsibility and ethical sensitivity suggests they are capable of critically assessing the role they can and cannot play as non-professionals in supporting others.

Expectations placed on psychology students by others

The aim of the question was to find out how psychology students perceive the pressures, ideas and expectations of others (as well as their own) regarding their professional identity already during their studies. The thematic analysis of responses (N=192) revealed ten main categories that show how students reflect on their role in society.

a) Knowledge in the field of psychology and mental health. (N=64). Most often, they are expected to "know" whether it concerns emotions, relationships, behaviour or mental health in general. Others turn to them with the assumption that they have answers on hand, understand people and can explain every behaviour. *I often encounter the expectation that I should know exactly the causes of someone's behaviour. Several times, when I was introduced to someone for the first time and mentioned that I study psychology, the response was, "So now you're going to analyse me, right?" So there seems to be an expectation of a precise understanding of why someone behaves the way they do and that I know exactly what to do in various situations. (R59) That I will be an expert on interpersonal relationships and be able to diagnose people from a distance. (R36)*

b) Expectations of acquired expertise include the ability to listen and advise (N=40), analyse and solve problems (N=28), and competence to help or intervene (N=26). Students perceive pressure to be able to listen, calm others, be available and "know what to say." They are often expected to quickly understand the context, analyse the situation or evaluate behaviour, even though they do not yet have adequate tools for this. *That I will have a well-founded answer to everything related to human suffering and dilemmas. (R61) That I am already knowledgeable in many things and able to give advice. (R91)*

c) Unrealistic expectations (N=18). Students also encounter unrealistic expectations, where others attribute greater competencies than the students can actually hold. *Among people who do not understand the field well, expectations are unrealistic; it seems they attribute supernatural abilities to psychologists. (R23) Or that I no longer have my own problems because I study it. Many unrealistic ideas create pressure for me to be able to advise everyone. (R91)*

d) On the contrary, there was also a notable absence of expectations or minimisation of the role (N=21). Some students reported that nothing is expected of them and those close to them do not judge them through the lens of their studied field. Others encounter situations where their surroundings belittle psychology or do not believe in it. And others feel that no one takes their studies seriously or that it is questioned. *There is no pressure on me from those close to me regarding how I should act in my profession. They don't project what I study onto their expectations of my behaviour. (R137) My grandparents still don't really understand the whole concept, even though I often try to explain it to them. It seems to me they don't let the information in and prefer to stick to the mindset of "the good old days*

when people had work to do and didn't need psychologists." (R28)

e) Expectations relating to personal characteristics of psychology included both mental stability and resilience, as well as emotional closeness to others.

Mental resilience and stability (N=12). Part of the responses expressed the idea that a psychologist should be balanced, "always okay" and have everything sorted out, meaning that others expect this resilience already from the student. *…that I'm always going to be in a good mood, open and listen to everyone. (R125)*

Emotional closeness to others (N=2). Occasionally, there was an expectation that a psychology student should be prepared to bear the emotions of others. *Empathy, understanding people, emotional sensitivity. At the same time, I feel pressure to always know what to say and always have some advice. "I don't know" should not be part of my vocabulary. (R30)*

e) Ethical behaviour, self-control, be a role model (N=5). Some students noted that they are perceived as moral authorities, meaning they "should know what's right," not act impulsively etc. *…that I'll be something like a moral compass and never do anything inappropriate. (R4)*

f) Other and specific expectations (50 responses not included in previous categories). *They included, for example, funny comments, unclear statements or very specific messages (e.g. "That I will never be sad again," "That I will work in a counselling centre," "That I will earn a lot of money as a psychologist").*

Psychology students often feel that they are seen by others as someone who "should already know" and "be able to help," even though they are still in training for the profession. The responses reveal a tension between the student identity and the expectations of others. They reflect on exaggerated expectations (immediate help, psychological stability), the belittling of their role and the pressure to act "like psychologists." Some statements also concerned the expectation that they would handle other people's personal problems.

RESPONSES TO ESTABLISHED RESEARCH QUESTIONS

What experience do psychology students have with lay psychology – whether as recipients or providers of counselling?
Psychology students have extensive personal experience with lay psychology, both as recipients and providers of advice. As recipients, they most often turned to friends, partners or family, usually in situations related to romantic relationships, academic stress or personal crises. In these moments, they primarily expected understanding, support and the opportunity to share and less often concrete solutions.

In the role of providers, students are often spontaneously approached by people from their social circle who assume that, thanks to studying psychology, they have certain counselling or intervention skills. They thus face expectations that they know how to advise, listen, "explain something" or even "help." These experiences lead students to become aware not only of their own vulnerability but also of their responsibility in interpersonal communication.

The responses reveal sensitivity to where natural human support ends and where a professional should intervene. For them, lay psychology is thus not only a personal experience but also a space for reflecting on their professional role.

How do students perceive the principles and limitations of lay counselling?
Psychology students perceive lay counselling as a natural form of human help that has its place but also clear limits. The fundamental principles for them are primarily listening, empathy, a non-judgmental approach and respect for the other person. They also emphasise not imposing advice, not overstepping boundaries and being aware of their own competencies.

At the same time, they are aware of many limitations of lay help including the risk of

giving poor or harmful advice, confusion with professional assistance, manipulation or projecting their own experiences. They recognise that it is not always possible to help and that some situations require intervention by a professional.

Their responses demonstrate ethical sensitivity and the need to reflect on the role they can (and cannot) play in the lives of others. They understand lay counselling as an important but competence-limited part of interpersonal support.

What expectations do others place on them regarding the provision of psychological help?

The social circle of psychology students often places unrealistic or exaggerated expectations on their role. They are expected to possess expert knowledge, the ability to advise, handle others' difficult situations and be available as "little psychologists" even during their studies. They are frequently approached with requests to explain behaviour, solve relationship problems or provide emotional support.

Some students also perceive pressure to be mentally balanced, serve as a moral role model, or manage their own emotions without showing weakness. At the same time, some respondents report that their field is belittled or underestimated by others, or that nothing specific is expected from them.

These ambivalent expectations create a space for tension between what students can actually offer and what others think they should be able to handle. Experience shows the need to clearly communicate one's competencies but also to work with the boundaries between the role of a student and the role of a helper.

DISCUSSION

The role of lay counselling on the path to a professional psychologist

Rønnestad & Skovholt (2003) describe six stages of professional development for psychologists from lay helper to experienced expert. Most students are situated in the first stage, while some, according to their responses, are moving toward the level of an advanced student. Therefore, the research further examined whether and how students reflect on the relationship between lay psychology and the profession of psychology. Responses that were not categorised initially, were analysed during a second reading of the responses.

Personal experience as a basis for professional reflection: Students reported that their experience with lay counselling (both as recipients and providers) helped them understand the importance of empathy, trust and the necessity of respecting boundaries. The topic of lay counselling, included in their coursework, contributed to raising awareness of their own attitudes as well as their relationship to professional identity.

Awareness of limits and establishing boundaries: Students recognise that although help is expected from them, they are not yet professionals. They therefore view lay counselling as a space for practicing ethics, understanding their competencies and managing the expectations of others – a crucial step toward handling boundaries professionally.

The lay role as the beginning of a helping identity: Studying psychology is often perceived by others as a sign of the ability to help. Students thus spontaneously find themselves in the role of support and learn to distinguish between lay help and the need to refer to professionals.

Peer counselling as an intermediate step: Peer supervision can support professional growth even without direct guidance. The study conducted by Somerville, Marcus & Chang (2019) shows that volunteer activities of psychology students foster multicultural reflection and skills. Students in our research also participate in volunteer activities, which is confirmed by the study carried out by Kucharská et al. (2022). Peer support was further developed in the course Introduction to Counselling.

Ethical sensitivity as a connecting thread: Students demonstrate strong ethical awareness; they understand the limits of providing help, respect for others and responsibility for how they respond. They articulated principles similar to those outlined by Novák (2005), such as listening, not provoking affect,

recommending professional help and seeking a positive perspective. Other principles (e.g. humour as a defence mechanism) were not mentioned but this does not indicate lower ethical sensitivity.

