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Content

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Editorial

Marcus Stueck, Sebastian Mueller Haugk

What is Biocentric Science?

Let's explain it by using the example of a horse. In classical sciences, the horse is studied without riding it. It is examined, analyzed, assessed, from the inside and the outside. In the biocentric sciences we examine the horse from both the inside and outside and additionally we ride the horse. We experience it. This means that the experience is part of the scientific methods, just like the classical scientific methods: the experiment, the qualitative and the quasi-experimental research methods. The artificial separation between subject and object can no longer be maintained, because it has finally shown that it leads to the separation of humans from nature. (Stueck, 2023, Relative Biocentric Health Theory).

In the biocentric sciences we go from the darkness of security into the light of insecurity (Mariella, cited in Stueck, 2023, relative biocentric Health Theory).

Bionet, as Biocentric Network was launched in 2012 with the first Bionet meeting at the University of Education in Riga. This meeting was the starting point for further interesting research and meetings or publications in the Bionet journal Biocentric Sciences. So far 3 issues (volumes) have been published. With the present issue, a 4th volume is now available. What is the purpose of Bionet?

The journal is dedicated to articles with Biocentric orientation and studies that use the methods of Biocentric Sciences, that is, in addition to the experience, as a scientific method, the qualitative, quasi-experimental, experimental research methods. Moreover, it is an interdisciplinary approach to which Biocentric Science subscribes. The foundations of this scientific holistic approach („complete science", Stueck, 2023) are laid and promoted at the „International Biocentric Research Academy" (IBRA) www.bionet-research.com. In the IBRA, biocentrically oriented scientists work in a network on various biocentric topics and projects, including the topic of Biodanza and science, or the topic of environment and diseases.

This volume 4 of the Bionet journal Biocentric Sciences deals with interesting contributions of a psychological meeting of 2022, hosted by colleagues from the Universities of Leipzig and Evora in Portugal. This meeting focused on the theme „New Horizons and New Paradigms in Health and Human Development". This topic is especially important after the lived through COVID19 crisis and the ongoing martial and inhuman Ukraine war, but also the newly flared up Middle East conflict these days.
Why did we include this topic on this conference in our journal? Because they are biocentric contributions. They are biocentric contributions because they describe and explore resources and competencies necessary for achieving connection to life, with its most diverse forms. Allowing individuals and the systems in which they live to remain alive, despite possibly difficult conditions as we find them at the moment. For this is biocentric (bios=life, center=center), in contrast to anthropocentric views that examine and describe humans at the center, without their connection to other humans and to other life forms in nature. The contributions in this Volume 4 are biocentric in that they discuss the boundaries that exist stressfully that make it impossible for humans to connect with themselves, with others, and with nature. These so-called biocentric limits, so named in the model of relative biocentric health theory (Stueck, 2023), but also the competencies and resources, are thereby discussed in Volume 4 in 3 domains: for health, for education, and for aging.

Müller-Haugk (2023) examined this model and found that people who lose their connection to the source for health (limited harmony) also have too many biocentric limits (anxiety, stress, exhaustion). We hope the reader enjoys reflecting on the Biocentric Boundaries, and those on the Resources and Source for Health.

18. Februar 2023

I Leipzig-Evora-Zwickau Scientific Meeting in Health Sciences and Human Development

VI Leipzig-Evora Scientific Meeting in Psychology

PREFACE

In the frame of the already long and fruitful collaboration between the University of Evora (Portugal) and the University of Leipzig (Germany), enriched now with the contribution of the West Saxon University of Applied Sciences of Zwickau, scientists of these institutions and international guests met in Evora on 3rd and 4th October, 2022, in order to explain each other their current research interests and present results in their topics of research. The sixth edition of the Leipzig-Evora Scientific Meeting in Psychology, transformed now in Leipzig-Evora-Zwickau Scientific Meeting in Health Sciences and Human Development, has been devoted to central topics of current health sciences, namely, stress, ageing, and education for health. This volume contains some of the most relevant works given during the meeting.

Reschke & Stöber report on the management programs developed at the University of Leipzig for different target groups on the basis of the action theory, the salutogenetic approach, cognitive behavior therapy, the solution- and resource-oriented approach and positive psychology. Three contributions are devoted to the psychological effects of the COVID-19 pandemic. In the first, Félix & Candeias explore the impact on the lives of secondary school students, affecting their well-being, mindset, and levels of stress, including the potential long-term consequences of these stressors on students' mental health and academic performance. Then, Silva, Félix & Candeias analize the interconnections between stress, mindset, lifestyle changes, and the experiences of university students during the pandemic, finding significant effects on mental health, with increased stress, anxiety, and depression. Galindo studies the psychological effects of COVID-19 pandemic, comparing with the predictions of a remarkable book, the "Psychology of Pandemics" of Taylor (2019), with emphasis on the role of cognitive factors like thoughts and beliefs and behavioral patterns like adherence to rules in the determination of the development of the illness at an individual level, as well as the spread of the disease at a social level. In other context, Polyvyannaya investigates the complex interplay among biopsychosocial, and individual factors in the experience and management of chronic pain, proposing a holistic approach highlighting the integration of optimal practices in non-pharmacological interventions. Three studies are devoted to aging and health.Morais, Pereira & Almeida analyze the impact of a psychomotor intervention in psychomotor profile and three specific components – motor prevalence, cognitive prevalence, and physical constraints-, in elderly institutionalized people, with positive results showing the importance of this kind of intervention in geriatric care. Pereira, Bravo, Candeias, A., Almeida propose an integrated model of action for healthy ageing for the purpose of extending lifespan. Gracio, Carapeto & Pires review the research on factors associated with well-being and quality of life in aging indentifying three main themes, a first one on the point of view of the elderly about specific contexts of their lives, a second group about the role of spirituality in well-being, and a third describing the positive functioning of middle-aged and elderly people. Tischendorf, & Schaal addresses a main topic of the modern society, making an international comparison about the digital competences in different populations, a challenge for the functioning of modern society. Beja, Franco, & Almeida seek to establish correlations between parental burnout and family resilience and several sociodemographic variables that are supposed to influence the levels of parental burnout. The found age differences in the levels of parental burnout and significant negative correlations between parental burnout and family resilience. Last, but not least, Candeias, Almeida, Félix, & Portelada analyze the barriers, facilitators and methodologies of educational practice for the of individuals with special educational needs inclusion in Portugal. Finally, Marcus Stueck describes biocentric components of mental, psychological and physical health in children and derives them from his new Relative Biocentric Health Theory.

At the end of the Journal-Volume we pay tribute to our long-time companion and outstanding scientist and colleague, Prof. Evelin Witruk, who died suddenly and unexpectedly on October 11, 2023. We will remember you forever and continue our work in your interests. Prof. Evelin Witruk was the co-founder and the idea giver behind all the conferences. We miss you.

To finalize we are grateful to Journal Bionet "Biocentric Sciences" and its editors and reviewers for the support to this publication with some of the most scientific contribution's given during the meeting.

Adelinda Candeias, Edgar Galindo, Beate Mitzscherlich, Konrad Reschke & Marcus Stueck

September, 2023

I Leipzig-Evora-Zwickau Scientific Meeting in Health Sciences and Human Development

VI Leipzig-Évora Scientific Meeting in Psychology Scientific Program

MONDAY 3rd OCTOBER, 2022

9:00 **OPENING SESSION**
Chairperson: Adelinda Candeias

University of Leipzig
Konrad Reschke

University of Zwickau
Beate Mitzscherlich

University of Évora
Director of CRCH, Director of Department Psychology,
Director of Department of Medical Sciences and Human Development

9:30–11:00 **SESSION 1**
Chairperson: Konrad Reschke

A program family for preventive and interventive stress management – theoretical and practical aspects
Konrad Reschke
University of Leipzig, Germany

Profiles of Emotional Intelligence and Vulnerability to Stress in Secondary School Teachers
Maria João Beja, Maria Glória Franco & João Almeida
University of Madeira

Environmental contamination: an (almost) neglected factor in stress?
M. Ramiro Pastorinho
University of Évora, Portugal

Relationship of anxiety management types and health-related variables of people during lockdown in a German sample.
Sebastian Mueller Haugk & Marcus Stueck
DPFA Academy of Work and Health, Germany

11:00–11:30 **COFEE BREAK**

11:30–13:00 **SESSION 2**
Chairperson: Beate Mitzscherlich

Moral Distress in the Corona Pandemic – Ethics Support for Health Care Professionals in Germany
Beate Mitzscherlich
West Saxon University of Applied Sciences Zwickau, Germany

"Leipziger Kurzfragebogen für chronischen Stress" (LKCS) –
Psychometric studies for Portuguese population
Adelinda Candeias, Edgar Galindo, Konrad Reschke, A. Felix, & C. Silva
University of Evora, Portugal & University of Leipzig, Germany

Health Psychology and pandemics: What did we learn?
Edgar Galindo
University of Evora, Portugal

13:00–14:00 **LUNCH**

14:00–15:30 **SESSION 3**
Chairperson: Edgar Galindo

Technical innovations in stroke rehabilitation – A mixed-methods approach for development of non-invasive, brainwave-guided, functional muscle stimulation.
Tom Schaal, Tim Tischendorf, Julia Winterlich & Stefanie Liebl
West Saxon University of Applied Sciences Zwickau & University of Applied Sciences, Mittweida, Germany

Stress and well-being in pandemics: A study with students.
Adriana Felix & Adelinda Candeias
University of Evora, Portugal

Non-pharmacological interventions for chronic pain: systemic basis
Natalya Polyvyanaya
KazNU, Almaty, Kazakhstan

Career adaptability, subjective well-being and academic achievement in higher education Angolan students
Ana Maria Rocha & Jocobus G. Maree
Catholic University of Angola, Angola & University of Pretoria, South Africa

15:30–16:00 **COFEE BREAK**

16:30–18:00 **SESSION 4**
Chairperson: Evelin Witruk

Why Dyslexia is a risk for the personality development?
Evelin Witruk
University of Leipzig, Germany

Communication is in your hands:
online course to promote communication about sexuality in parents of deaf youth.
Susana Bárcena, Ireri López & José Manuel Meza
National Autonomous University of Mexico, Mexico

Coparenting, Family Resilience and Parental Burnout
Maria Glória Franco, Maria João Beja & Natalie Santos
University of Madeira & ISPA(Lisbon), Portugal

Inclusive attitudes: emotional, cognitive and behavioral differences between teachers and therapist
Adelinda Candeias, Heldemerina Pires, Clarisse Coelho, Edgar Galindo & Adriana Felix

19:45 **CULTURAL DINNER & FADO**

TUESDAY 4TH OCTOBER, 2022

9:00–11:00 **SESSION 4**
Chairperson: Catarina Pereira

Sustainable living in old age by the use of technical assistance – some theoretical remarks and insights in practical applications
Martin Grünendahl
West Saxon University of Applied Sciences Zwickau, Germany

Effects of a psychomotor intervention on psychomotor profile in institutionalized elderly with mild dependency and cognitive deficit
Ana Morais, Filipa Pereira & Gabriela Almeida
University of Evora, Portugal

Ageing Health and Integrative Lifespan
Catarina Pereira, Gabriela Almeida & Jorge Bravo
University of Evora, Portugal

Ageing and Well-Being: Views, Experiences and Contexts
Luísa Grácio, Maria João Carapeto & Heldemerina Pires
University of Evora, Portugal

11:00–11:15 **COFEE BREAK**

11:15–12:30 **SESSION 5**
Chairperson: Marcus Stueck

The Pandemic Management Theory. COVID-19 and biocentric development
Marcus Stueck
DPFA Academy of Work and Health, Germany

Woman and the Phenomenon of Forgiveness
Sharapat Sultanaliyeva & Alena Garber
Al-Farabi Kazakh National University, Kazakhstan & Klinik Reinhardshöhe, Bad Wildungen, Germany

Teacher's health and well-being: Relationships with teacher's health, organizational health and optimism
Liberata Borralho, Adelinda Candeias e Saúl Neves de Jesus
University of Evora & University of Algarve, Portugal

12:30 **BOOK PRESENTATION**
Presentation of the book "Gestão optimista do stresse"
Konrad Reschke, Edgar Galindo, Adelinda Candeias, Luísa Grácio e Catarina Vaz-Velho

13:00 **CLOSING SESSION**
Chairperson: Adelinda Candeias & Beate Mitzscherlich

Beate Mitzscherlich, Evelyn Witruk, Adelinda Candeias, Marcus Stueck

A program family for preventive stress management and stress-related health promotion – theoretical and practical aspects

Prof. Dr. Konrad Reschke[a], Dr. Franziska Stöber[b]

REVIEWED
Marcus Stueck
Sebastian Müller-Haug
Int. Biocentric Research Academy/IBRA

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Martina Goth

AFFILIATION
a International Biocentric Research Academy
Orcid: 0000-0002-0430-5691
b International Biocentric Research Academy, info@psychotherapie-stoeber.de
Orcid: 0009-0008-4143-0636

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CORRESPONDENCE
Prof. Dr. Konrad Reschke
Psychotherapie Praxis
Nonnenstr. 11c
04229 Leipzig
konrad.reschke@web.de

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ABSTRACT

This paper reports about the program development of stress management programs at department of Psychology of the University of Leipzig. In the period from 1996 to 2023 four stress management approaches for different target groups were developed, evaluated and transferred into practice. The common theoretical backgrounds of the all of the program developments are: action theory (Scheuch & Schröder, 1991), the salutogenetic approach (Antonovsky, 1979, 1987, 1997), the cognitive behavior therapy third wave (Michalak, 2013), the solution- and resource oriented approach (de Shazer, 1990), the theory of optimism (Carver & Scheier, 1985) and the PERMA – model of modern Positive Psychology (Seligman, 2012) and the modern personality approach of identity (Keupp & Höfer, 1997).