How does the acquisition of key professional competencies take place?
Students acquire key helping skills such as listening, empathy and working with trust through both personal and academic experiences. At the same time, they become strongly aware of the necessity to respect their competence boundaries. This finding aligns with research on the professional identity development of future psychologists (e.g., Skovholt & Rønnestad, 2003), which emphasises that contact with external expectations and initial experiences with informal help represent an important formative moment.

A study focused on the formation of professional identity among university students (Reid et al., 2019) shows that even during their studies, students experience tension between external expectations and their actual level of preparedness, which naturally stimulates an awareness of professional responsibility. Our findings confirm this trend: students reflect not only on their capacity to help but also on the risks that may arise from unqualified intervention. In this sense, lay counselling can be seen as a "training ground" for helping professions, where fundamental ethical sensitivity, the need for self-reflection, and the ability to recognize and respect one's limitations are developed.

Just as the ethical code emphasizes that becoming a psychologist is not sufficient to ensure ethical conduct – ethical principles must be actively developed rather than assumed to occur naturally (Martináková, 2016). Students should also cultivate ethical awareness in their informal counselling roles during their studies. Ethics is not automatic; it requires education, reflection, and decision-making in specific contexts. This approach encourages the development of awareness regarding one's own competence boundaries, even when acting as a lay counsellor.

A parallel with ontogenetic development can be drawn here, where relationships are first formed through primary and only later secondary socialisation. Lay counselling, whether provided or received, primarily takes place among close individuals, such as partners, family members, friends or classmates. It has not been shown to be commonly offered to strangers. This pattern is also confirmed by other studies, which indicate that the most frequent providers of lay support are family members, friends and sometimes representatives of religious communities, where close bonds are formed.

Experience with a specific type of problem also plays a significant role in providing lay support. Some studies therefore focus on self-help groups, where people share their experiences with others who have gone through similar difficulties. Research further confirms that informal support from friends and family is often perceived by individuals as very beneficial and helpful (Jorm et al., 1997; Morgan et al., 2014).

What rules do psychology students set for the safe and ethical provision of advice and support to others?
The topic was discussed with students in seminars following the questionnaire survey. Various recommendations emerged in the discussion, which are listed in the appendix 1. In line with several studies (Somerville, Marcus, & Chang, 2019; Ahorsu et al., 2021) although this connection was not directly reflected in the questionnaire responses, the discussion also addressed the link between volunteering, peer counselling groups with supervision and the development of professional competencies.

Ethical aspects and limits of the research
The research was conducted in accordance with ethical standards for working with human participants and respected applicable national and international regulations, including the principles of *Ethical code of the Czech-Moravian Psychological Society* (2017) and *APA* (2017). These principles emphasise respect for the dignity of individuals, voluntary participation, protection of privacy and anonymity, transparency of the research purpose, and the possibility to withdraw from participation at any time without negative consequences.

Students were informed in advance about the purpose of the research, the way their responses would be processed and the measures to ensure anonymity. Participation was completely voluntary, without any personal identification, and respondents could withdraw from participation at any time. Nevertheless, a high response rate was achieved (191 out of 266 students, i.e., nearly 72%), which is above average for voluntary questionnaire surveys. This interest can be attributed both to the attractive topic and the subsequent use of the results in teaching.

However, it is necessary to consider the possible effect of self-regulation in selection. The participants were likely primarily students who were interested in the topic or those who had personal experience with lay counselling. Therefore, the results may reflect a specific subgroup of psychology students.

In the seminar following the research, the statements were presented in a generalised form, maintaining anonymity, which was particularly important because the students knew each other and there was a risk of identifying specific individuals based on their statements.

A limitation of the study is that it focused solely on students from a single study program, so the results cannot be generalised to all psychology students in the Czech Republic without further research. Another limitation is the gender imbalance; the majority were women, which, however, corresponds to the typical composition of the study group.

On the other hand, this approach allowed for targeted work with a specific group and provided a starting framework for further educational, professional and self-reflective development of students. The qualitative analysis of open responses offered a deeper insight into the individual experiences and perceptions of students regarding lay psychology, including reflections on risks, benefits and connections to their future professional identity. The results served as the basis for a seminar in which recommendations were developed on how students can proceed in this area (see appendix).

CONCLUSION

The results of the study show that psychology students commonly provide and receive lay support, and that these experiences play an important role in shaping their professional identity. Reflecting on personal boundaries, responsibility, and the limitations of non-professional support indicates that ethical sensitivity and the ability to distinguish between lay and professional roles begin to develop already during study. Lay counselling thus emerges not only as a natural part of interpersonal relationships but also as a meaningful “training ground” for acquiring key competencies of the future psychologist.

Students' responses highlight the value of personal contact, the importance of trust, and sensitivity to others’ needs. At the same time, they demonstrate awareness of the risks associated with unsolicited advice, blurred boundaries, or overestimating one’s competence. This perspective enriches not only the education of future professionals but also the broader discussion about the role of lay counselling in the field of mental health.

Recommendations for psychology education arise from the need to address lay psychology as a legitimate part of professional development. Integrating course components focused on ethical issues, boundaries of helping roles, volunteering, and peer support may encourage students’ self-reflection and strengthen their ability to respond appropriately to the expectations of others. Drawing on students' real-life experiences as a basis for discussion helps bridge theory and practice and supports the active formation of professional identity.

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Appendix 1

Recommendations of psychology students on practicing lay counselling

1. Be aware of your role – you're a student, not a professional
   - Admit it to yourself (and others) that you're still in training and you're not qualified to provide psychological counselling.
   - It's OK to say: *"It's great that you're confining in me but I'm not a professional. I'm happy to listen to you but someone with professional qualifications should help you find a solution."*
2. Listen like another human being, not a psychologist or therapist
   - Provide support – active listening, empathy, respect.
   - Do not analyse, do not interpret, do not diagnose.
   - Avoid sentences such as *"you're probably…", "you have that from your childhood…."*.
3. Avoid assuming responsibility for another person.
   - Don't promise to provide a solution or to save them.
   - Don't take on the expectation that you always have to be available, strong or that you'll *"fix it."*
4. Do not harm: avoid being directive and giving advice along the lines of: *"do it this way"*
   - Radicality, moralising or sharing own experiences can be harmful.
   - If you want to be helpful, formulate sentences like this: *"Some people consider…", "Perhaps it would be worth it to…"*
5. Consider when and how to recommend professional help
   - If the topic is serious (self-harm, trauma, mental illness), it's appropriate to offer contact information for a psychologist or an emergency service. You can say something like: *"What you're describing sounds like something that deserves professional attention. I'll help you find someone who would be appropriate."*
   - Learn about professional counselling services available in your local area
6. Take care of yourself and your boundaries
   - If the contact is mentally draining, it's perfectly fine to take a step back
   - Speak to your teachers, supervisors or colleagues – sharing is important.
   - Seek professional help if you're unable to distance yourself and the other person's problems have affected you more than you'd expect.
7. Do not underestimate the development of professional competencies
   - Continue learning, including not only pre-graduate work but also post-graduate education (specialities, lifelong learning).
   - Take advantage of opportunities for internships, volunteering and applying peer approaches.
   - Make use of guidance from more experienced colleagues, peer consultations and supervision.

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COMPENSATORY EXERCISE WITH DUAL-TASK USING KOMMO® FOR PEOPLE WITH SEDENTARY WORK

Gabriela FISAROVÁ, Klara NOVOTNÁ, Renata VETROVSKÁ

Abstract

Background: *Sedentary work increases the risk of back pain and reduces physical capacity. Cognitive-motor (dual-task) training can influence attention, postural control, and pain perception.*
Objective: *To evaluate the feasibility of a group compensatory exercise program using the Kommo® bar (dual-task approach) in sedentary workers and to assess its effects on spinal mobility and back pain.*
Methods: *Fifteen participants (11 women, 4 men; aged 20–59 years, mean age 41.8; average sitting time 8.6 h/day) completed an 8-week intervention (one 60-minute group session per week). Spinal mobility was assessed using Čepoj's distance, Ott's distance (inclination and reclination), Schober's distance, Stibor's distance, and Thomayer's test. Functional mobility was evaluated with the Five Times Sit-to-Stand test and the Timed Up and Go test (including the cognitive variant, TUGcog). Pain was assessed using the Visual Analogue Scale (VAS) and the McGill Pain Questionnaire. Data were analyzed with paired t-tests, after testing for normality with the Shapiro–Wilk test.*
Results: *All participants completed the program without complications (0% dropout). Significant improvements were observed in thoracic spine mobility (Ott, Stibor), functional mobility (5×STS, TUG, TUGcog), and perceived back pain (VAS, McGill).*
Conclusion: *An 8week compensatory exercise program with dual-task elements using the Kommo® bar is feasible and shows promise in reducing back pain and improving mobility in sedentary workers. Larger controlled studies are warranted.*

Keywords

sedentary work; compensatory exercise, back pain; dual-task; Kommo®

INTRODUCTION

Background

A sedentary lifestyle causes many health problems and affects both physical and mental health. Prolonged sitting, often combined with poor posture, is one of the most common causes of back pain. Back pain is one of the most prevalent health problems worldwide and is frequently associated with long-term sick leave, early retirement, and reduced quality of life. A sedentary lifestyle increases the likelihood of back pain recurrence by up to three times (Huo et al., 2023).

In clinical practice, back pain caused by sedentary workload is often treated with analgesics. However, when treating back pain, non-pharmacological approaches should be preferred over pharmacological treatments. These mainly include different types of exercise and other techniques such as manual therapy (mobilization and manipulation), massage, or acupuncture (Maher, Underwood, & Buchbinder, 2017). Exercise should be considered the first-line treatment for chronic back pain.

The following exercises are commonly recommended: McKenzie exercises, Pilates, yoga, and core muscle training (Maher, Underwood, & Buchbinder, 2017). Among these, Pilates and the McKenzie method have been shown to be the most effective (Hayden et al., 2021; Fernández-Rodríguez et al., 2022).

Dual-tasking is widely used in neurorehabilitation to assess a patient's condition and as part of therapy. It is applied to evaluate the executive functions responsible for dividing attention between tasks performed simultaneously. These dual tasks may involve cognitive or motor activities (MacPherson, 2018). The assessment of an individual's postural control under dual-task conditions is used to create more demanding situations (Pourahmadi et al., 2023). In therapy, dual-task training aims to improve the ability to perform activities simultaneously

so that attention is distributed more efficiently and individuals are better able to cope with situations where dual-tasking occurs.

Although dual-tasking is mainly used in neurological patients (such as those with Parkinson's disease, multiple sclerosis, or stroke), this type of training can also be beneficial for people with back pain for several reasons. Low back pain worsens proprioception in the lumbar region, making balance maintenance more challenging and requiring greater attentional effort compared to people without back pain (Hamacher, Hamacher, & Schega, 2014; Sherafat et al., 2014). In addition, some individuals with back pain may fear injury or worsening pain, which further occupies their attention and impairs motor control (Van Daele et al., 2010). Compared to healthy individuals, people with back pain demonstrate overloaded cognitive functions, especially executive functions (Shanbehzadeh et al., 2018).

Under dual-task conditions, dual-task interference may occur (Hamacher, Hamacher, & Schega, 2014; Corti, Gasson, & Loftus, 2021) because information from sensory and motor systems competes when the brain's attentional capacity is limited (Hamacher, Hamacher, & Schega, 2014). The use of dual-tasking can either improve or worsen postural control in people with low back pain. Its effect depends on factors such as age, emotions, muscle fatigue, proprioception, the quality of sensorimotor integration, attentional capacity, external environmental conditions, and especially the difficulty of the cognitive and postural task (Sherafat et al., 2014; Xiao et al., 2023). A dual task that is too simple will not engage enough attention and therefore will not distract the individual from pain. Conversely, a cognitive task that is too demanding will exceed attentional capacity and lead to dual-task interference, which also fails to distract from pain (Moore, Eccleston, & Keogh, 2017; Xiao et al., 2023). In such cases, one task is prioritized at the expense of the other. An example is the "posture-first" strategy, in which the brain sacrifices cognitive task performance to maintain balance. Motor (postural) performance improves at the expense of cognitive performance (Sherafat et al., 2014).

It follows that distracting attention from pain is only possible with moderately difficult cognitive tasks that engage attention but do not yet cause dual-task interference (Moore, Eccleston, & Keogh, 2017).

The aim of this pilot study was to determine the feasibility of cognitive-motor training with the Kommo® bar in individuals with sedentary computer-based jobs and to monitor the effect of compensatory exercises on spinal mobility and pain.

METHODS

Participants

The following inclusion criteria were applied: age between 18 and 60 years, sedentary occupation involving computer work (to ensure a comparable workload), and previous experience with back pain. Another criterion was the willingness to participate in regular group exercise. Exclusion criteria included acute back pain, pregnancy, or spinal disorders limiting mobility.

All participants were informed about the course of the therapy before it began and signed an informed consent form.

The group consisted of 15 participants (11 women and 4 men) with sedentary jobs, aged 20–59 years. Most were in the 40–49 age group.

Assessment

The effect of the therapy was evaluated using baseline and post-intervention functional examinations of the spine and selected functional tests. The following anthropometric methods were applied to assess spinal mobility: Čepoj's distance (cervical spine flexion range of motion), Ott's distance in inclination and reclination (thoracic spine mobility), Schober's distance (lumbar spine flexion), Stibor's distance (thoracic–lumbar flexion), and Thomayer's test (overall spinal mobility) (Kolář, 2020).

Functional mobility was assessed by a physiotherapist using the Five Times Sit-to-Stand test and the Timed Up and Go (TUG) test.

In the Five Times Sit-to-Stand test (5STS), the participant is asked to stand up from a chair

and sit back down five times in a row as quickly as possible. During the test, the participant should not touch the edge of the chair with the back of the lower limbs while standing, and should not lean against the backrest while sitting. The test is recommended for assessing lower limb muscle strength, stability, and overall physical condition. Quadriceps strength, sensorimotor system function, cognition, and balance are key factors in performance (Albalwi & Alharbi, 2023).

In the Timed Up and Go test (TUG), the participant is required to rise from a standard-height chair with armrests without using the upper limbs, walk at a normal pace to a line 3 meters away, turn around, return to the chair, and sit down. The Timed Up and Go test with a cognitive dual-task (TUGcog) is a modification of the classic TUG. In addition to standing up, walking, turning, returning, and sitting down, a cognitive task is added for example, repeatedly subtracting the number three from a given number. Adding a cognitive task increases attentional demands, thereby extending the time required to complete the test (Shumway-Cook, Brauer, & Woollacott, 2000).

Subjective pain intensity was assessed using the Visual Analogue Scale (VAS), ranging from 0 (no pain) to 10 (maximal pain). In addition, the standardized McGill Pain Questionnaire was used, where higher scores indicate greater perceived pain (Melzack, 1975; Knotek, Šolcová, & Žalský, 2002).

Exercise Program

Participants in the program completed a total of 8 weeks of therapy (one 60-minute group lesson per week). The sessions focused on compensating for sedentary work by straightening and mobilizing the spine, stretching shortened muscles, and strengthening weakened muscles. The Kommo® bar (Fig. 1) was chosen for the compensatory exercises, as it allows the combination of cognitive and motor tasks, i.e., dual-task exercises. The bar has five colored stripes (two red, two blue, and one yellow), which can be used as cues during exercise. During the exercises, the grip on the bar can be changed according to color, or a specific movement can be assigned to each stripe. The entire exercise program emphasized spinal mobility and included various lunge variations to improve pelvic and hip joint mobility. Cognitive dual-task elements (e.g., alternating grips by color, naming words by color, counting) were incorporated throughout. Examples of exercises are shown in Figures 2–4.