KEYWORDS
stress, salutogenesis, positive psychology, retirement, older drivers, parenting

1 Aim and goal

In this paper we will give an overview about the development of prevention programs for stress management at the Dept. Psychology of Leipzig University from 1996 up to now. We discuss in brief the used theoretical backgrounds and the stress model and formulate the standards for the development of modern interventions programs for stress (Reschke, 1922, Schumacher, Reschke & Schröder, 2002). After a brief description of the developed stress management programs some selected results of the evaluation of the basic program "Mastering stress optimistically" will be discussed. We hope to illustrate and to show what can be the features and the ingredients of modern, health psychology and personality psychology based stress managements programs.

2 Theoretical backgrounds in stress management program research

In the Department of Psychology of the Leipzig University we developed in the last 25 years prevention programs for stress management. The programs should fulfill the high standards of psychological intervention programs that are: theoretical background oriented at clinical, health psychological and prevention research standards, multimodal structure, flexible-mineralized formatted for variable use in practice, positive evaluation studies, publication of a trainer's manual and participant's booklet, translational activities for wide use in practice, train the trainer opportunities. Now, in the year 2023 we finished with the publication of two manuals. Therefore we would like to give a theoretical and practical overview to the program family for preventive and health promoting stress management which has two main features in the title and within the program: "Optimism, Mindfulness and Stress Coping". In the article the up to now developed and published programs are shortly described. The main goals, features and very interesting training methods will be reported. The article also refers to an open project "Mastering parental stress optimistically", which is under construction and publication. Also, some very important new aspects in the development of stress prevention approaches will be reported, which are not incorporated in the most stress management approaches.

Stress is no stranger to anyone: drastic experiences such as the death of a spouse, a chronic illness or the transition to a post-professional life can take up a lot of our energy and attention. Numerous studies prove this. Everyday stress, smaller, everyday stress factors, but especially crisis scenarios of our time (war, political conflicts, finance and inflation, energy costs, Corona, environment crises and social insecurity as a deviation from the planned retirement can affect mood and experience.

For the program development we used a broad variety of theoretical backgrounds of stress:

- The action theory (Scheuch & Schröder, 1990)
- The Transactional stress model (Lazarus & Launier, 1981, Lazarus 1991)
- The Salutogenetic Model and sense of coherence approach (Antonovsky, 1979, 1987, 1997)
- The Theory of conservation of resources (Hobfoll, 1989)
- The Resource- and solution oriented approach (de Shazer, 1990)
- The Concept of Optimism (Carver & Scheier,1985)
- The PERMA Model (Seligman, 2012)
- The identity approach (Keupp & Höfer 1997)
- The Emotion regulation approaches (Gross, 2007)
- The social support approach (stress buffer theoretical approach, Cohen & Wills, 1985).

The generally preferred and widely used theoretical model of stress was developed by Schröder and Reschke (2010). The so called "Two circles model" (Figure 1) is a model which based on the action theory applied to the development of health behavior contra stress. In order to have a good stress coping potential it seems to be necessary that a person can use two forms of action regulation:

1. Self-referential regulation processes like self-reflection, inner speech, self-verbalization, and thinking in a cognitive restructuring way in the case of inner strengths and dysfunctional beliefs. Here is also to mention the ability to relax in different way and in the short- and long-term perspective.
2. Regulation to the social and work-related environmental demands: It means competencies and capacities to influence the environment directly; this can be problem solving capacities, resource activation, social support creating activities and future planning.

The used stress model (Figure 1) was described above has two perspectives for the development of stress coping techniques. External regulation needs for instance problem solving skills or social competencies; and internal or auto regulation needs reflexivity and relaxation techniques and skills for emotion regulation.

The interventions for increase of protective factors of personality (Belz-Merk, Bengel, & Strittmatter, 1992) can focus on many perspectives as to detect in the next Table 1.

We would like to discuss at next some theoretical point of views of the quality and evaluation standards of a stress management program in the present. A intervention program today is not only a summary of different exercises which can help the person to develop capacities for better stress coping.

The most important principle of construction of all programs was the use of the basic concept "Optimism vs. Pessimism" of Scheier and Carver (1985). The concept based on the widely accepted definition of Scheier und Carver (1985) optimism-pessimism as generalized expectancies concerning future events. This should be included in all practical exercises and instructions to build a proactive coping style for stress in future living contexts. In a more practical and construction ori-

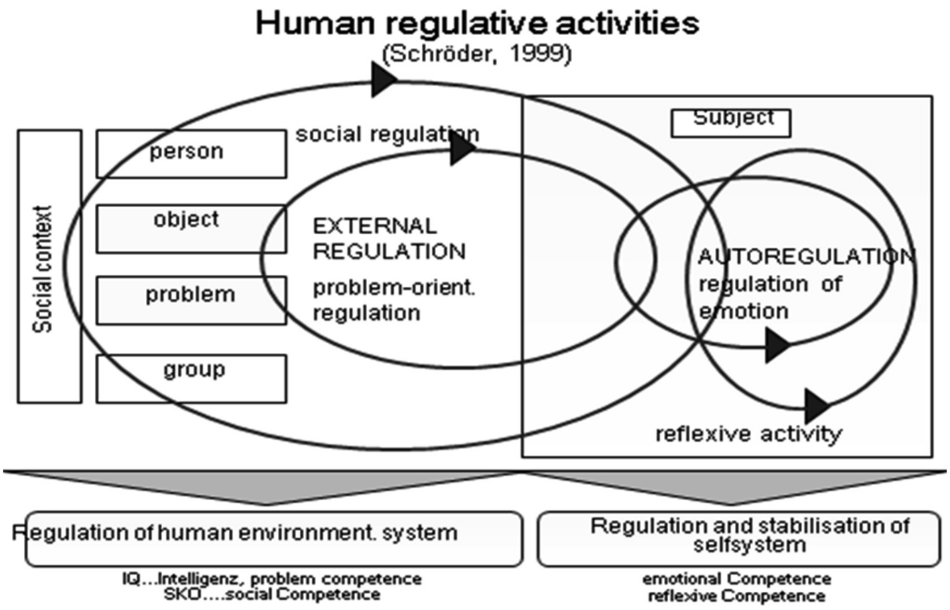

Figure 1 Two circles modelis a model which based on the action theory applied to stress and is from Reschke & Schröder (2010)

Table 1 Taxonomy of protective factors of personality (Belz-Merk, Bengel, & Strittmatter, 1992)

	Sense of coherence	**Hardiness**	**Optimism**	**Mental health**
Locus of control	Comprehensibility, no specific locus of control patterns	Internal locus of control		Autonomy, self-responsibility
Self-efficacy	Confidence in mastering life tasks			Coping with internal and external demands
Outcome Expectancies	no sure success expectancies necessary		Generalized outcome expectancies	
Life sense	meaningfulness, conviction that life has meaning	Commitment, to see things as meaningful		Finding meaning
Future orientation	manageability, conviction to be able to master life tasks in the future as well		Optimistic attitude, expectation of positive future	Confidence, optimism
Coping with transitions, changes of life and life tasks	Predictability, stability of the external and internal world	Confidence, even in case of failure; Challenge, curiosity about life		Ability to cope with life requirements and difficulties

ented perspective in the construction process of all programs we oriented on:

1. Multi-methodize format: A modern stress management program can not only focus on relaxation or simple stress reducing factors.
2. Easy to understand cognitive behavioral approaches of all exercises: The most used theoretical model for stress management is the behavioral approach of the modern cognitive-behavioral therapy approach (CBT) of the third wave of development of CBT (Michalak, 2013).
3. Flexible-manualized: Every modern intervention program must be flexible on the one hand, and on the other hand it must have a manual for description of the use and special aspects of all instructions for the users. Flexibility means that a program must be suitable for the adaption to special target groups, special uses and age and gender necessities.
4. A structured and modularized construction plan: The structure of a intervention program must consist of different modules which are well organized to develop stress management abilities to the participants of a program.
5. Flexible to use and age- and target group-adapted exercises: The flexibility of a program should be given by the possibility to use the exercises and instructions to many different age and target groups. In this concern the basic program "Mastering stress optimistically" can be used in the age scope from 16 to 65 years. The program "Mastering stress of retirement optimistically" starts which the age of about 50. And the program "Stay optimistic cool" was designed for the age-group 13 to 17.
6. The basic-program can be supported by free to choice modules: Special target groups and special types of stress can make is necessary to include special knowledge, target oriented
7. The social resource activation between the participants should be promoted by interactive exercises and social sharing possibilities

All the programs which we developed should have the impact of modern psychological intervention programs that means that they must have under consideration some important principles of construction of interventions. All the programs should fulfill the high standards of a proved psychological intervention programs that are:

- Theoretical background oriented at clinical, health psychological and prevention research standards,
- Multimodal structure,
- Flexible-manualized use,
- Content specificity and broad variety of self-assessment tools/ exercises, specified for the addressed target groups,
- Formatted for variable use in practice,
- Positive results of evaluation studies and in re-evaluations studies after 10 to 15 years,
- Publication of a trainer's manual and participant's booklet,
- Translational activities for wide use in practice,
- Train the trainer opportunities.

3 Description of the program family designed for stress management

The program family consist of four programs up to now: 1. Mastering stress optimistically, 2. Mastering the driver's stress, 3. Mastering retirement optimistically and 4. Stay optimistic cool. It is planned to create a further program called 5. Mastering parenting stress optimistically. The description of the programs will be given in a short and in a comprehensive format.

3.1 Mastering stress optimistically

The basic program was developed in the 90ies after reunification of Germany, it was obviously that common stress management programs for health promotion which were only behaviorally determined worked insufficient and higher dropout rates as usual of participants took place. A health insurances reflected this disadvantage and proposed to Dept. of Psychology of the Leipzig University to develop a new stress management program which covers the health hazards of the social transformation and transitions of time by new health- and personality psychology conceptions. Such a basic program with inputs from Health Psychology, Personality Psychology and Positive Psychology was created by Reschke & Schröder (2000, 2010).

3.2 Mastering the driver‘s stress

Stress and driving can be a stressful relation (Gulian, Matthews, Glendon, Davies & Debney (2007), Kranich & Reschke (2021), Reschke & Kranich (2022). The intervention program "Optimistically coping with driver stress" is a program that builds on the fundamentals of the general health promotion program "Optimistically coping with stress" (Reschke & Schröder, 2010) and has professional drivers in particular as its target group. This profession is associated with considerable work-related and personal stress factors for experiencing stress. The aim of the program is to show this professional group how to adequately deal with stress and stress in road traffic and to practice stress management skills. It therefore comprises various building blocks and modules, from stress analysis to relapse prevention. The program development started in the year 2009. The stress management program "Optimistically coping with drivers stress" is a target group-specific further development of the program "Optimistically coping with stress" (Reschke & Schröder, 2000). The developmental work was carried out in the years 2009 to 2012 (Reschke, Gellert & Kranich, 2009; Kranich, Lohse & Reschke, 2012).
The aim of the program is to show the participants of the course how to adequately deal with stress and stress in road traffic and to practice coping strategies. They should be enabled to drive in an adequate, situation-appropriate and safety-promoting manner. These interventions are thus directed at the personal level. The program does not contain any approaches to a proportionate prevention of stress in road traffic, but it does sensitize the participants to it. The aim is to impart the broadest possible repertoire of stress management skills for road traffic to the participants.

Single goals are:
- Psycho-education, information, counseling
- Generation of motivation to change
- Individual problem analysis
- Recognizing and changing habits
- Learning to control oneself through introspection and self-verbalization
- Exploration of dysfunctional stress management behavior
- Resource activation and analysis
- Detection of risky behavior
- Dealing with conflict situations
- Identification of alternative behavior
- Teaching relaxation techniques
- Transfer protection and relapse prevention

The target groups of the program "Optimistically coping with driver's stress" include all frequent drivers (e.g. commuters) and above all professional drivers. These are, for example, truck drivers in local and long-distance traffic, bus drivers, taxi drivers, post and parcel delivery services, driving instructors, etc. This program is also intended for all drivers who have become suspicious of delinquent driving behavior, but also for drivers who would like deal adequately with stress of their professional life and want to learn to experience reduced stress in traffic. Each participant should have adequate communication skills.
The program is not suitable for participants who are acutely mentally ill. Likewise, people with a strong tendency towards deviance and inadequate awareness of rules and defenses against changes in behavior and a lack of openness to learning in groups should not belong to the target group.
First and foremost, the program is an aid to stressful drivers who have a personal interest in changing their situation. It is suitable for the use of special traffic psychological intervention measures (for example, preparatory measures for the medical-psychological examination, the so-called MPU) for drivers who are delinquent in traffic and who have problems with their points. It can also be used as part of a rehabilitation measure for this group of drivers. Furthermore, the program can be used in the preventive health-promoting area, which is an important aspect for drivers. The preventive approach of the program is also particularly suitable for use in training and further education for professional drivers.
In a formative evaluation it was possible to prove that the program in its conceived form is practicable and can be carried out in this way. The feedback from the participants on the content and implementation of the program was positive; the practical relevance of the intervention content was confirmed by the participants.

3.3 Mastering retirement optimistically

The transition to retirement requires restructuring and readjustment in many areas of life. Changing time structures, role allocations, habits and rituals present couples with the complex task of reorienting their life together. How can a person successfully cope with retirement alone, together, with and without work? Are there successful models? How a stress management program must be to minimize transitional stress?
The developed program "Mastering retirement optimistically" is well designed to help people to solve the above mentioned questions. It is fully modularized with basic modules and choice modules which can be chosen by the participants. It has a trainer manual and participants working material published by Reschke, Neubauer, Krimmenau and Stöber (2022 a, b).
The target groups of the program "Mastering retirement optimistically" includes all people above 60 years who feel under stress about the elderly age or feel stressed by other factors responsible for chronic stress in higher age like illness, loneliness, disintegration or a lack of social support. This program is also intended for all who would like to do health promotion in a proactive way for their lives. By the help of this program people in elderly age can learn to experience short and long-term stress-reducing for everyday use like resource activation

Figure 2 Structure of the program „Stay Optimistic & cool" with Basic- and Choice modules

Stay Optimistic – Cool – The structure

BASIC-MODULES				
Je eine Kursstunde				
FIRST RULE STAY COOL	STRESS CHECK I	STRESS CHECK II	STRESS-ALARM	CHILL OUT
Introducing Phase	Symptom-Check	Thought-Check	Emotions-Check	Rexation-Check

CHOICE-MODULES		
Je zwei bis drei Kursstunden		
RELAXATION	PROBLEM SOLVING	IDENTITY AND FUTURE
• Autogenes Training • Progressive Muskelrelaxation • Benson-Relaxation-Technik • Kurzentspannung • Entspannung zu Hause (Hinweis-Schild basteln) • Regeln und Ziele	• Allgemeines Modell (Psychoedukation) • Beispiel • Eigene Beispiele • Ergebniskontrolle • Ziele	• Allgemeines Modell • Wer bin ich • Meilensteine meines Lebens • Meine Stärken (Detektivspiel) • Zukunft/Ziele

or mindfulness. Each participant should have adequate communication skills and should not be chronically mental ill. The program is not suitable for participants who are acutely mentally ill.

3.4 Stay optimistic cool

The program was published by Reschke, Schley and Redemann (2023). The target groups of the program "Stay optimistic and cool" includes all young people from 13 to 17 years who would like learn about stress to reduce the own risks. These are, for example, young people in transitions to higher schools, in sensible phases of their lives or in difficult living conditions in their schools or families. This program is also intended for whole classes and spare time or project time activities in schools. It is made for pupils and students in schools who would like to deal adequately with stress. Each participant should have adequate communication skills. The program is not suitable for participants who are acutely mentally ill. The structure of the program is to see in figure 2.

3.5 Mastering parenting stress optimistically

In addition to common stress factors like time constraints, multi-tasking, ill-equipped surroundings, lack of resources or funds, financial pressure, demands upon performance (Reschke & Schroeder, 2010), role specific stressors apply to parents. Mikolajczak, Gross & Roskam (2019) reviewed studies about parenting stress and parenting burn-out and identified problems in family functioning and characteristics of parenting style to have large overall effects on particularly low parental resources. Because parents are less able to distance themselves from everyday stressful interactions with their children, the improvement of these interactions needs to be a focus of stress management training for parents (Stöber, 2022).

For this article we define parenting stress (adapted from Deater-Deckard, 1998 and Lazarus & Folkman, 1984) as: The psychological reaction to an individual's appraisal of the balance or imbalance between demands perceived by a parent (e.g. situational demands, financial or time burdens, expectations of others and self) and a parent's resources.

There are not so many stress management trainings for parents. The goals of stress management for parents are to lose their own anxiety about fixed rules and move towards recognizing and approaching their child as an individual with needs and motives. They should contingently do so with cooperation, communication and, above all, responsiveness. Young peoples' socialization is fostered best of they are offered reciprocity and being taken seriously by adults who observe and react, who support by providing needed information, structure and explanation, free from acting out of pressure, anxiety or stress.

Reschke & Schröder (2010) posit that health and illness are influenced by emotions, compensating behavior and physiological responses to the balance between demands, values/motives/needs, skills and resources of a person. A stress management training for parents needs to take this into account by providing generic stress reduction approaches aimed at decreasing demands (e.g. an analysis of stressors), by reflecting personal or societal norms/values/needs, by building resources (e.g. social contacts, emotion regulation, identity) and by offering a specific skills training aimed at preventing and reducing parent-child interaction problems. Poehlmann-Tynan et al. (2019), for example, showed that cognitive behavioral group interventions aimed at parental compassion have a decreasing impact on children's cortisol levels.

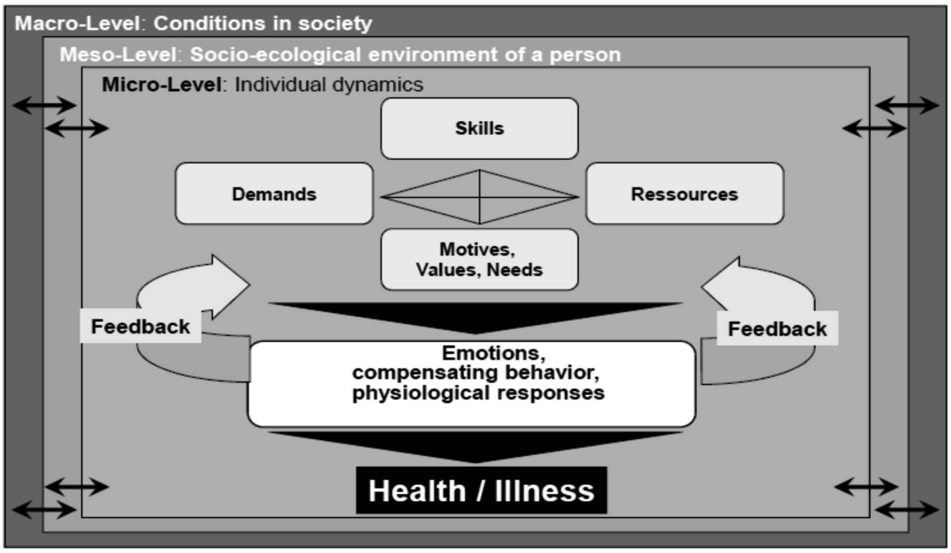

Figure 3 The 4+1 factor-model of health and illness (adapted from Reschke & Schröder, 2010)

It is our belief that all parents should potentially have access to the training program. Therefore, we aimed at integrating the components outlined above into a stress reduction and stress management training curriculum that is open to all parents in Germany. The existing and publically funded stress management training "Mastering stress optimistically" (Reschke & Schroeder, 2010) provided the blueprint for the course structure. It was important to adapt the generic stress management modules only slightly and to leave the session structure comparable, because these have proven to be economic and effective. Modules parenting skills, responsiveness and rational thought pattern, were newly developed. Mastering parenting stress optimistically is a ten module, weekly group training. Each module is scheduled to last for approximately 90 minutes. Trained tutors instruct parents of either younger children or older children in a friendly, structured, welcoming setting by initiating self-reflection, exchange, knowledge- and skills transfer.

The modules of the program include:

- Module 1: Introduction & stress models
- Modules 2 and 3: Reflecting individual stressors – Part I and Part II
- Modules 4, 5 and 6: Resource training: Responsiveness or Modeling rational thought patterns
- Module 7: Social support
- Module 8: Positive emotions and enjoyment
- Module 9: Management of negative emotions
- Module 10: Identity and future goals

4 Selected evaluation results

Additionally we can report at first that we developed an own stress screening assessment instrument – The "Leipziger Kurzfragebogen für Chronischen Stress (LKCS)" (Reschke & Mätzchen, 2020). All evaluation studies which we have done in the past show the program works well with a good affectivity and performance. All programs were accepted by the participants and have developed long term and sustainable impacts to cognitions and behavior related to stress. All studies showed us, we are on a right way in construction of new programs for special target groups against stress and for better resistance and resiliency in the struggle against stress.

Different studies for effectiveness were carried out from 1996 up to 2018 and we used in all studies accepted stress scales with high validity and reliability scores to obtain the results. Furthermore we used different research plan designs, not only prae-post design bus also controlled trail and waiting group design and single subject designs in order to explore qualitative data. Many results could show us the acceptance of the training results and the use of learned coping techniques in long time after finishing the course. Especially good power analysis results showed us that the emotion regulation resources improved in the direction of reduction of anger in, anger out and increase of anger control. Significant changes in experiencing and behavior in stress related situation were reported. Also in a one year follow up assessment 85 % of the participants recommended the stress management program, 74 % used techniques more often in the month and reported about positive transfer in everyday life.

Middle and high effect sizes were found in the effect analysis for

- Ability to have distance to stressing work conditions
- Offensive Problem Solving
- Positive Self instruction
- Lower degree of Self-defeating behavior in stress
- active search for relaxation and regulation
- decrease of Anger in
- number of symptoms of stress
- Inner silence
- Increase of life satisfaction and mental health

Overall we reached positive results: increase of stress-reducing attitudes and behavior pattern in many effect sizes. And, a good result was, that the participants reported they learned different instrumental and palliative techniques of stress coping and developed the ability for a flexible use of the different learned stress coping techniques. For us now, all our results shows us that with the approach of our stress management programs stress-relevant cognitions and behavior can be changed in a positive way.
The main features of the all programs are: Optimism, Mindfulness, different ways and flexibility in the use of stress – coping.

5 Future work and limitations

By all reported classic ingredients of stress management programs we can draw the attention to important new aspects in the development of stress prevention approaches, so:

- A Systematic stress check up
- A powerful stress screening „Leipzig short questionnaire for chronic stress“ LKCS
- Modern emotion regulation approach
- Broad scope of identity research based exercises
- Application of the concept of future orientation

We have to collect more date to continue the evaluation process and have to analyze the levels of stress in our target groups. Depending of the necessities we have to do changes and try to repeat the evaluation studies after every 10 to 15 years.
In the near future we see the following tasks for further development of our approaches:

- A more consequent implementation of the mindfulness concept in the trainings,
- The implementation of the HAPA-Model of Schwarzer (2016) at the end of a stress management program (“My health project”),
- Further development and publication of the Program: „Mastering parenting stress optimistically“,
- Support of translation in other language and cultural contexts,
- Building of easy to use training approach for course instructors.

6 Conclusion

We hope, our approach and the developed methods will further distributed in Germany and abroad. The first translations in the Russian language and in Portuguese language were published. For discussions, presentation of our findings and experiences and for further dissemination and processes to train the trainers, to translate the programs in other languages and to implement the programs in other areas of stress we wait for your signals.
Stress management will also be furthermore an often used psychological tool in context of health promotion in different contexts. We wish to include more positive psychological knowledge in the health promotion approaches regarding to stress (Seligman, 2012).

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The Impact of Stress, Well-being and Mindset on Secondary School Students during the COVID-19 Pandemic

Adriana Simões Félix[a], Adelinda Araújo Candeias[b]

REVIEWED
Marcus Stueck
Sebastian Müller-Haug
Int. Biocentric Research Academy/IBRA

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Martina Goth

AFFILIATION
a Comprehensive Health Research Centre (CHRC), Universidade de Évora, Évora, Portugal
Orcid: 0009-0001-8377-214X
b Departamento de Ciências Médicas e da Saúde, Escola de Saúde e Desenvolvimento Humano, Universidade de Évora, Évora, Portugal. Comprehensive Health Research Centre (CHRC), Universidade de Évora, Évora, Portugal
Orcid: 000-0002-9489-8880

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CORRESPONDENCE
Adelinda Araújo Candeias
Departamento de Ciências Médicas e da Saúde, Escola de Saúde e Desenvolvimento Humano
Universidade de Évora
Largo dos Colegiais 2
Apartado 94
7002-554 Évora, Portugal.
email address: aac@uevora.pt

Open access Journal, Download:
www.bionet-research.com
www.schibri.de

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ABSTRACT

The COVID-19 pandemic has had a profound impact on the lives of secondary school students, affecting their well-being, mindset, and levels of stress. This paper explores the multifaceted ways in which the pandemic has influenced these aspects of students' lives, including the transition to remote learning, social isolation, increased academic pressure, and disrupted routines. Additionally, the paper examines the potential long-term consequences of these stressors on students' mental health and academic performance. Finally, we describe strategies and interventions that can support students' well-being and resilience during these challenging times.

KEYWORDS

Well-being, Stress, Pandemic, Mindset, High School Students

Introduction

The COVID-19 pandemic has disrupted education systems worldwide, requiring secondary school students to adapt to remote learning and overcome the unique challenges posed by the pandemic. This abrupt transition has resulted in a variety of stressors that affect students' well-being, mindset, and overall academic performance. The following sections aim to delve into specific ways in which the pandemic has affected secondary school students. Additionally, we will explore the potential long-term consequences on their mental health and academic outcomes.

Transition to Remote Learning

The closure of schools and the shift to remote learning have presented significant challenges for secondary school students. The sudden change in learning environment, limited social interaction, and reliance on technology have disrupted their routines and increased feelings of stress and anxiety. Students may struggle with self-motivation, lack of structure, and difficulties in adapting to online platforms. The lack of face-to-face interaction with teachers and peers can also impact their sense of belonging and overall well-being.

Social Isolation and Loneliness

The implementation of social distancing measures has led to increased social isolation among secondary school students. The lack of in-person interaction with peers and limited opportunities for extracurricular activities and social gatherings have had a negative impact on their mental well-being. Feelings of loneliness, depression, and anxiety have become prevalent, further exacerbating the stress experienced by students during the pandemic (Mosanya, 2020).

Increased Academic Pressure

The COVID-19 pandemic has imposed additional academic pressures on secondary school students. The shift to remote learning, coupled with the uncertainty surrounding exams and grading systems, has intensified the competition for academic success. Students may feel overwhelmed by increased workloads, difficulty in accessing educational resources, and challenges in maintaining focus and motivation. The fear of falling behind and the pressure to meet academic expectations can significantly contribute to heightened stress levels among students (de la Fuente et al., 2021).

Disrupted Routines and Coping Mechanisms

The pandemic has disrupted the daily routines of secondary school students, leading to a loss of structure and stability in their lives. Disruptions to sleep patterns, meal schedules, and physical activity can negatively impact their overall well-being (Di Renzo et al., 2020). Additionally, students may experience challenges in managing stress and coping with uncertainty, as their usual coping mechanisms such as socializing with friends or participating in extracurricular activities may no longer be available or limited.