Statistical Analysis

The results were analyzed using descriptive statistics (mean, standard deviation, and frequency). Given the normal distribution of the data (tested with the Shapiro–Wilk test), paired t-tests were used to compare pre- and post-intervention values. All analyses were performed using SPSS version 22.

RESULTS

The mean age of participants was 41.8 years. More than half of them spent over 8 hours per day sitting (mean sitting time: 8.6 hours/day). Most reported experiencing only mild back pain at baseline. Detailed demographic characteristics are presented in Table 1.

All participants completed the entire 8-week program (no dropouts). After the intervention, a statistically significant increase was observed in thoracic spine mobility (Ott's distance and Stibor's distance). Functional mobility also improved, as reflected in the TUG test, including the cognitive variant (TUGcog). In addition, participants reported a significant reduction in perceived back pain. The recorded changes are summarized in Table 2.

DISCUSSION

After our 8-week exercise program with dual-task elements, 15 participants experienced a significant reduction in perceived back pain levels. They reported decreases in both current and usual back pain. Since all participants completed the program without complications, a similar group exercise program appears to be feasible. However, the results must be confirmed in a larger sample, ideally including a control group.

These results are consistent with a previous study that investigated an intervention among 24 office workers aged 40 ± 7.9 years, who spent approximately 8.6 hours per day sitting and had varying levels of regular physical activity. The intervention (weeks 1–4 of group

exercises, weeks 5–7 of independent home exercises) included breathing exercises, stretching of muscles overused during computer work, and activation of the deep stabilization system. Participants also received instruction in body awareness during work and daily activities. After completing the program, participants reported significant reductions in pain in the shoulder, cervical, and lumbar spine regions (Fortun-Rabadan et al., 2021).

Another study focusing on sedentary workers divided participants into two groups. The first group performed three exercises, 30 repetitions each, three times per week: squats, hip extensions in prone position, and a quadruped position shifting body weight toward the heels and back. The second group performed only pelvic retroversion in supine with lower limb flexion, sitting, and standing. The first group experienced reductions in lumbar pain and increased range of motion in hip flexion and extension, as hip muscle activity improved (Nishimura et al., 2021). However, these studies focused only on compensating for sedentary work and did not incorporate dual-task elements.

Several studies have examined the effect of dual-tasking on back pain, but most have focused only on testing. A 2021 study investigated cognitive–motor dual-task exercise in 296 older adults (>60 years). The intervention lasted 3 months and combined aerobic, resistance, and balance exercises with additional cognitive tasks (e.g., counting, memorizing sequences) or motor tasks (e.g., clapping). The participants reported reduced pain intensity and improvements in balance, cognition, and quality of life. The authors suggested that dual-task exercise may reduce pain by activating the fronto-temporo-parietal and prefrontal cortices, where opioid receptors are located, releasing endogenous opioids and providing pain relief (Merchant et al., 2021).

Another recent study examined the effect of simultaneously performing postural and cognitive tasks of varying difficulty on pain perception and trunk muscle activation in 19 young adults, including a control group without back pain. Participants stood on one leg while pressing a spring between two boards with the other leg. A cognitive task was added, requiring them to memorize five random numbers (0–100), perform calculations, and recall the five answers. Tasks were performed separately and together. The study found no significant differences in dual-task performance between individuals with and without back pain. However, almost all individuals with back pain showed increased trunk muscle activation under dual-task conditions compared to single-task conditions (Rowley, Winstein, & Kulig, 2020).

A 2023 review article compared studies investigating cognitive–motor dual-tasking in individuals with low back pain. Motor tasks included standing, sitting, and walking, while cognitive tasks were primarily arithmetic operations. The review found inconsistent conclusions regarding the effect of dual-task elements on postural control (Xiao et al., 2023).

The effect of dual-task exercise has also been studied in other types of pain. A 2020 systematic review examined dual-tasking in people with knee pain due to osteoarthritis and anterior cruciate ligament injuries. Compared to control groups, individuals with knee pain showed deterioration in gait and balance during dual-tasking. At the same time, they reported reductions in pain, possibly because attentional resources were occupied by the task, leaving fewer resources to process pain signals (Abdallat et al., 2020).

The potential of dual-task exercise to benefit people with back pain and other conditions warrants further investigation. Future studies should include larger samples and control groups.

CONCLUSION

Sedentary jobs represent a major challenge in modern society, as a sedentary lifestyle has negative effects on both physical and mental health. In particular, it contributes to back pain, one of the most common health problems worldwide, which can significantly impair quality of life. The Kommo® exercise program may represent a promising therapeutic tool for improving mobility and reducing back pain intensity. In this pilot program, participants experienced a significant reduction in perceived back pain, along with a statistically significant

improvement in thoracic spine mobility. Nevertheless, these results should be confirmed in future studies with larger samples.

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Table 1 – Demographic characteristic

Proband	Gender	Age (years)	Daily sedentary time (hours)	Current back pain (VAS) Min 0 max 10	Usual back pain (VAS) Min 0 max 10
1	Female	35	9	3	3
2	Female	55	5	0	0
3	Female	44	11	6	8
4	Female	47	9	6	4
5	Female	26	9	3	4
6	Female	45	8	2	2
7	Female	47	8	5	6
8	Female	49	8	1	2
9	Female	33	10	3	7
10	Female	44	8	3	4
11	Male	40	10	0	6
12	Male	38	10	2	4
13	Male	40	10	2	9
14	Male	42	8	2	3
15	Male	43	10	3	5
Mean		41,83 (SD 6,8)	8,86 (SD 1,40)	2,73 (SD 1,83)	4,47 (SD 2,41)

Table 2 – Effect of exercise on measured parameters

Parameters	Baseline assessment (n=15) Mean (SD)	After exercise (n=15) Mean (SD)	p-value
Čepoj's distance (cm)	1,4 (0,17)	1,3 (0,16)	0.683
Ott's inclination distance (cm)	1,6 (0,96)	2,53 (1,2)	0.004
Ott's reclination distance (cm)	-3,6 (1,7)	-3,47 (2,2)	0.605
Schober's distance (cm)	4,3 (1,2)	4,63 (0,97)	0.302
Stibor's distance (cm)	9,1 (1,7)	10,63 (1,6)	0.004
Thomayer test (cm)	-1,7 (10,6)	-3,3 (8,6)	0.112
Functional tests			
5times Sit to Stand test (sec)	8,78 (1,48)	8,22 (1,76)	0.167
TUG (sec)	8,33 (1,59)	7,65 (1,16)	0.049
TUG+cognitive dual task (sec)	10,81 (2,94)	9,95 (2,73)	0.049
Pain			
McGill Pain Questionnaire	17 (2,6)	16,6 (2,8)	0.7
Current pain (VAS)	2,73 (1,83)	0,93 (1,22)	0.000
Usual pain (VAS)	4,47 (2,41)	3,20 (2,30)	0.020

Figure 1: Kommo® bar

Figure 2–4: Examples of Kommo® exercise

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THE PHENOMENOLOGICAL APPROACH IN PSYCHOSOMATIC PRACTICE: A CASE STUDY OF A PATIENT WITH DYSPEPTIC COMPLAINTS

Michal Kryl

Abstract

The treatment of psychosomatic symptoms often requires specific psychotherapeutic guidance. Some schools and psychological approaches are grounded in the phenomenological approach to the person, that is, in their subjective experience and immediate lived reality. Daseinsanalytic psychotherapy, which is based principally on what is referred to as the philosophy of the German philosopher Martin Heidegger. Daseinsanalysis involves analysing the patient's "being there" (Dasein) and their mode of relating to the world, including to themselves (the "world-relation"). The human mode of being (existence, Dasein) is defined by specific attributes (interpretations of being, or clues) – "existentials". These number around twenty, including: being-in-the-world, openness, attunement, mortality, temporality, corporeality, authenticity, etc. The therapist works using a phenomenological method, i.e. focusing on what emerges in the session as a "phenomenon", that is, an immediately evident element of reality that is original, irreducible, and non-translatable and that carries a certain meaning. The search for meaning (i.e. interpretation of the phenomena) defines this therapy as "hermeneutic": it is essentially a process of self-clarification of understanding. The therapist conducts sessions in a non-directive manner, working in a mode of "leaping-ahead" care. Rather than intervening directly, the therapist creates a space in which the client can discover and realise their own possibilities of being. Describing a case of a patient with gastrointestinal difficulties, the following case study, accompanied by several comments, aims to illustrate some of the above-mentioned procedures using a practical example of the application of the daseinsanalytic method. Following short-term psychotherapy, the patient already exhibits signs of emerging from an unfree mode of existence, demonstrates improved self-awareness and understanding of the world, and reports relief from somatic complaints.