Long-term Consequences on Mental Health

The prolonged exposure to stressors during the COVID-19 pandemic can have lasting effects on the mental health of secondary school students. Studies have shown an increase in anxiety disorders, depression, and post-traumatic stress symptoms among students. The uncertainty surrounding the future, disrupted social connections, and academic pressures can contribute to a decline in mental well-being (Hagger et al., 2020). It is crucial to recognize these long-term consequences and implement appropriate support systems to address the mental health needs of students.

Academic Performance and Learning Loss

The disruptions caused by the COVID-19 pandemic have also affected secondary school student's academic performance. Remote learning may not provide the same level of engagement and effectiveness as traditional classroom settings, leading to potential learning loss and academic gaps (Byrne et al., 2007; Kaplan et al., 2005). Additionally, the disparities in access to technology and resources among students have further exacerbated these challenges. It is important to consider the long-term consequences of these disruptions on students' educational outcomes and implement targeted interventions to mitigate the impact.

Strategies and Interventions for Well-being and Resilience

Supporting the well-being and resilience of secondary school students during the pandemic is vital. Various strategies and interventions can be implemented to mitigate the negative impact of stress and promote positive mental health outcomes. These may include providing access to mental health services, fostering social connections, promoting self-care practices, and implementing flexible and inclusive educational approaches.

1 The Impact of Stress on Secondary School Students during the Pandemic

1.1 Psychological Effects of Prolonged Stress

Prolonged exposure to stress during the COVID-19 pandemic has significant psychological effects on secondary school students. Research studies (Reese et al., 2020) have shown that the atypical circumstances of the pandemic subject individuals to prolonged stress, which can have negative effects on their physical and mental health, increasing the risk of various health issues (Cohen et al., 2007; Kuo et al., 2019; Wu et al., 2005). These effects may include increased anxiety, depression, sleep disturbances, and impaired physical health.

1.2 Isolation and Emotional Distress

The implementation of social distancing measures has resulted in isolation among secondary school students, leading to emotional distress and compromised mental and physical health. Studies (Ditommaso et al., 2004; Goodwin et al., 2001) have shown that prolonged social distancing measures during the pandemic can result in emotional distress, compromised mental and physical health, and impaired cognitive abilities. Students may experience feelings of loneliness, detachment, and a lack of social support, contributing to elevated stress levels.
1.3 Academic Pressures and Disruptions
Secondary school students have faced significant disruptions to their education and daily lives during the pandemic. The sudden transition to remote learning, limited social interactions, and the absence of traditional extracurricular activities have created additional stressors. Studies (Elmer et al., 2020) have highlighted the challenges of remote learning, including difficulties in adapting to virtual platforms, managing time effectively, and maintaining motivation and focus. The blurring of boundaries between school and home, increased screen time, and potential distractions have further added to the stress experienced by secondary school students during this pandemic.

2. Well-being

2.1 Defining Well-being

Well-being, encompassing both physical and psychological components, is crucial for the development of secondary school students. Well-being is defined as the harmony among mental, physical, spiritual, and emotional components (Candeias, 2019). It is important to recognize the importance of subjective well-being, which enables the identification of personal satisfaction or happiness levels, and psychological well-being, which emphasizes personal satisfaction and happiness within specific psychological domains and the psychological resources available to individuals (Ryff, 1989b).

2.2 Psychological Well-being and Its Dimensions

Psychological well-being plays a vital role in the academic performance and adaptability of secondary school students. It is based on an individual's psychological resources, including cognitive, affective, and emotional processes. Carol Ryff's model of psychological well-being (1995) identifies six central dimensions of positive psychological functioning: self-acceptance, positive relations with others, environmental mastery, personal growth, purpose in life, and autonomy. These dimensions contribute to an individual's overall psychological well-being.

3 The Role of Mindset in Navigating Pandemic Challenges

3.1 Understanding Mindset

Mindset, encompassing both growth mindset and fixed mindset, influences how secondary school students navigate challenges during the pandemic. A growth mindset is characterized by the belief that abilities and intelligence can be developed through effort, practice, and learning from failures. In contrast, a fixed mindset believes that abilities and intelligence are fixed traits. Research (Dweck, 2006) has shown that a growth mindset fosters resilience, adaptive thinking, and the ability to overcome challenges, while a fixed mindset may hinder students' ability to cope with uncertainties and disruptions.

3.2 Fostering a Growth Mindset

Fostering a growth mindset among secondary school students is crucial for their well-being and academic performance during the pandemic. Strategies such as promoting effort and perseverance, encouraging a positive learning environment, and providing constructive feedback can help cultivate a growth mindset. Research (Yeager & Dweck, 2012) has shown that students with a growth mindset are more resilient and persistent, using setbacks as learning opportunities and seeking strategies to overcome challenges.

4 Addressing the Impact: Strategies and Interventions

4.1 Stress Management Techniques

Implementing stress management techniques can help secondary school students cope with the impact of stress during the pandemic. Techniques such as mindfulness exercises, deep breathing, physical exercise, and engaging in hobbies or creative outlets have been shown to be effective in reducing stress levels. These techniques promote relaxation, self-awareness, and emotional regulation, providing students with valuable tools to manage stress. Additionally, providing students with access to mental health services and promoting social support systems are essential components of effective stress management strategies, fostering a supportive environment for students to seek help and connect with others (Rith-Najarian et al., 2019, Kamaran et al., 2019; Pascoe et al., 2020). By implementing these techniques and support systems, secondary schools can better support students in navigating and coping with the challenges of the pandemic.

4.2 Promoting Well-being

Creating supportive environments that promote well-being is crucial for secondary school students during the pandemic. Strategies such as fostering positive relationships, encouraging social connections, and promoting self-care practices can contribute to their overall well-being. School connectedness, sense of belonging, and access to mental health support play vital roles in promoting well-being among students (Carol Ryff, 1995).

4.3 Fostering a Growth

Mindset Educational approaches that foster a growth mindset can empower secondary school students to navigate pandemic challenges with resilience and adaptability. Incorporating growth mindset principles into teaching practices, encouraging students to embrace challenges, and providing opportunities for learning from failures can contribute to their growth and development (Yeager & Dweck, 2012). It is important for educators to create a positive and supportive learning environment that nurtures a growth mindset.

Discussion

The COVID-19 pandemic has undoubtedly had a profound impact on secondary school students, affecting various aspects of their lives, including their well-being, mindset, and levels of stress. We focus on the challenges faced by students in transitioning to remote learning, such as social isolation, loneliness, increased academic pressure, disrupted routines, and coping mechanisms. In addition, we take into consideration the potential long-term consequences on students' mental health and academic outcomes. We also propose strategies and interventions to support the well-being and resilience of secondary school students during these challenging times.

One significant area of impact discussed in this paper is the transition to remote learning. The sudden change in the learning environment, limited social interaction, and reliance on technology have disrupted their routines and increased feelings of stress and anxiety. Students may struggle with self-motivation, lack of structure, and difficulties in adapting to online platforms. The lack of face-to-face interaction with teachers and peers can also impact their sense of belonging and overall well-being (Reese et al., 2020).

The implementation of social distancing measures has resulted in increased social isolation among secondary school students. The lack of in-person interaction with peers and limited opportunities for extracurricular activities and social gatherings have had a negative impact on their mental well-being. Feelings of loneliness, depression, and anxiety have become prevalent, further exacerbating the stress experienced by students during the pandemic (Ditommaso et al., 2004; Goodwin et al., 2001; Mosanya, 2020).

The COVID-19 pandemic has imposed additional academic pressures on secondary school students. The shift to remote learning, coupled with the uncertainty surrounding exams and grading systems, has intensified the competition for academic success. Students may feel overwhelmed by increased workloads, difficulty in accessing educational resources, and challenges in maintaining focus and motivation. The fear of falling behind and the pressure to meet academic expectations can significantly contribute to heightened stress levels among students (Elmer et al., 2020).

The daily routines of these students were also disrupted by the pandemic, resulting in a loss of structure and stability in their lives. Disruptions to sleep patterns, meal schedules, and physical activity can negatively impact their overall well-being. Additionally, students may experience challenges in managing stress and coping with uncertainty, as their usual coping mechanisms such as socializing with friends or participating in extracurricular activities may no longer be available or limited (Reese et al., 2020).

The prolonged exposure to stressors during the COVID-19 pandemic can have lasting effects on the mental health of secondary school students. Studies have shown an increase in anxiety disorders, depression, and post-traumatic stress symptoms among students. The uncertainty surrounding the future, disrupted social connections, and academic pressures can contribute to a decline in mental well-being. It is crucial to recognize these long-term consequences and implement appropriate support systems to address the mental health needs of students (Cohen et al., 2007; Kuo et al., 2019; Wu et al., 2005; Hagger et al., 2020).

The disturbances caused by the COVID-19 pandemic have also affected secondary school students' academic performance. Remote learning may not provide the same level of engagement and effectiveness as traditional classroom settings, leading to potential learning loss and academic gaps. Additionally, the disparities in access to technology and resources among students have further exacerbated these challenges. It is important to consider the long-term consequences of these disruptions on students' educational outcomes and implement targeted interventions to mitigate the impact (Elmer et al., 2020).

To address the impact on secondary school students, we suggest strategies and interventions for well-being and resilience. Implementing stress management techniques, such as mindfulness exercises, deep breathing, physical exercise, and engaging in hobbies or creative outlets, can help students cope with the impact of stress during the pandemic. Providing access to mental health services and promoting social support systems are also essential components of effective stress management strategies (Rith-Najarian et al., 2019; Kamaran et al., 2019; Pascoe et al., 2020).

Creating supportive environments that promote well-being is crucial for secondary school students during the pandemic. Fostering positive relationships, encouraging social connections, and promoting self-care practices can contribute to their overall well-being. School connectedness, a sense of belonging, and access to mental health support play vital roles in promoting well-being among students.

Furthermore, fostering a growth mindset among secondary school students is crucial for their well-being and academic performance during the pandemic. Strategies such as promoting effort and perseverance, encouraging a positive learning environment, and providing constructive feedback can help cultivate a growth mindset. Students with a growth mindset are more resilient and persistent, using setbacks as learning opportunities and seeking strategies to overcome challenges (Yeager & Dweck, 2012).

Conclusion

In conclusion, the COVID-19 pandemic has had a significant impact on secondary school students, affecting their well-being, mindset, and stress levels. The discussion emphasizes the significance of addressing these impacts by implementing targeted strategies and interventions that prioritize students' mental health, foster resilience, and support academic progress. By acknowledging the unique challenges presented by the pandemic and fostering collaboration, as evidenced by the referenced studies, we can establish a supportive and nurturing environment for secondary school students. Assisting them in navigating these unprecedented times will help them emerge stronger and more resilient in the face of adversity.

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Psychological Well-being and Lifestyles in Higher Education Students during a Pandemic Crisis

Carolina de Cristina Silva[a], Adriana Simões Félix[b], Adelinda Araújo Candeias[c]

REVIEWED
Marcus Stueck
Sebastian Müller-Haug
Int. Biocentric Research Academy/IBRA

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EDITED
Martina Goth

AFFILIATION
a Comprehensive Health Research Centre (CHRC), Universidade de Évora, Évora, Portugal
Orcid: 0000-0003-0459-6721
b Comprehensive Health Research Centre (CHRC), Universidade de Évora, Évora, Portugal
Orcid: 0009-0001-8377-214X
c Departamento de Ciências Médicas e da Saúde, Escola de Saúde e Desenvolvimento Humano, Universidade de Évora, Évora, Portugal. Comprehensive Health Research Centre (CHRC), Universidade de Évora, Évora, Portugal
Orcid: 000-0002-9489-8880

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CORRESPONDENCE
Adelinda Araújo Candeias
Departamento de Ciências Médicas e da Saúde, Escola de Saúde e Desenvolvimento Humano, Universidade de Évora
Largo dos Colegiais 2
Apartado 94
7002-554 Évora, Portugal.
email address: aac@uevora.pt

Open access Journal, Download:
www.bionet-research.com
www.schibri.de

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ABSTRACT

The aim of this study is to explore the interconnections between stress, mindset, lifestyle changes, and the experiences of university students during the COVID-19 pandemic. The COVID-19 pandemic disrupted people's lifestyles, impacting habits and behaviors. University students faced challenges adjusting to new routines due to safety measures like social distancing and confinement. Changes affected sleep patterns, diet, and physical activity, influencing overall psychological well-being. Stress levels were heightened due to uncertainties in academic progress and concerns for personal health and safety. Mindset played a vital role, with a growth mindset enabling better coping strategies. Lifestyle changes included altered sleep schedules, increased screen time, and reduced physical activity. Some students improved their diets, while others made unhealthy food choices. These changes had significant effects on mental health, with increased stress, anxiety, and depression. Providing tailored support, mental health counseling, virtual events, and promoting healthy habits are essential to support students' well-being during the pandemic.

KEYWORDS

Psychological well-being, Coping and COVID-19, Higher education and COVID-19

Introduction

The COVID-19 pandemic has had a profound impact on various aspects of life worldwide. People have been forced to adapt to new rules and measures aimed at controlling the virus's spread (Vieira et al., 2020). This individual adaptation varies due to inherent factors unique to each person. Catastrophic events, such as pandemics, can take various forms, from natural disasters to human-made emergencies, characterized by risk and unpredictability. These crises profoundly affect the lives, well-being, and psychological health of those who experience them (Carvalho & Matos, 2016; Ferreira & Sant'ana, 2018; Paranhos & Werlang, 2015). In response to such events, the field of Disaster Psychology emerges, aiming to mitigate the psychological impact of these events.

The situations that fall within these categories not only promote stress in individuals but also challenge their physical and psychological well-being indefinitely. The damages caused by such occurrences affect both the individuals who experience them and their families and associates. Crisis situations may lead to various types of psychological trauma (temporary or permanent), acute and/or post-traumatic stress, grief, depressive symptoms, suicidal or violent behaviors, substance abuse, among others, necessitating psychological support to restore balanced well-being (Paranhos & Werlang, 2015).

The emergence of the COVID-19 virus in late 2019 led to a global epidemiological crisis. The effects of this pandemic were quickly noticeable across the world's population. Initially, most individuals were overwhelmed with fear and uncertainty due to the limited information, unpredictable nature of the virus, and its potential consequences on both an individual and a national level. Over time, new perspectives on the infection and its consequences have emerged, giving rise to a range of associated emotions. As mentioned before, each individual interprets the current situation differently, leading to different coping strategies to deal with the recent changes in daily life.

This study aims to explore the relationship between mindset and stress and well-being in a population of college students. Additionally, it seeks to understand how the experiences of the pandemic are related to the lifestyles of these students.

Impact of COVID-19 Pandemic on Psychological Health and Adaptation

The COVID-19 pandemic has had a significant impact on various aspects of life globally. Individuals are forced to adapt to new rules and measures related to virus control, leading to individual adaptations that vary due to inherent factors (Vieira et al., 2020). Situations of disaster, including pandemics, can be of different origins and are characterized by risk and unpredictability, affecting the lives, well-being, and psychological health of those experiencing them (Carvalho & Matos, 2016; Ferreira & Sant'ana, 2018; Paranhos & Werlang, 2015). In this context, the field of Disaster Psychology emerges to mitigate the psychological impact of such events (Paranhos & Werlang, 2015). These crises can lead to various psychological traumas, stress, depression, and other mental health issues, necessitating psychological support to restore balanced well-being (Paranhos & Werlang, 2015).

Psychological Well-being and Its Components

Psychological well-being is a concept that has evolved over time, currently associated with the idea of quality of life. It encompasses various components, such as positive emotions, life satisfaction, and purpose, and is influenced by individual values, beliefs, and social relationships (Berlin, 2019; Contente, 2012; Ferreira, 2015; Figueiras, 2017). Psychological well-being can be viewed through two perspectives: Subjective Well-being and Psychological Well-being. The latter focuses on personal growth, positive relationships, autonomy, purpose, and self-acceptance (Berlin, 2019). Students in higher education face academic, social, and personal challenges that affect their psychological well-being, and academic performance and satisfaction can influence overall well-being (Figueiras, 2017).

The Role of Mindset in Psychological Well-being and Coping Strategies

Mindset refers to an individual's beliefs and values, influencing cognitive and emotional capacities. There are two main types of mindsets: Fixed Mindset and Growth Mindset (Burnette et al., 2020; Dweck, 2018; Berlin, 2019; Mosanya, 2020). The Growth Mindset is associated with resilience and adaptive coping strategies, leading to higher levels of psychological well-being. Students with a Growth Mindset tend to perform better academically, show higher self-esteem, and are more likely to persevere in challenging situations (Berlin, 2019). During the pandemic, individuals with a Growth Mindset are expected to use more effective coping strategies to face the crisis (Mann et al., 2018). Understanding the relationship between mindset, stress, and well-being in higher education during the pandemic is a crucial goal for the present study.

Psychological Stress and its Impact during the COVID-19 Pandemic

The COVID-19 pandemic has induced stress and anxiety in individuals due to the uncertainty and fear of infection. Stress arises when external demands exceed individual coping capacities, leading to psychological and biological changes (Oura, Moreira, & Santos, 2020; Wahed & Hassan, 2017). In the context of higher education, students face additional stressors related to academic performance and transitions. Stress can have negative consequences on mental health and well-being, leading to symptoms of depression and even academic disengagement (Bedewy & Gabriel, 2015; Wahed & Hassan, 2017).

The Role of Mindset in Coping with Pandemic Stress

Mindset plays a crucial role in determining how individuals respond to adverse situations, including crises like the pandemic. The type of mindset (Fixed or Growth) influences coping strategies and emotional responses during challenging times (Almazan et al., 2019). Students with a Growth Mindset are more likely to utilize adaptive coping strategies and view the pandemic as an opportunity for personal development (Mosanya, 2020). Research suggests that individuals with a Growth Mindset tend to have higher psychological well-being and are better equipped to face stress and adversity (Burnette et al., 2020).

Changes in Lifestyles and Psychological Processes During the Pandemic

The COVID-19 pandemic has disrupted people's usual lifestyles, leading to changes in habits and behaviors. Individuals faced challenges in adapting to new routines due to the implementation of safety measures like social distancing and confinement (Chopra et al., 2020; Di Renzo et al., 2020; Sinha, Pande, & Sinha, 2020; Vieira et al., 2020). These changes affected sleep patterns, diet, and physical activity, leading to alterations in overall psychological well-being (Chopra et al., 2020; Di Renzo et al., 2020; Sinha, Pande, & Sinha, 2020). The adoption of new habits was influenced by various factors, including exposure to light and digital screens, changes in social routines, and sociocultural factors (Vangeepuran et al., 2020).

During the COVID-19 pandemic, people have been forced to change their usual routines in compliance with the safety measures imposed, especially during mandatory confinement. Although this is a highly current topic and there are not yet many in-depth studies on the subject, the published literature already indicates several significant changes in habits common to all individuals, especially in sleep, eating, and physical exercise.

These changes can occur not only due to the need to adapt to all the imposed changes but also as an individual choice, as there is more time to reorganize routines. However, some changes

may be associated with external factors present in individuals‘ daily lives, such as exposure to natural or artificial light, meal times, or working hours. The changes that occur in these habits can influence individuals‘ health and quality of life (Chopra et al., 2020; Di Renzo et al., 2020; Sinha, Pande, & Sinha, 2020; Vieira et al., 2020). The day-to-day experiences that constitute the lifestyles and habits we adopt have a significant impact on health. Examples include smoking, alcohol consumption, or unhealthy diets. Adopting certain lifestyles and avoiding some habits can contribute to individuals‘ health and even prolong their lives (Bully et al., 2015; Di Renzo et al., 2020).
According to studies by Chopra and colleagues (2020) and Sinha, Pande, and Sinha (2020) on the effects of confinement on personal routines, it can be stated that there are changes in sleep hours, as individuals tend to go to bed and wake up later or reduce the number of hours of sleep compared to a normal period. During confinement, people are exposed to artificial light and digital screens for longer, and outdoor exposure to natural light decreases (Chopra et al., 2020; Sinha, Pande & Sinha, 2020). Artificial light is known for its negative effects on individuals‘ sleep quality, reducing the number of nighttime sleep hours and causing greater daytime fatigue. These consequences happen because of variations in melatonin caused by exposure to artificial light at night. Melatonin is the hormone responsible for signalling the brain about night, darkness, and the associated sleep time. Additionally, the quality of sleep habits can also be influenced by the frequency of physical exercise (Sinha, Pande & Sinha, 2020).
However, there is a reduction in physical activity associated with factors such as increased time spent on digital activities during confinement (Chopra et al., 2020; Di Renzo et al., 2020; Sinha, Pande & Sinha, 2020). Furthermore, the decrease in physical exercise can be attributed to a lack of motivation and time, as well as restricted access to places where physical activities are usually performed.
Eating habits also undergo changes during confinement. According to studies by Chopra and colleagues (2020) and Di Renzo et al. (2020), the majority of individuals change their meal habits, including meal times and quality, similar to the sleep patterns. The literature indicates that part of the population started having their main meals later, while another part created or improved eating routines. During confinement, there are also extreme changes in the quality of individuals‘ diets, as some try to improve the quality of the food they consume, while others start consuming a larger quantity of unhealthy foods (Chopra et al., 2020; Di Renzo et al., 2020; Sinha, Pande & Sinha, 2020). Those who improved their diet justified the change by reducing meals eaten outside the home and associated socialization, preferring homemade food, and fearing infection outside (Chopra et al., 2020).
As a result of the aforementioned changes, the psychological state of individuals also undergoes alterations, increasing the risk of developing dysfunctional behaviors, such as maladaptive eating patterns, as a way to cope with negative responses to confinement (Di Renzo et al., 2020). Moreover, due to confinement and new lifestyles, there is an increase in feelings of stress and anxiety. The main factors that may be associated with differences in psychological well-being are concerns related to family, fear of infection, boredom, loneliness, financial problems, and negative changes in daily habits (Chopra et al., 2020; Di Renzo et al., 2020).
Higher education students are part of a large portion of the population who were forced to change their lifestyles and adapt their daily habits to contingency measures during the confinement period. Besides restrictions on outdoor activities and adaptations of personal space at home, the daily life of higher education students underwent significant changes, as they were also required to switch to remote learning. Changes made in lifestyles, whether during a pandemic or under normal circumstances, have an impact on how students feel and their well-being (Figueiras, 2017). A previous study with higher education students revealed a negative relation between well-being and lifestyle changes during lockdown (Silva, 2022).
This study aims to investigate how confinement and the experience of the current situation brought about changes in the self-perception of higher education students‘ lifestyles and how such changes are interconnected with mindset, well-being, and stress.

Discussion and Conclusion

In conclusion we could say that the COVID-19 pandemic brought unprecedented challenges to individuals worldwide, and university students were no exception. As they faced disruptions to their academic, social, and daily routines, the pandemic significantly impacted their stress levels, mindsets, and lifestyles. This article aims to discuss the interconnections between stress, mindset, lifestyle changes, and the experiences of university students during the COVID-19 pandemic.
Stress among University Students during the Pandemic: The pandemic imposed various stressors on university students. The sudden shift to remote learning, uncertainty about academic progress, and concerns about the health and safety of themselves and their loved ones all contributed to heightened stress levels. Additionally, social isolation, limited opportunities for in-person interactions, and financial worries added to the emotional burden experienced by students.
Mindset and Coping Mechanisms: Mindset plays a crucial role in how university students cope with stress during the pandemic. Those with a growth mindset tend to view challenges as opportunities for growth and are more likely to adapt positively to the situation. On the other hand, students with fixed mindsets might struggle to cope, feeling overwhelmed and unable to overcome obstacles. Nurturing a growth mindset through supportive resources and encouragement can foster resilience and better coping strategies in challenging times.
Lifestyle Changes and Adaptations: The COVID-19 pandemic forced university students to adapt their lifestyles drastically. Changes in daily routines, such as altered sleep patterns due to irregular schedules or increased screen time, impacted students‘ overall well-being. Furthermore, the closure of gyms and restricted access to outdoor activities led to reduced physical activity, which can affect both physical and mental health. Moreover, changes in eating habits, either improved through homemade meals or affected by unhealthy food choices, influenced students‘ nutritional well-being.
Effects of Lifestyle Changes on Mental Health: Lifestyle modifications during the pandemic influenced university students’

mental health. The combination of disrupted routines, reduced physical activity, and altered eating habits can contribute to increased stress, anxiety, and depression levels. These changes may also lead to a sense of isolation and loneliness, affecting social well-being.

Coping Strategies and Support: To mitigate the negative effects of stress and lifestyle changes, universities and institutions can offer tailored support and resources to their students. Providing mental health counseling, virtual social events, and educational workshops on managing stress and maintaining healthy lifestyles can be beneficial. Encouraging communication among students to foster a sense of belonging and community can also alleviate feelings of isolation.

Conclusion: The COVID-19 pandemic profoundly affected university students, triggering higher stress levels, mindset shifts, and lifestyle changes. To promote their well-being, it is essential for institutions to understand and address these interconnections. Supporting students' mental health, encouraging a growth mindset, and promoting healthy lifestyles can contribute to their resilience and overall well-being during these challenging times and beyond.

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Health Psychology and pandemics: What did we learn?

Edgar Galindo

REVIEWED
Marcus Stueck
Sebastian Müller-Haug
Int. Biocentric Research Academy/IBRA

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EDITED
Martina Goth

AFFILIATION
Departamento de Ciências Médicas e da Saúde, Escola de Saúde e Desenvolvimento Humano, Comprehensive Health Research Centre (CHRC), Universidade de Évora, Portugal
Orcid: 0000-0002-0844-3143

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CORRESPONDENCE
edgar_galindo@hotmail.com

Open access Journal, Download:
www.bionet-research.com
www.schibri.de

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ABSTRACT
Health psychology is concerned with cognitive, emotional and behavioral factors affecting physical health and illness. Health and illness are not only biological processes, but at the same time an emotional, cognitive and behavioral process affected simultaneously by cultural factors. Since the middle of the 20th Century, it is known that people who eat regularly, sleep enough, do not smoke and exercise regularly are usually in better health, that stress – a situation with a strong a psychological basis – has an impact on health and illness and that the functioning of the immune system can be altered by learning. This paper explores the psychological factors related to the current COVID-19 pandemic. A first analysis is made on the basis of an extraordinary book, the "Psychology of Pandemics", published by Taylor in 2019, short time before the onset of the current pandemic. Then, a comparison is made of the results obtained by several researchers during the COVID-19 pandemic. In the conclusion, it seems to be clear, that cognitive factors like thoughts and beliefs, cultural influences like family relationships, SES and social support, and behavioral patterns like adherence to rules like social distance and vaccination greatly determine the development of the illness at an individual level, as well as the spread of the disease at a social level.

KEYWORDS
well-being, quality of life, COVID-19, mental health

Introduction

Health psychology deals with the psychological processes contributing to overall individual's well-being and health, i.e., on the one hand, it has to do with the emotional, cognitive and/or behavioral processes intervening in health and disease and consequently with the perception and the actions of the individual concerning the own well-being; on the other hand, it has to do with individual emotional, cognitive and/or behavioral processes affecting health, disease and well-being of other individuals.

The aims of health psychology are the promotion and maintenance of health, the prevention and treatment of illness, and the identification of etiologic and diagnostic correlates of health and illness and, consequently of well-being.

Since the middle of the 20th Century, there is a growing knowledge about factors intervening in the bodily states of health and disease (Belloc & Breslow, 1972). It has been observed, that people who eat regularly, sleep enough, do not smoke and exercise regularly are usually in better health than other. This means that lifestyle – i.e., a set of behavior patterns – has a great impact on health and overall wellbeing of a person. Since then it is clear that many health problems related to serious illnesses like cancer and heart diseases are related to certain, so called "unhealthy" behavior patterns, like smoking, overeating and sedentary habits.