Keywords

psychosomatics, phenomenological approach, daseinsanalysis, case study

THEORETICAL INTRODUCTION

The psychosomatic approach in medicine should be underpinned by a multidisciplinary perspective, as, by its very nature, it involves a wide range of interventions by medical professionals and other specialists. In addition to an appropriate communication strategy, the treatment of psychosomatic symptoms often requires specific psychotherapeutic guidance (Čech et al., 2023). A comprehensive notion of the human being in their entirety (including physical attributes) has been explored by a number of psychotherapeutic schools, such as bioenergetics and biosynthesis, Gestalt therapy, process-oriented psychology (POP), satitherapy, and Pesso Boyden System Psychomotor therapy. Some schools and psychological approaches are grounded in the phenomenological approach to the person, that is, in their subjective experience and immediate lived reality (Cakirpaloglu & Jendrulková, 2022, p. 9). This represents a fundamentally different understanding of both the human being and the world compared to the traditional dualistic conception. Within this "philosophical mainstream," which has prevailed since the time of René Descartes, the mind and body are understood in dualistic terms: there is an external world (objective reality) and an internal world (the subjective mind), and knowledge is regarded as a representation of the external reality by the subject—an observer positioned "outside" of reality. In contrast, the phenomenological approach focuses on *being-in-the-world* (Heidegger's *In-der-Welt-sein*), in the sense that the human being is not a separate subject. On the contrary, we are relational beings, and the world discloses itself to us according to how we existentially find

ourselves within it (Hersch, 2003, pp. 23–38). Daseinsanalytic psychotherapy, which is based principally on what is referred to as the fundamental ontology of the German philosopher Martin Heidegger (1889–1976) and the founder of daseinsanalysis as a therapeutic discipline, Medard Boss (1903–1990), also belongs to this lineage. It is beyond the scope of this paper to present the school in its entirety and it will therefore limit itself to a few illustrative parameters. Daseinsanalysis involves analysing the patient's "being there" (*Dasein*) and their mode of relating to the world, including to themselves (the "world-relation"). Unlike reductionist approaches that interpret the human being from the standpoint of another discipline, for example a purely biological one, daseinsanalysis views the person comprehensively, "from within themselves" (Růžička, 2003, p. 26). The human mode of being (*existence*, *Dasein*) is defined by specific attributes (interpretations of being, or clues) – "existentials". These number around twenty, including: *being-in-the-world*, *openness*, *attunement*, *mortality*, *temporality*, *corporeality*, and *authenticity* (Hlavinka, 2021, pp. 342–343). The therapist works using a phenomenological method, i.e. focusing on what emerges in the session as a "*phenomenon*", that is, an immediately evident element of reality that is original (not derived from anything else), irreducible, and non-translatable (into any other terms) and that carries a certain meaning. The search for meaning (i.e. interpretation of the phenomena) defines this therapy as "hermeneutic": it is essentially a process of self-clarification of understanding (Růžička, 2003, p. 198). The therapist conducts sessions in a non-directive manner, working in a mode of "leaping-ahead" care. Leaping-ahead care is characterised by the therapist's effort to support the client on their path toward autonomy and authentic being. Rather than intervening directly, the therapist creates a space in which the client can discover and realise their own possibilities of being. This approach is liberating and future-oriented, as it prepares the client to assume responsibility for their own existence. Daseinsanalytic psychotherapy understands true care as the opening up of possibilities to be reached in the context of the therapeutic relationship by means of the "dissolution of resistance". This approach is founded on respect for the uniqueness of the client and their ability to find their own way towards authentic being. When this process is successful, one observes in the patient the phenomenon of "life gaining momentum", i.e. a shift towards a consciously lived, more authentic existence, resulting in greater freedom and responsibility for one's own life (Hlavinka, 2015, pp. 66–71).

In comparison to the traditional notion of psychosomatics, the daseinsanalytic approach has some specific features. In daseinsanalysis, the unity of human existence is so indivisible that there is no reason for fragmenting it into biological, psychological, or social components. To use Heidegger's phrasing: *Dasein* cannot be understood as a compound; it is a being that is primarily and fundamentally whole and uncompounded (Nitsche, 2011, p. 10). The concept of the body is "miles away" from the natural science notion of the body as a "Cartesian object". What is far closer to daseinsanalysis is the notion of the body (*sōma*, *péxis*) as an ensouled (i.e. living) body, a body that is experienced, not a body objectified in the scientific-materialist sense, as in somatic medicine. Here, we find something that is lived, that moves and experiences the world, and it is precisely this kind of body that falls within the domain of psychotherapeutic treatment. When understood in terms of the meaning of embodied being, a broken leg, concussion, or stroke is far more than a somatically removable defect of the physical body. A life damaged by injury is something else, something that carries a different quality than a mere tissue lesion (Condrau, 1998, p. 189). In daseinsanalysis, the body is an embodied relation to the world – a source of information about our existence and our attunement to the world and to ourselves. Through the integration of the lived body and existence, daseinsanalytic psychotherapy facilitates the emergence of authenticity and psychological freedom (Felder & Robbins, 2011). Physical symptoms and illness can also be seen as reminders that we have a body, or that "we are our body". Symptoms are not merely biological phenomena but signs of existential discord, which the therapist can name and attune together with the client (Čálek, 2005, pp. 483–504). In this sense, we may speak of the embodiment of

the patient's world-relations (Růžička, 2003, pp. 217, 223), and the relating of bodily phenomena to the patient's life and relationships in psychotherapeutic practice provides guidance towards self-clarifying understanding and the journey from inauthentic embeddedness to a more open and sustained mode of responding to the possibilities a person encounters.

Despite the somewhat complex terminology, daseinsanalytic practice unfolds in the mode of a "common, even ordinary" conversation, which daseinsanalytic terms do not enter into. The therapist chooses language appropriate to the patient's capacities, adapting to their pace of thought and speech. The conversation is conducted in a strictly non-directive manner: the therapist enters the sphere of the patient's world, initially seeking orientation within it (*coming to an initial understanding*), and subsequently dwells within it in a mode of empathic and engaged relating (*being-with-understanding*) (Růžička, 2022, pp. 10–44). In both phases, the therapist's practical tools include asking clarifying questions, checking whether they have understood correctly, gentle paraphrasing, and occasional reflections or observations. These may also involve sharing how the therapist imagines they might feel in the situations being discussed or "what they would be like for them". In daseinsanalysis, which does not work with symbolic substitution, a typical question would be: "What is (contained) IN THIS?" rather than: "What is (hidden) BEHIND THIS?" Similarly, we do not ask the patient directly about the "attunement existential"; instead, we use everyday language such as: "How is that for you?" or "What is that like for you?"

CASE STUDY

Describing a case of a patient with gastrointestinal difficulties, the following case study, accompanied by several comments, aims to illustrate some of the above-mentioned procedures using a practical example of the application of the daseinsanalytic method.