Consequently, the psychological processes participating in the conscious and unconscious control of the body have been subject of growing attention. It has been found, that the functioning of the immune system can be altered by learning. A series of pioneer studies made in rats showed that animals are able to learn the control of heart rate, blood pressure, renal blood flow and the movement of intestines through operant condition procedures (Miller, 1978). In human beings, Kamiya found that a person can learn to control voluntarily alpha or beta brain states (Kamiya, 1969); similarly, Basmajian demonstrated that a person can learn to control a single motor unit with help of visual or auditory feedback (Basmajian, 1967) and Green developed further the procedure to produce relaxation states (Green, 1969). Since then, thousands of investigations have followed, opening biofeedback and self-control as a new area of research and application. Presently, biofeedback is a standard instrument in physical therapy, neuromuscular re-education, and pain treatment, but also in other clinical areas (Schultz,& Luthe, 2018).

At the same time, researchers have been giving growing attention to the close relationship between psychological factors and some concrete diseases. One of the most common studies was carried out by Greer, Morris, Pettingale & Haybittle (1990) with cancer patients, showing that people who adopt a fighting spirit before the diagnosis are more likely to recover than are those who pessimistically suffer and resign themselves to death. Further studies have shown a close association between depression and diseases like Rheumatoid arthritis, Kidney diseases, Chronic pain, Multiple sclerosis, Chronic fatigue, Hypertension, and Irritable inflammatory bowel syndrome; as well as between anxiety and Allergies, Rheumatoid arthritis, Asthma, Skin diseases, Diabetes, Myocardial infarction, Multiple sclerosis, and Chronic fatigue (Joyce-Moniz & Barros, 2005).

A more recent example of this relation is stress. Stress is currently considered a serious public health problem, a main cause for increasing number of body diseases and a source of psychological suffering. It is a state between health and disease strongly associated to emotional, cognitive and behavioral factors affecting daily lives of human beings. In spite of the fact, that stress has a psychological basis, it has an impact on body health through the production of arousal states leaving to a weakness of the immune system and an increasing pressure on the cardiovascular system (Orly, Rivka & Dorit, 2012; Schröder & Reschke, 2010)

It is then clear, that health is not only a biological process, but at the same time an emotional, cognitive and behavioral process (Ogden, 2012). Psychological factors are always taking part in diseases that were once seen in purely physiological terms; they are determining our sense of health, well-being, and happiness. Moreover, they play an essential role in the way in which we act against diseases and epidemies, because – from an individual perspective – it depends on two important behavioral patterns: Following Medical Advice and Adherence vs. Nonadherence. As we will see, these behaviors can be essential to control a pandemic or, unfortunately, to spread it.

The psychology of pandemics

Under this title, Taylor published in 2019, before the COVID-19 disaster, a premonitory book, analyzing the origins, the characteristics and the consequences of pandemics, especially the psychological consequences, as well as the numerous problems to control it. He studies a set of epidemics that devastated humanity in the past, from the infamous Black Death of the Middle Ages (which supposedly exterminated two thirds of humanity), to the still present AIDS epidemic, including the Spanish Flu of the last century and the Zica virus (see Table 1).

Table 1 Notable Pandemics

- Bubonic Plague (1346–1353, killed 50 million people)
- HIV/AIDS (1981 to present),
- Spanish flu (1918–1920),
- Asian flu (1957–1958),
- Hong Kong flu (1968–1969),
- Russian flu (1977–1978),
- Swine flu (2009–2010),
- Zika virus (2015–2016)

With terrifying and surprising foresight, he draws conclusions that he uses to make a series of recommendations to deal with the "next pandemic." He could not have known that many of his conclusions would be fulfilled with astonishing accuracy a few months after the appearance of his book.

First of all, a pandemic is a psychological problem as much as a medical one, says Taylor. Psychological factors like the emotional reactions of the people (anxiety, distress, wrath, mourning), the cognition (understanding of the facts) and the manifest behavioral patterns of the population (e.g., nonadherence, avoidance, following of advices and recommendations) determine deeply the effectivity of the measures to combat the disease. Psychological factors are important in the way in which people 1) Cope with the threat of pandemic and its sequelae (loss of loved ones), 2) Understand and manage societal problems people may fear for their health, safety, family, finances, or jobs), 3) understand and manage reactions as stigmatization and xenophobia. For instance, some people cope well under threat, but some experience high levels of distress or a worsening of pre-existing psychological problems. Other clinical and social psychological factors relevant for understanding pandemics are existing prejudices, the way we name diseases, the role of the media, the attitudes to vaccinations, how rumors are managed, and the always present conspiracy theories.

The warning of Taylor is unbelievable right: The next pandemic can have devastating consequences, because people do not have immunity, effective treatments are not available, people are mobile and live in densely populated cities, hasty communication media can escalate the risk of panic, months would go by before vaccines become available, clinics and hospitals would be overburdened, ther can be a lack of human resources to provide crucial services, due to both the demand and illness. And: Vaccinations, if available, and behavioral methods (hand-washing and social distancing, limiting social gatherings) will be are first-line interventions. Therefore, knowledge of cognition and behavior will be critical for managing or prevention.

Under such conditions, four main methods will be used to manage the spread of infection: (1) Risk communication (public education), (2) vaccines and antiviral therapies, (3) hygiene practices, and (4) social distancing. Psychological factors play an essential role in the success of the above measure, except perhaps vaccines, says Taylor, but even vaccines imply a psychological process: they must be accepted. According to Taylor, psychological reactions to the pandemic are complex; some people are resilient, others become highly distressed. It is possible to represent the reactions as a continuum from indifference to high anxiety and PTSD.

0 ← **100**

Some disregard the risks ↑ Some react with anxiety

Middle level
distress can be a consequence.

At point zero, you find people disregarding the risks of the disease, who fail to follow recommendations. It can happen for different reasons: Absence of information, failing confidence in the health authorities, they don´t believe it can happen or it is a simple sign of individualism and revelry. These people can become "superspreaders", able to disseminate the disease broadly. At point 100, you find individuals reacting with intense anxiety to the situation, going in some cases to anxiety disorders like PTSD. These people can become patients during and after the pandemic. In the middle of the continuum, you find most of the people, able to cope properly with threats, acting carefully and respecting the most difficult recommendations. Most of them will muddle through the pandemic without consequences, but some will experience a more or less severe distress. This is probably because stress seems to be an important mediation factor. It is a known fact that vulnerability to emotional distress depends on individual factors; people react differently to stressors in general, it seems to be true also for a pandemic. No single theory seems to be able to explain completely the different reactions to pandemics. Nevertheless, some research areas are relevant and complementary:(1) Research on particular personality traits as vulnerability factors for experiencing distress; (2) cognitive-behavioral models of health anxiety; (3) the concept of the behavioral immune system (focused on motivational responses to perceived risk of infection); (4) analyses of social psychological factors in the spreading of fear, distress, and disease; (5) research on vaccination attitudes; and (6) studies on risk communication.

The conclusions of Taylor – a series of recommendations to deal with the next pandemic – are a prefiguration of what would happen a few months later throughout the world: At a social level: Civil unrest and rioting (but also prosocial behavior), a rise of xenophobia and discrimination, a proliferation of conspiracy theories, the news media will sensationalize the pandemic, fake news will appear in Internet, Schools and other places of congregation will be closed, sanitation services may collapse due to worker absenteeism, people will be advised to remain at home. At an individual level: Many people will conform to health authorities, get vaccinated, cover their coughs, and keep social distancing; but many others will not, showing self-defeating behaviors, refusing to get vaccinated and to stay home; connection through internet will become essential; many people will be resilient to the stressors, but other will become anxious; people who score high on vulnerability traits (such as negative emotionality, intolerance of uncertainty) will be distressed; many people will cope well with isolation, other will experience intense loneliness and boredom.

Psychological effects of COVID-19

What we know until now about the effects of Covid-19 seems to confirm the predictions of Taylor. The first studies, made in China show an increase of PTSD, anxiety, depression, sexual problems, as well as lower well-being (Zhou et al., 2020; Li, Li, Xin, Wang and Yang; 2020; Yang and Ma, 2020; Yang, Li, Zhang, Zhang, Cheung and Xiang, 2020). In other countries, several correlates of the pandemic were reported, like increased domestic violence (Usher, Bhullar, Durkin, Gyamfi & Jackson, 2020), drug abuse (Volkow, 2020), reduction of physical activity (Tison et al., 2020), isolation and worsening of social relations and worsening of eating habits (Rodriguez-Besteiro, Tornero-Aguilera, Fernández-Lucas, Clemente-Suárez, 2021); it was also found that the constant flow of (real or fake) bad news in the media enhances negative effects on mental health (Armitage and Nellum, 2020). Similar reports are found in very different countries. In India, Patel, Patel & Patel (2020) found as effects of lockdown, angriness, beliefs that the own work efficiency was reduced or concerns about family income and different types of negative thoughts. In Algeria, Madani, Boutebal & Bryant (2020) inform about anxiety, stress, bad mood, rumination about epidemic, difficulty to follow the confinement instructions and changes in the habits of going to bed, waking up, using Internet and reading. McGinty, Presskreischer, Han & Barry (2020) observed in the USA an increase of people seeking help for mental health, suicide, drug overdoses, intimate partner violence, and child abuse compared to 2019. In Nigeria, Busayo (2021) found an increase of PSTD and anxiety, affecting significantly the well-being.

Last but not least, in Greece, it was observed as effects of quarantine that people older than 40 exhibited higher levels of resilience, married participants displayed higher levels of adaptation and a positive correlation was found between resilience, hope, and adaptability (Dimitriou, Drakontaides, & Hadjicharalambous, 2020). These observations coincide with a study made in Portugal, comparing German and Portuguese populations, which concluded that young adults rated their quality of life, optimism and well-being during pandemics lower than middle-age and old adults, and experienced higher levels of trait anxiety and difficulty to relax. It seems that young people show a lower psychological adjustment than other age groups during COVID-19 crisis (Candeias, Galindo, Stueck, Portelada & Knietzsch.

Other finding point out that Children and Young adults seem to be particularly at risk of developing anxious symptoms (Orgilés et al., 2020). In China, Young adults showed higher anxiety levels (Cao et al., 2020) and college students were found more likely to experience stress, anxiety, and depression (Li et al., 2020). In Italy and Spain, children (range 3–18) showed concentration difficulties, boredom, irritability, restlessness, nervousness, sense of loneliness, uneasiness, and worries. (Saladino, Algeri & Auriemma, 2020). In Zambia, university student showed anxiety, depression, worry, fear and stress associated with COVID-19 (Mudenda, 2021).

Another especially affected group seems to be health professionals.During the first phase of pandemic in Italy, researchers found higher prevalences of burnout and psychopathological conditions like clinical levels of depression, anxiety, stress, post-traumatic stress., emotional exhaustion, depersonalization, reduced personal accomplishment. Giusti et al. (2020) and Felice, Tanna, Zanus & Grossi (2020).

Therefore, the first conclusion of this paper is that we will have to give special attention to young people and health professionals in the future. Other conclusions are totally in line with the recommendations of (Taylor, 2019): In the future, it will be necessary to take measures for (1) Improving risk communication, (2) Improving adherence (e.g., vaccination), and (3) Addressing mental health issues such as the emergence or worsening of emotional problems.

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Non-Pharmacological Interventions for Chronic Pain: Systemic Basis

Natalya Polyvyannaya

REVIEWED
Marcus Stueck
Sebastian Müller-Haug
Int. Biocentric Research Academy/IBRA

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Martina Goth

AFFILIATION
Al Farabi Kazakh National University
Orcid: 0000-0003-3806-8767

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CORRESPONDENCE
Natalya Polyvyannaya,
Al Farabi Kazakh National University,
Almaty, Kazakhstan
email: natpolymat@gmail.com

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www.schibri.de

ABSTRACT

This theoretical article explores the application of a systemic basis to addressing chronic pain within the framework of the extended biopsychosocial model. Chronic pain poses a significant global challenge, affecting individuals' quality of life. Traditional approaches such as pharmacological interventions and physical treatments, have limitations in offering comprehensive solutions for individuals living with chronic pain. Similarly, relying solely on isolated psychological practices may not provide a definitive answer to effectively manage chronic pain. Drawing upon the principles of the biocentric science of health, this paper investigates the complex interplay among biopsychosocial, and individual factors in the experience and management of chronic pain. By considering the dynamic interactions among these domains, a holistic approach is proposed, highlighting the integration of optimal practices in non-pharmacological interventions. The theoretical foundation and potential benefits of adopting a systemic basis in chronic pain management are discussed, contributing to the advancement of biocentric science of health.

KEYWORDS

health psychology, pain psychology, psychological interventions, extended biopsychosocial model

Introduction

Chronic pain is a pervasive global health issue that significantly affects the quality of life for individuals worldwide. It is estimated that over 20 % of adults experience chronic pain, with varying degrees of severity and duration (Breivik et al., 2006; Goldberg & McGee, 2011). While pharmacological interventions and physical treatments have traditionally been used for managing chronic pain, they have inherent limitations in providing comprehensive solutions (Chou et al., 2017; Krebs et al., 2018). Although physical interventions can offer temporary relief and improve physical functioning, they may fail to address the underlying complexities associated with chronic pain (Gatchel et al., 2007). Additionally, pharmacological solutions come with side effects, contraindications, and the risk of drug tolerance and hyperalgesia (Mercadante et al., 2019; Varrassi et al., 2010). In the realm of psychological therapy, various approaches have been explored since the 1960s to manage chronic pain. However, there is no universally effective therapeutic approach for chronic pain (Morley & Williams, 2015). A comprehensive analysis of psychological therapies, including Cognitive Behavioral Therapy (CBT), revealed small or very small benefits in reducing chronic pain (Williams et al., 2020). Similarly, Behavioral Therapy (BT) and Acceptance and Commitment Therapy (ACT) did not demonstrate superior efficacy compared to waiting list control conditions (Williams et al., 2020).

Understanding the etiology of chronic pain can be complex, with some cases involving readily identifiable causes such as trauma-related chronic low back pain, while others present more elusive origins like persistent headache or atypical facial pain (Watson, 2022). It is crucial to recognize that physiological mechanisms are often involved in the maintenance of chronic pain, as observed in cancer pain. However, it is equally impor-

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tant to acknowledge that individuals with mental health disorders may also experience pain symptoms or alterations in pain perception. Additionally, individuals who find themselves in situations where they must continually validate their illness to access medical care, insurance coverage, or improved working conditions may inadvertently amplify their perception of pain (Watson, 2022). It is essential to differentiate this response from deliberate feigning of illness, which involves intentionally exaggerating symptoms for secondary gains.

Biopsychosocial approach recognizes that chronic pain encompasses physical, psychological, and social dimensions that profoundly impact individuals' well-being (Gatchel et al., 2007). Rather than focusing solely on symptom reduction or isolated psychological interventions, this systemic perspective recognizes the interconnectedness of various factors contributing to chronic pain and aims to address them in a comprehensive manner. Moreover, a systemic basis that encompasses not only biological, psychological, social, but also individual aspects of pain may yield even more optimal outcomes in formulating and providing interventions. By considering the systemic nature of chronic pain, healthcare professionals can develop tailored treatment plans that encompass a range of non-pharmacological interventions.

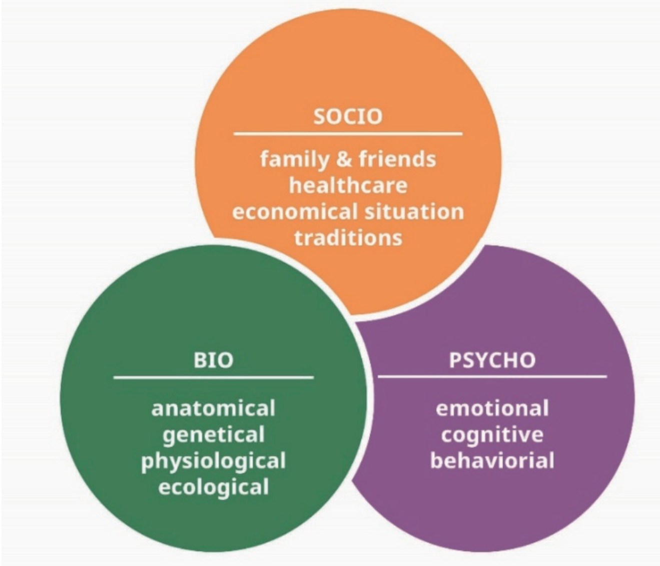
Continuous improvement of the approach to managing chronic pain is imperative in order to optimize patient outcomes and enhance the effectiveness of interventions. The biopsychosocial approach recognizes that chronic pain encompasses physical, psychological, and social dimensions that significantly impact individuals' well-being (Gatchel et al., 2007). Rather than focusing solely on symptom reduction or isolated psychological interventions, this systemic perspective acknowledges the interconnectedness of various factors contributing to chronic pain and aims to address them comprehensively. Moreover, a systemic basis that considers not only biological, psychological, and social aspects but also individual factors of pain may yield even more optimal outcomes in formulating and providing interventions. By recognizing the systemic nature of chronic pain, healthcare professionals can develop tailored treatment plans that encompass a range of non-pharmacological interventions, taking into account the multifaceted nature of the condition.

Importance of Biopsychosocial Model

The experience of chronic pain is influenced by the interplay between biological, psychological and social factors, as described by the biopsychosocial model (Gatchel et al., 2007). The biomedical model of illness considers psychological reactions and their impact on the social situation as secondary to the disease. In contrast, the biopsychosocial paradigm provides a broader understanding of chronic pain, emphasizing the need to address it from multiple perspectives.

In accordance with Danilov A.B.'s biopsychosocial model, Figure 1 illustrates the various factors that influence the perception of chronic pain (Danilov & Danilov, 2013). This model emphasizes the intricate interaction among biological, psychological, and social elements in shaping the pain experience. Gaining a comprehensive understanding of these factors is crucial for the development of effective interventions that address the complex nature of chronic pain in individuals.

Figure 1 Biopsychosocial factors of chronic pain



Individuals with chronic pain often exhibit cognitive processes characterized by heightened attention to pain, negative attitudes, and catastrophizing thoughts (Goubert et al., 2005). Emotionally, chronic pain is closely linked to the presence of anxiety and depression, which arise as a consequence of the enduring pain experience (Asmundson et al., 1999; Tang et al., 2008).

Physically, chronic pain is marked by changes in pain thresholds, sympathetic activation, and increased muscle tone (Nijs et al., n.d.; Woolf, 2011). Sympathetic activation, characterized by increased arousal responses, and heightened muscle tone create a cycle of physiological tension and difficulty in achieving relaxation (Fillingim et al., 2014).

Cognitive processes play a significant role in the experience of chronic pain. Attentional biases towards pain-related stimuli and the tendency to focus on pain sensations contribute to the amplification of pain experiences (Linton et al., 2018; Vlaeyen & Linton, 2012). Negative attitudes and beliefs about pain, such as the belief that pain is uncontrollable or that it will worsen over time, can intensify pain perception (Bunzli et al., 2017; Goubert et al., 2005).

While the biopsychosocial model provides a valuable framework for understanding and addressing chronic pain, it is essential to recognize that it may not be sufficient on its own. The complexity of chronic pain requires a more nuanced and individualized approach that, possibly, goes beyond the traditional biopsychosocial model. Each individual experience chronic pain in a unique way, and their treatment needs to consider their specific biological, psychological, social, and personal story of trauma. Adopting a more holistic and personalized perspective that embraces the individuality of each patient is necessary to optimize interventions and improve outcomes in chronic pain management.

The Biopsychosocial Model: An Extended Perspective

The extended biopsychosocial model provides a comprehensive framework for understanding chronic pain by considering biological, psychological, social, and individual factors. It recognizes that pain is not solely a result of physical processes but is also influenced by psychological and social factors. Within this model, the biological dimension encompasses the physiological mechanisms underlying pain, such as nociception and neuroplasticity. The psychological dimension involves cognitive and emotional processes, including attention, beliefs, and coping strategies. The social dimension recognizes the impact of sociocultural factors, interpersonal relationships, and social support on pain perception and management. Importantly, the extended model expands upon the traditional biopsychosocial model by incorporating individuality as a distinct component.
Figure 2 depicts Ganzene‘s Structural Model of the Psyche (Ganzen, 1984), which follows the subjective approach to studying human beings. This model illustrates the integration of the individual, personality, subject, and individuality within a systemic context. It distinguishes between the concepts of “individual” and “individuality”, where the former refers to being part of a collective group, and the latter denotes the unique life experience of an individual.

Figure 2 Systemic Model of the Psyche according to V.A. Gansen (Ganzen, 1984)

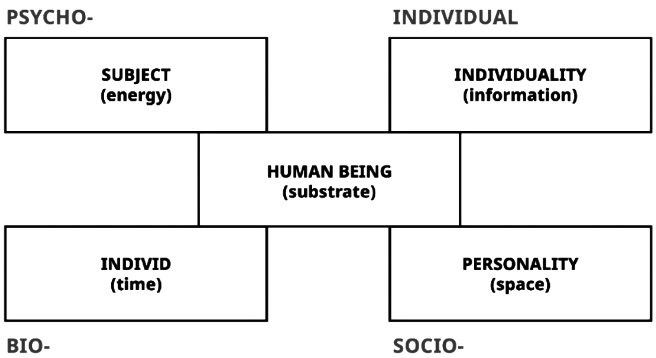
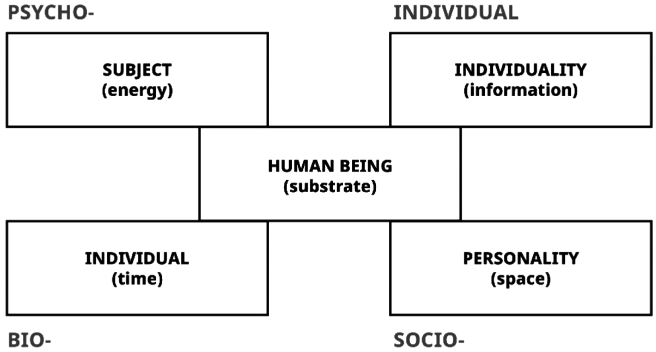


Figure 3 Extended Biopsychosocial Model for interventions



The structural model of the psyche encompasses the biological aspect of a person (individual), their social relationships (personality), their role as an active agent (subject), and their individual history (individuality). This model aligns closely with the extended biopsychosocial approach and enhances our understanding of the complex nature of chronic pain by incorporating the concept of individuality.
The extended biopsychosocial model, incorporating Ganzene’s structural model, provides a systemic framework for interventions in chronic pain therapy, as implemented in Figure 3. According to this model, individuals with chronic pain can benefit from systemic and multifaceted approach to pain management. From an individual perspective, strategies such as bodyworks, movement therapy, adequate rest, therapeutic exercise, physiotherapy, and massage can be effective. From a personality perspective, social support and the establishment of support systems among peers, close acquaintances, medical professionals, and psychologists play a crucial role. From a subjective standpoint, psychological interventions targeting cognitive and emotional components, mindfulness, self-compassion as well as other non-pharmacological therapies, are essential.
The systemic model presented here addresses a previously overlooked factor in chronic pain management, namely, individuality. Recognizing that each individual’s experience of chronic pain is unique, the model emphasizes the importance of exploring the personal history of pain and trauma. By acknowledging and honoring individuality, the systemic model empowers patients to actively participate in their healing process and regain control over their lives and pain. This holistic approach recognizes the multidimensional nature of chronic pain and promotes patient-centered care, enhancing the overall effectiveness of interventions.

Conclusion

Adopting a systemic perspective in chronic pain management offers a valuable approach to address the complexities of this widespread issue. Integrating the extended biopsychosocial model provides a comprehensive framework for understanding chronic pain and developing effective interventions. By considering the dynamic interactions among biological, psychological, social, and individual factors, this approach promotes a holistic understanding of chronic pain and emphasizes the integration of evidence-based practices in diverse non-pharmacological interventions. Incorporating individuality as a key component further enhances the model‘s applicability, allowing for personalized and empowering approaches to chronic pain management. Embracing a systemic perspective in both research and clinical settings contributes to the advancement of biocentric science of health and facilitates meaningful change in the lives of individuals living with chronic pain.
Extended biopsychosocial model, along with the incorporation of individuality, provides a foundation for developing personalized and holistic interventions that address the multidimensional aspects of chronic pain. By embracing this approach, healthcare professionals can improve outcomes and enhance the overall well-being of individuals living with chronic pain.
Further theoretical and experimental research is needed.

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Effects of a psychomotor intervention on psychomotor profile in institutionalized elderly with mild dependency

Ana Morais[a], Filipa Pereira[b], Gabriela Almeida[c]

REVIEWED
Marcus Stueck
Sebastian Müller-Haug
Int. Biocentric Research Academy/IBRA

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EDITED
Martina Goth

AFFILIATION
a Departamento de Desporto e Saúde, Escola de Saúde e Desenvolvimento Humano, Universidade de Évora; Comprehensive Health Research Centre (CHRC), Universidade de Évora, Portugal
Orcid: 0000-0002-3036-2526
b Departamento de Desporto e Saúde, Escola de Saúde e Desenvolvimento Humano, Universidade de Évora
Orcid: 0009-0004-6620-883X
c Departamento de Desporto e Saúde, Escola de Saúde e Desenvolvimento Humano, Universidade de Évora; Comprehensive Health Research Centre (CHRC), Universidade de Évora, Portugal
Orcid: 0000-0002-6716-2114

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CORRESPONDENCE
Ana Morais,
Colégio Luís António Verney –
Rua Romão Ramalho n° 59, –
7000-671 Évora, Portugal,
Mobile: 00351967088138,
email: ana.morais@uevora.pt

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www.bionet-research.com
www.schibri.de

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ABSTRACT

Institutionalized elders tend to have a higher dependency on the performance of basic and instrumental activities of daily living, as well as a higher percentage of cognitive deficit and poorer psychomotor performance. This short paper intends to analyze the impact of a psychomotor intervention in psychomotor profile and three specific components – motor prevalence, cognitive prevalence, and physical constraints, assessed by the Examen Géronto-Psychomoteur (EGP) adapted for Portuguese population. The sample consisted of nine elders (M = 77.44yrs; SD = 8.99) institutionalized in a nursing home residence, all with mild dependency and cognitive deficit. The intervention was conducted for 30 group sessions. Each session was structured in five moments: reality orientation activity, warm-up, core activity, cool-down and finishing ritual. Data analysis was performed with descriptive analysis and Wilcoxon statistical test. The results from data comparison in pre- and post-intervention showed significant improvements in the psychomotor profile and in the cognitive prevalence component. It was also checked the differences in each elder person for the studied variables. This study aimed to enhance the understanding of the importance of psychomotor intervention in geriatric care, particularly when integrated within a multidisciplinary rehabilitation team.

KEYWORDS
psychomotricity, aging, dependency, cognitive impairment, institutionalization

Introduction

The increase in average life expectancy is associated with an increment of deficits and pathologies derived from the aging process, which can negatively influence the lives of older people (Espadinha, Branquinho & Morais, 2021). In Portugal, recent data from 2021 revealed that the elderly is increasing and corresponds approximately to a 25 % of the population (Observador, 2021).

According to this reality, we have the responsibility to improve our knowledge and professional practices to face the new needs of this population and prepare the health professionals to act with a better understanding of the causes, processes, and consequences of aging and, in this case, psychomotor assessment and therapy.