The patient, Ondřej, a 28-year-old university graduate from a single-parent family, self-referred for individual psychotherapy. He has been working for three years as a manager in an engineering company. He has long considered his difficulties to be psychosomatic, and his partner, who is three years younger, shares this view. Ondřej presents as a very gentle individual, speaking in a soft voice and sometimes struggling to find words to describe his condition. At times, he smiles self-consciously or even blushes faintly. He reports that conventional treatment has not helped, and he has begun to wonder whether his symptoms might be, as people say, "all in the head". Using relatively technical language, he explains that he suffers from gastro-oesophageal reflux, confirmed by gastroscopy. The condition has troubled him for a year and a half, and nothing seems to help, not even Helicid at a dose of 40 mg per day. He experiences burning or even pain from the chest up to the throat, where digestive juices rise (he demonstrates a choking gesture with his hand). They pass through the lower oesophageal sphincter, which, he says, is not functioning properly. He sees a connection with stress – sometimes experienced at work, at other times in the family and in relationships. He also admits to occasionally overeating unhealthy food.

The patient's preoccupation with his symptoms and his understanding of their physiological (or even physical) basis is evident. He also adheres to the "stress attribution" model, linking his condition to excessive strain stemming from frequent business trips, as well as relationship pressures, currently arising especially from his romantic relationship. A deeper connection between his physical symptoms and the overall structure of his existence, including the attunement of his world-relations, remains as yet concealed.

For several months, Ondřej has felt tension in his relationship with his girlfriend. They have been together for three years. The crisis has also affected their intimate life – sexual contact is frequently withheld by his partner and, considering their age, love-making has become very rare. Ondřej reports that they often discuss the situation late into the evening, but these conversations lead nowhere; they only result in sleepless nights and a lack of rest. When sleep-deprived, he experiences unpleasant sensations,

predominantly physical, in the region of his stomach and oesophagus. The relationship is marked by mutual sadness, irritation, and at times, sullen silence. Afterwards, he is plagued by feelings of guilt – thoughts that he has hurt Katka, that he has caused her pain. On the one hand, he does not want to pressure her into anything; on the other hand, he is troubled by the lack of sexual intimacy. Unsure of what to do, he prefers to stay silent and suppress his feelings.

Ondřej's gentle and mild nature soon reveals him to be someone who tends to withdraw in favour of the other in relational situations and conflicts. He struggles to harmonise the two modes of being – with others and for himself. He places upon himself a range of alien, non-authentic demands that he cannot meet. What emerges is an inauthentic, self-suppressing mode of existence, marked by an anxious attunement of his world-relations, which have long been embodied as physical symptoms that dominate the terrain of his life.

Reflecting on his position within the relationship, Ondřej shares, with a slightly guilty smile, that in conflicts he often retreats in pursuit of a "ceasefire". He is capable of persistently "arguing logically", although he has found this to be ineffective both with his partner and with his stepmother, his father's second wife. He has always felt a sense of rejection from her and describes their encounters as one painful clash after another. He says she often belittles and undermines him in front of others – most recently over his weight and diet patterns. Despite his attempts at "reasoned explanation", she remains unmoved, and he is left at a loss. He has considered cutting off contact with her but has never acted on the thought.

Ondřej's parents divorced when he was 13. He recalls suffering from severe diarrhoea at the time. In fact, he describes himself as having been quite "nervous" throughout childhood, and he was even seen by a psychologist. Later, having experienced persistent symptoms, he realised he was suffering from what is now known as irritable bowel syndrome.

The heralding function of the symptoms in Ondřej's childhood appears to have signalled his experience of frustration and helplessness in response to his parents' separation and the breakup of the family. Diarrhoea, in the mode of "self-emptying", reflected a state of surrender to the situation he had been thrust into as a boy. Irritable bowel syndrome, marked by a general disharmony in the digestive tract, is often associated with heartburn or even gastroesophageal reflux disease, as is the case here. Ondřej's abdominal embodiment of familial and relational discord has, through its chronicity, become embedded in his directly lived experience.

After the divorce, Ondřej stayed with his mother, though he frequently visited his father, to whom he says he is emotionally closer than to his mother and his 13-years-younger half-brother, born to her and her new partner. He is currently helping his father extensively with renovating a house. However, a major stressor in his father's home is the aforementioned stepmother. He emphasises that he must control himself in her presence, holding back his emotions. In arguments with her, he tries to stick to facts and logic, but it does not seem to help at all.

Here we come to another motif – or rather the opposite modality – namely that of "holding back". Like self-emptying, this too is often associated with altered physiological functions, such as withheld or excessive crying, breathing, or salivation, as well as defecation and the secretion of digestive juices. In individual sessions, we explore the referential links between Ondřej's symptoms and his mode of existence. Within my "coming to an initial understanding" (as I begin to share in Ondřej's sector of the world), I pose the question: what might be the significance of the reversal of normal digestive flow, i.e. from bottom to top, rather than the other way around? What does my patient make of this? Might it mirror some process in his world, a kind of inversion within his life possibilities? We uncover that Ondřej suppresses his emotions and cannot express them – so they are not pronounced where they should… Perhaps, then, it is the juices that are rising instead of feelings. I suggest reflecting on the dysfunction of the oesophageal sphincter, which, by nature, should close off the passage after a mouthful of food or drink, maintaining

the boundary between two bodily domains. Instead, it remains inappropriately open, allowing acidic contents to rise up through the oesophagus. What about Ondřej's own openness? Might this "incompetent gatekeeper", through its ill-suited lack of boundaries and its characteristically burning urgency, be signalling some deficit in his openness to the possibilities of his own life? This unpleasant physical phenomenon does seem to point to pressing (burning) questions arising from his being-in-the-world (*Dasein*), questions to which he has yet to find answers that truly fit him. The metaphorical arrow points toward his romantic relationship (where he hesitates to be more open and, as we have seen, tends to retreat), but also to other relationships (including those with the stepmother mentioned above and his critical biological mother). Ondřej is repeatedly exposed to unpleasant physical phenomena that epitomise the tension and discord in these relationships, and yet he dutifully continues to visit these family members at weekends, despite foreseeing that the encounters will involve conflicts. He does so for two main reasons: convention (it is "what is expected") and fear of the consequences if he did not come… What would they think of him? Would they reject him?

One of the goals Ondřej voiced during our first session – alongside coming to terms with the long-past event of his parents' divorce – was: "To be able to realise that I'm nervous, but then to calm myself down".

This sentence illustrates the original inauthenticity of Ondřej's mode of being. He initially understood embodiment (conceived as a set of somatic symptoms) in a mechanistic way, as a fact disconnected from the lived reality of his world and relationships. It was only through our shared (albeit not very long) period of focused work – analysing the nature and attunement of Ondřej's world-relations (anxious attunement), including the privation of possibilities that were available to him (to take his life into his own hands more maturely and courageously) – that Ondřej began to experience the desired improvement. He was surprised by the "depth" of our conversations, perceiving them as philosophical, despite their use of plain and accessible language. While continuing to receive biomedical care (gastroscopic monitoring and prokinetic medication), he was nevertheless surprised by the "asymptomatic intervals". Astonished, and with no explanation for it, he experienced a week free of any digestive difficulties. He soon linked the relief of symptoms to more open and courageous communication with his partner and a greater emphasis on his own needs, which in turn improved their relationship, including their sexual intimacy. Illness has brought him many insights; he feels that it has helped him to grow wiser. He is now able to think differently and about different things than before. He experiences less self-suppression and less restrictive behaviour around food, which had previously led to overeating and symptom aggravation resulting from dietary mistakes. He has introduced elements of mindfulness into his life, including meditation, follows a rational diet, and watches his weight. He has come to place more value on the things and relationships he has, including his relationship with Katka. He has managed to let go of a biomechanistic view of his symptoms and no longer seeks further medical investigations or experimental treatment methods that he had previously been offered. He is better at articulating what he feels and has developed a deeper understanding of his bodily phenomena. Although his reflux symptoms have not disappeared entirely, he no longer attaches exaggerated significance to them or devotes as much attention to them. Even though further challenges still lie ahead of him (conflicts with some family members persist), Ondřej has come to realise that he is on a new and better path – a path towards a life gaining momentum and full ownership of his personal responsibility.

SUMMARY

The phenomenological approach in psychotherapy does not represent a mainstream method for treating mental disorders. By its very nature, it resists objectifiable outcomes derived from large patient populations, as required by the framework of evidence-based medicine (EBM). This makes its focus on the individual narrative of a person suffering from difficulties—emerging from and intertwined with the structure of their existence and their

being-in-the-world (*In-der-Welt-sein*)—all the more valuable. In the daseinsanalytic mode of care (a variant of phenomenological therapy), which seeks to understand the phenomena that emerge within the therapeutic process, not only can clinical improvement occur, but also the patient may be liberated toward a more authentic way of being. The present case study of a young man suffering from gastrointestinal difficulties aims to illustrate precisely such a situation.

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EFFECT OF A STRENGTH TRAINING PROGRAM ON LOW BACK PAIN

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Abstract

***Introduction**: Low back pain (LBP) is one of the most common reasons for seeking medical care, with a significant economic impact and a lifetime prevalence of 60–90%. During chronic LBP therapy, an emphasis is placed on maintaining physical activity with various forms of exercise. Based on current research, intensive strength training may be considered an effective and well-tolerated approach that, when appropriately tailored to the individual, should not increase the risk of injury and can help with pain management.*

***Aim**: The main objective of our study is to determine the effect of a strength training program on LBP, particularly on pain intensity and its impact on lifestyle, as well as the change in quantitative parameters.*

***Methods**: Our research is conceived in the form of case studies, including five participants aged 27–63 years, who were experiencing chronic LBP. At baseline, an assessment was conducted, which included a medical history interview, a visual analogue scale, and a musculoskeletal examination. Participants attended the strength training program twice a week for a period of three months. Afterwards, the exit assessment was performed. The impact of movement therapy was compared quantitatively by changes between baseline and exit assessment, and qualitatively with regard to subjective changes in LBP and its impact on the participants' lifestyle.*

***Results**: This study demonstrates that all participants experienced an average reduction in pain intensity of 58±23%, and an improvement in lifestyle of 76±28% compared to the baseline assessment. Muscle shortening (by an average of 42±12%) and muscle strength (by an average of 23±14%) were improved in all participants. Fitness level (reduction in heart rate by an average of 7±7%) and spinal mobility in Otto's Index (by an average of 26±15%) improved in the majority of the participants.*

***Conclusion**: Strength training helped to affect pain in participants positively, and hence it might suggest considering movement therapy in the form of strength training as part of conservative treatment in selected individuals with LBP.*

Keywords

intervention, low back pain, movement, strength training

INTRODUCTION

Low back pain (LBP) is one of the most common reasons for patients seeking primary and emergency medical care. In the Czech Republic, it is the fifth most common cause of hospitalization and is responsible for one-third of work disability cases (Ryba et al., 2022). The annual incidence is approximately 5%, while the annual prevalence is 15–45% and the lifetime prevalence is 60–90% (Skála, 2011).

Three basic groups of LBP are distinguished: non-specific (accounting for 85–95% of acute LBP having no structural cause), specific back pain caused by severe organic damage to the spine (e.g., trauma, malignancy, etc.), and neurogenic pain (e.g., radiculopathy, lumbar stenosis, or cauda equina syndrome) (Ostrý et al., 2020). In principle, any innervated structure of the lumbar spine can be the source of LBP, i.e., any of the ligaments, muscles, fasciae, joints, or intervertebral discs (Adams et al., 2013). Among the risk factors contributing to disabling LBP might be various biophysical, psychological, social, and genetic factors, and comorbidities (Hartvigsen et al., 2018).

The differential diagnosis focuses on ruling out the specific causes of pain (mechanical, degenerative, inflammatory, oncological, or infectious). Therefore, it is important to notice red flags during the medical history assessment and physical examination (Ryba

et al., 2022). It usually consists of aspection, palpation, spinal mobility, and neurological assessment (focusing on tension maneuvers and myotatic reflexes) (Hart, 2014).

LBP treatment might include pharmacological therapy, surgical interventions, or rehabilitation, which includes physical therapy, exercise, spinal manipulation, and other practices. While exercise is considered to be ineffective for acute LBP, it might be effective for patients with subacute or chronic LBP (Pergolizzi & LeQuang, 2020).

Resistance training, also known as strength training or weight training, is considered one of the most popular forms of exercise for enhancing physical fitness. It encompasses a wide range of training modalities, including bodyweight exercises, the use of elastic bands, plyometrics, free weights, and weight training machines (Fleck & Kraemer, 2014). Strength training is a valuable tool in the rehabilitation of various musculoskeletal conditions, particularly those where loss of muscular strength and functional ability is evident. Hence, beneficial impacts are apparent in chronic conditions such as recurrent LBP (Kristensen & Franklyn-Miller, 2012).

OBJECTIVE

Our study aimed to qualitatively evaluate the effectiveness of a strength training program on pain intensity and its impact on the lifestyle of individuals with LBP. Moreover, quantitative indicators, such as muscle shortening, spinal mobility, muscle strength, and fitness level, have been considered to assess the changes between the baseline and exit assessments.

METHODOLOGY

Sample and settings

This research has been conducted in the form of case studies offering a strength training program to interested individuals who have been experiencing LBP for at least three months and are within the age range of 18–65 years. Pregnant women, individuals with acute injuries or post-surgery conditions, persons undergoing different forms of treatment (e.g., physiotherapy, pharmacotherapy), and individuals with severe health conditions (e.g., severe neurological, cardiological, renal diseases, etc.) were excluded from the study.

Our sample involved five participants (three women and two men) aged 27–63 years who reported long-term LBP (lasting for an average of 49.2±40.6 months). All individuals have participated in the baseline assessment, structured strength training program, and exit assessment. Initially, one more participant was enrolled in this study; however, due to the severity of his condition, he was excluded from the research and referred to a physiotherapist.

All participants provided informed consent to participate in the study, which was approved by the Ethical Committee of the College of Physical Education and Sport Palestra (VŠP/7731/2024).

Baseline and exit assessment

To evaluate the impact of the exercise program, assessments were conducted at baseline and after the intervention was completed. Participants have provided their medical history with a focus on analyzing LBP. Moreover, they have been presented with two Visual Analogue Scales (VAS) to assess their current pain intensity and lifestyle change caused by pain, scaled 0–100 (Ogon et al., 1996). Additionally, a posture assessment and a series of tests were performed, as detailed in Table 1

Exercise program

All five participants attended an individual strength training program twice a week for a period of three months. Each training session lasted about 60–75 minutes and was supervised by an experienced personal trainer (author of this study). The exercise program took into account the individual's training volume and intensity of the exercises. It was regulated according to the rate of perceived exertion (RPE) and repetitions in reserve (RIR). Although the pace of individual exercises was not set, participants were instructed to perform all exercises with an emphasis on control and movement quality. Progressive overload was considered in relation to the individual tolerance of each participant to avoid pain flare-ups.

Each training session consisted of four parts – warm-up, main body of the session, cardiorespiratory training, and cool-down. In

an effort to diversify the exercises and promote comprehensive development and entertainment among participants, to enhance adherence to the program, four sample training sessions were conceived (A1, A2, B1, and B2). One of the sample training sessions is detailed in Table 2.
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Table 1 Baseline and Exit Assessment

Activity	Description
Aspection	Evaluation of the posture, assessed from the anterior, posterior, and lateral views. In addition, the Trendelenburg test was performed.
Palpation	Palpation of spinous processes, the diaphragm test, and the intra-abdominal pressure test.
Janda's basic movement patterns	Hip extension, hip abduction, curl-up, cervical flexion, shoulder abduction, push-up.
Range-of-motion assessment	Goniometric measurements were performed using the SFTR method, focusing on active joint motions of the hip and shoulder.
Janda's muscle test to determine muscle shortening	Assessment of the following muscles: m. soleus, hip joint flexors (i.e., m. iliopsoas, m. rectus femoris, m. tensor fasciae latae), knee joint flexors, hip joint adductors, m. piriformis, m. quadratus lumborum, paravertebral back muscles. To determine muscle shortening, three levels are used (0–2).
Joint hypermobility assessment	Beighton score with a range of scoring 0–9 related to five maneuvers.
Spinal mobility assessment	Various tests measuring the range of motion of individual spinal segments: Schober's distance, Stibor's distance, Otto's Index, Cepojevov's distance, Forestier fleche, Thomayer's test, and lateroflexion.
Muscle strength assessment	Janda's muscle test with six levels (0–5) to determine muscle strength of the following movements: hip flexion, hip extension, hip adduction, hip abduction, knee flexion, knee extension, ankle plantar flexion, ankle plantar flexion (m. soleus), ankle supination with dorsiflexion, and interphalangeal joint of the hallux extension. Moreover, isometric muscle strength has also been tested using the digital handheld dynamometer microFET®2, measured approximately in the middle of the range of motion, as per Janda's muscle test.
Neurological assessment	Tension maneuvers (i.e., Lasègue's maneuver, Bragard's test, extended Lasègue's maneuver, crossed Lasègue's maneuver, "Reverse" Lasègue's maneuver) and myotatic reflexes (i.e., Achilles tendon reflex, plantar reflex, and patellar reflex) with six levels (0–5).
Fitness level assessment	The Kasch step test focuses on post-exercise recovery heart rate, categorizing individuals based on their cardiorespiratory fitness level.
Additional examination	The Patrick-FABER test and the Kemp test.

Table 2 Sample training session A1

Warm-up				
Exercise	**Series**	**Repetitions**	**RPE/RIR**	**Rest**
Floor slide	1	10	-	0 sec
Supine band hip flexion	1	8	-	0 sec
Resistance band walk (linear and lateral)	1	6 meters/ direction	-	0 sec
Cat-camel	1	6	-	0 sec
Sliding body saw	2	6	6/4	45 sec
Bird dog	2	4 (with 10 sec hold)	3/6+	45 sec
Half-kneeling cable chop	2	8	5/5	45 sec
Main body of the session				
Exercise	**Series**	**Repetitions**	**RPE/RIR**	**Rest**
Standing medicine ball chest pass (2 kg)	2	12	1/10+	45 sec
Box jump (45 cm male, 30 cm female)	2	6	1/10+	45 sec
Goblet squat	4	6–8	6/4	120 sec
TRX inverted row	4	8	7/3	100 sec
Sliding leg curl	3	8	6/4	60 sec
Incline dumbbell bench press (80°)	4	6	6/4	100 sec
Straight-arm pulldown	3	10	7/3	100 sec
Farmer carry	2	60 sec	75 %	60 sec
Cardiorespiratory training				
Exercise	**Series**	**Work period**	**Intensity**	**Rest**
Air bike ergometer	5	10 sec	85 %	60 sec
Cool-down				
Supine position with a prolonged inhalation through the nose and controlled exhalation through the mouth.				

RESULTS

Observed exit assessment improvements are detailed in Table 3.

Apart from that, the aspection assessment has confirmed the clearing of the initially positive Trendelenburg test in one of the participants, and it has shown slight improvements in some aspects of posture across all participants (e.g., reduction of shoulder protraction or cervical lordosis); however, no fundamental changes were observed. Similar outcomes have also been noted for palpation assessment. Additionally, out of five participants, four have shown moderate improvement in muscle sequencing in Janda's basic movement patterns. The range-of-motion assessment has shown inconsistent changes in all participants. Hypermobility was observed in one participant and remained unchanged throughout the intervention program. Spinal mobility assessment revealed different results among participants, although Otto's Index was increased in four participants. While tension maneuvers have been tested negatively in both baseline and exit assessments among all participants, the patellar reflex in one participant slightly decreased. Regarding the additional examination, one participant was positively tested for the Patrick-FABER test and was confirmed as negative during the exit assessment, while another participant was positive for the Patrick-FABER and Kemp test, with negative results for the latter during the exit assessment.

Table 3 Percentage improvements among participants in individual assessments

Assessment	P1	P2	P3	P4	P5	Among all P
VAS 1 (%)	80.0	75.0	75.0	25.0	33.3	57.7±23.5
VAS 2 (%)	90.0	81.8	100.0	20.0	85.7	75.5±28.4
Muscle shortening (%)	40.0	25.0	63.6	40.0	40.0	41.7±12.4
Otto's Index (%)	19.0	34.0	40.0	0.0	34.0	25.5±14.6
Fitness level (%)	5.3	19.5	-1.6	5.6	4.9	6.7±6.9

Note. P – participant; VAS – visual analogue scale.

The muscle strength, as measured by the handheld digital dynamometer, showed a notable average increase among all participants (for further details, see Table 4).

Table 4 Muscle strength tested by dynamometer, percentage improvements among participants

Tested movement	P1 (%)	P2 (%)	P3 (%)	P4 (%)	P5 (%)	Among all P (%)
Hip flexion	17.9	35.2	9.1	**0.0**	10.7	14.6±11.8
Hip extension	12.2	18.6	49.9	5.9	14.1	20.1±15.4
Hip adduction	9.5	36.5	57.9	10.8	16.4	26.2±18.6
Hip abduction	25.5	106.3	84.1	**0.0**	13.2	45.8±41.7
Knee flexion	4.3	57.4	71.2	22.4	31.5	37.4±24.1
Knee extension	34.0	37.6	13.9	4.7	14.9	21.0±12.7
Ankle plantar flexion	18.8	13.3	24.8	5.4	3.3	13.1±8.0
Ankle plantar flexion (m. soleus)	13.4	18.6	25.3	9.9	5.8	14.6±6.8
Ankle supination with dorsiflexion	14.4	41.5	60.4	4.1	8.3	25.7±21.7
Interphalangeal joint of the hallux extension	7.8	23.7	5.3	1.3	1.0	7.8±8.3
Total average improvement	15.8	38.9	40.2	6.4	11.9	**22.6±14.1**

Note. P – participant; in red – could not be tested at baseline due to the presence of pain, hence, no percentage improvement noted.

DISCUSSION

After three months of a strength training program, subjectively perceived pain intensity and its impact on individuals' lifestyles have been noticeably reduced in all participants. Strength training might be used as one of the options for exercise therapy in individuals with LBP, with potential effect on reducing LBP symptoms and pain-related disability (Pergolizzi & LeQuang, 2020; Quittan, 2002). Some sources suggest that specific forms of training may have even more significant effects on pain reduction, such as posterior-chain resistance training (Tataryn et al., 2021) or core strength training (Chang et al., 2015). Additionally, it appears that changes in pain levels are not only influenced by the intervention program itself, but also by its form, with supervised exercise showing better results than unsupervised exercise at home (Frost et al., 1995). A study focusing on strength training with exercises commonly used by powerlifters has observed meaningful reductions in pain intensity, pain-related disability, pain self-efficacy, and muscle strength (Tjøsvoll et al., 2020).

This study has several limitations. Firstly, due to the limited number of participants, the applicability of the results to a broader population is reduced, and hence, further research focusing on a larger sample is required. While the etiology of LBP is diverse, it is essential to select a therapeutic approach individually, as the strength training may not be suitable for everyone. During the exit assessment, since participants were already aware of the structure and knew what to expect, they might have been motivated and tried harder, achieving better results compared to the baseline assessment.

CONCLUSIONS

The strength training program was observed to have a positive influence on pain intensity as well as its impact on the participants' lifestyle, which may suggest that this form of intervention could be considered a potential conservative treatment for selected individuals with LBP. Moreover, an improvement in certain quantitative aspects (i.e., muscle shortening, muscle strength, spinal mobility, and fitness level) has been observed in the majority of participants. While the results look promising, it would be beneficial to assess a strength training program as a form of therapy on a larger sample of individuals.

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