First of all, it is essential to have the notion that aging is a heterogeneous and an individual process, because it depends on so many factors, such as genetics, educational and social factors, medical history, professional history, and many other factors (Lefèvre, 2023; Espadinha et al, 2021). In this sense, a case-study methodology could be beneficial for the understanding of individual differences in the impact of assessment and/or intervention in older adults.

On the other hand, in this study, we focused on psychomotor competences, that involve the interaction between the mind and human movement and are significantly influenced by the higher brain center's function, for example, the motor cortex (Morais, Santos & Lebre, 2017). Therefore, these competences are directly influenced by physical and mental aging. In general, studies have shown that balance and motor coordination can be affected by a reduction in muscular strength, augmentation of reaction time and presence of difficulties in performing double task demands (Lefèvre, 2023). Nevertheless, in a healthy aging and at a cognitive level, older people usually maintain their cognitive abilities till late years (Lefèvre, 2023; Morais et al, 2017). The embodied self can also be affected, not only by aging, but also by changes in the social and family context and institutionalization (Personne, 2020). There are often stigmas and prejudices related to physical identity, giving a negative connotation, for example, to wrinkles, gray hair and also related to social identity, associating the elderly with uselessness and fragility.

Finally, it is fundamental to understand the effects of different conditions and pathologies, as well as the event of institutionalization, in psychomotor profile and performance in older adults. Studies have shown that quality of life has worst levels in institutionalized persons, often related with less opportunities do decide for themselves, less physical activity, and poorer cognitive stimulation (Medeiros et al, 2020). Dementia is probably the most frequent health issue present in institutions for older people. In a study made in Portugal, older people with dementia presented significant lower results, compared with older people without dementia, in static and dynamic balance, fine motricity (upper and lower limbs), praxis, knowledge of body parts, vigilance, perceptive memory, space and time domain, verbal memory and communication (Morais et al, 2017).

Thus arises the need to implement specific intervention programs, both in the preventive and therapeutic aspects, and to understand the effectiveness of these programs, namely the psychomotor intervention with elderly.

Design of the study

The current study adopts a quasi-experimental design and includes elderly people residing in a nursing home located in the central region of Portugal. All measures were performed at baseline and after 30 sessions of intervention.

Participants

Participants included 9 older adults (M = 77.44yrs; SD = 8.99) institutionalized in a nursing home residence with mild dependency. In what concerns the cognitive status, according to the MMSE scores for Portuguese population and level of education of the participants (Sequeira, 2018), we have four participants with cognitive deficit (MCP, MGP, MMS, MCR) and five participants without cognitive deficit (MAC, BG, MLF, LB, MMF). About the autonomy in basic activities of daily living, according to the Barthel Index, all the participants had a slight dependence in this parameter.

The following inclusion criteria were used: 65 years of age and older; living in a nursing home; com dependênciawith mild dependency; with physical condition to participate in the sessions (mas semestar acamado?capaz de ir às sessões?)

Methods

The present study was approved by the Ethics Committee of the University of Évora. Informed consent was signed by all participants or by their legal guardian (in case of incapacity), after explaining the study. Once the institution had consented to participate in the study, participants who met the inclusion criteria were recruited.

Data collection was carried out in December 2021 (baseline assessment) and June 2022 (post-intervention assessment). Three instruments were used for the evaluation:

(1) Barthel Index: assessment of the subject's level of autonomy in carrying out for 10 different basic activities of daily living (Sequeira, 2018); the Barthel Index was filled by the social assistant from the institution. Each item is scored based on whether or not the individual can perform a task or activity independently, with assistance or if they are fully dependent. The scoring is as follows: 0 – unable, 1 – needs assistance/help, 2 – independent. The score changed between 0 and 100. The higher the score, the more independent the patient is. The scored change between total dependency and slight dependency.

(2) Mini Mental State Examination (MMSE): assessment of specific cognitive abilities in the elderly, taking into accountconsidering their level of education (Sequeira, 2018). The maximum score is 30 points and the higher the score the more MMSE performance.

(3) Portuguese Version of Examen Géronto-psychomoteur (EGP): consists of a qualitative and quantitative assessment instrument of psychomotor skills in the elderly. This includes 17 domains, including: static and dynamic balance; joint mobilization of the upper and lower limbs; fine motor skills of the upper and lower limbs; praxis; knowledge of body parts; vigilance; perceptive memory; spatial domain; verbal memory; perception; temporal domain and communication (Morais, Santos & Lebre, 2021). Through exploratory and confirmatory factor analysis, this instrument is divided into 3 components: motor prevalence (includes static and dynamic balance domains and fine motor lower limbs domain), cognitive prevalence (includes fine motor upper limbs, praxis, knowledge of body parts, vigilance, perceptive memory, space domain, verbal memory, perception, time domain and communication) and physical constraints (joint mobilizations of upper and lower limbs). With the EGP assessment we studied four variables: psychomotor profile (total score) and the three specific components.

The assessment was administered on an individual setting, ensuring a tranquil and secured environment. The assessment initiated with the administration of the MMSE by a qualified psychologist, which was followed by the EGP administered by a skilled psychomotor therapist. The entire assessment process lasted 90 minutes, including a scheduled break during the administration of the EGP test, as prescribed by the procedure.

Data Analysis

Data analysis was performed with descriptive analysis (mean, standard deviation (SD) and Wilcoxon statistical test. SPSS Statistics version 24 (IBM) software was used to analyze the data. The level of significance was 5% ($p < 0.05$).

Table 1 Psychomotor profile from participants (mean and SD)
M – mean; SD – standard deviation; EGP – Portuguese Version of Examen Géronto-psychomoteur

	EGP							
	psychomotor profile		**motor prevalence**		**cognitive prevalence**		**physical constraints**	
Participant/ all sample	Baseline	Post-intervention	Baseline	Post-intervention	Baseline	Post-intervention	Baseline	Post-intervention
MCP	70	80	19	20,5	40	47,5	11	12
MGP	59,5	61,5	21,5	23	27	24,5	11	12
MMS	66,5	84	26	29	32,5	43	8	12
MCR	78,5	80,5	23	20,5	44,5	48	11	12
MAC	90,5	97,5	27	27	52,5	58,5	11	12
BG	82,5	88,5	24	27	47,5	49,5	11	12
MLF	82	90,5	25	18	49,5	55,5	7,5	12
LB	90	96,5	26	29	54	56,5	10	12
MMF	79	79,5	26	21,5	43	50,5	10	8
Total sample (mean; SD)	**77,61 (10.46)**	**84.28 (10.93)**	**24,17 (2.45)**	**23,94 (3.88)**	**43,39 (8.49)**	**48,17 (9.57)**	**10,1 (1.30)**	**11,56 (1.25)**

Psychomotor Intervention

The intervention consisted in 30 group sessions (2-days/week; 45–60min). The participants were divided in 2 groups: one with 3 elements and one with 6 elements, according to their cognitive and functional state.
Each session was structured in five moments:

1. Reality orientation activity: consists of tasks involving references to information about time ("which day is it? month? year?), place/space (where are we?) and aspects of the person ("how are you feeling today? Do you have other activities?). It doesn't intend to be a questionnaire, but more like a group conversation.
2. Warm-up: involves movement to promote a muscular preparation, awareness of the breath and the body and all possibilities of body movement, introducing a psychomotor activity.
3. Core activity: the therapist proposes activities in accordance with the established goals for the session (ex. planning and execution of a certain action, dual task, balance exercises). All proposed activities presuppose the exploration of different strategies and the empowerment of the participants.
4. Cool-down: it is a moment to return to calm and to decrease high levels of motor and cognitive activity. In general, these activities are an adaptation of relaxation techniques.
5. Finishing ritual: consist in a final moment to share experiences and expectations for the next session.

Results

Table 1 display the statics descriptive (mean and SD) for each participant and for all sample, for the following variables: psychomotor profile (EGP total), motor prevalence, cognitive prevalence, and physical constraints. The results from data comparison in baseline and post-intervention for the sample showed significant improvements in the psychomotor profile ($M=84.28$, $SD=10.93$ vs ($M=77.61$, $SD=10.46$, $p<.008$) and in the cognitive prevalence component ($M=43.39$, $SD=8{,}50$ vs $M=48.17$, $SD=9.57$, $p<.018$). Differences in each participant for the four variables, it was also checked (see figures 1, 2 and 3) (psychomotor profile, motor prevalence, cognitive prevalence, and physical constraints).

Psychomotor Profile

As it is possible to observe in figure 1, all the participants increased their results for the total EGP, except the subject MMF that maintained the same value.

Motor Prevalence

Participants MCR, MLF and MMF had lower final results for EGP's motor component (see figure 2). It should be referred that participants MCR and MLF reported a fall near the final of the intervention, that affected their mobility during this period of time.

Cognitive Prevalence

As it is possible to perceive in figure 3, all participants had better final results for this component, except subject MGP. This participant had a dementia diagnosis, and it was reported by the multidisciplinary team that it was observed a significative deterioration of the cognitive state when her husband got ill (this event happened during the psychomotor intervention). Participants with cognitive deficit (MCP, MGP, MMS, MCR) have lower scores in this component than the other participants.

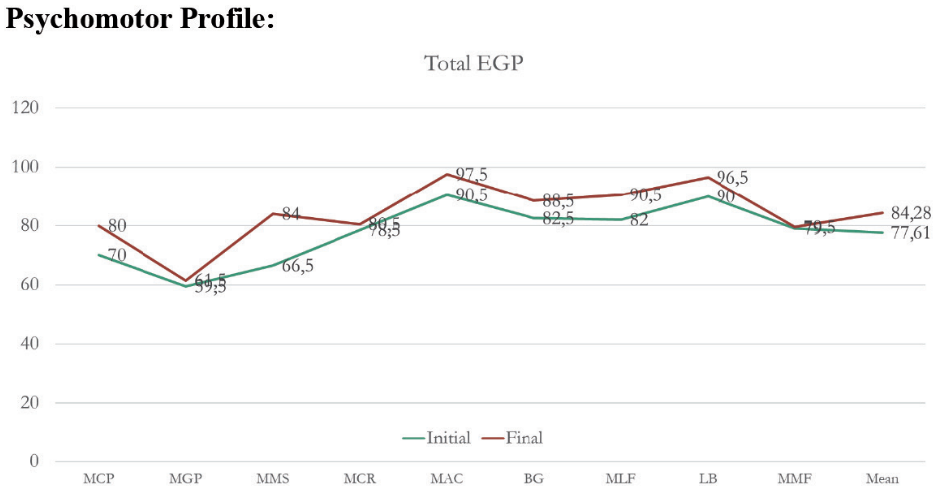


Figure 1 Results of initial and final assessment of the EGP's total punctuation, for each participant.

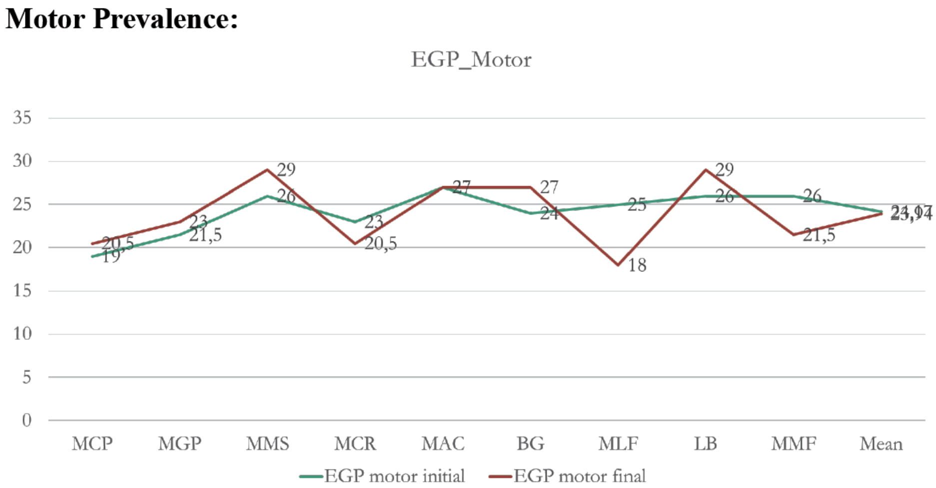


Figure 2 Results of initial and final assessment of the EGP's motor component, for each participant.

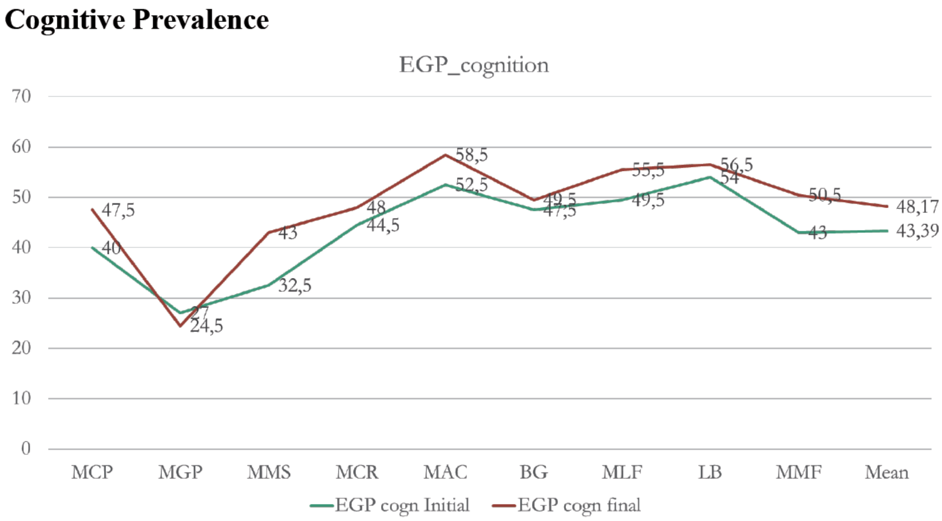
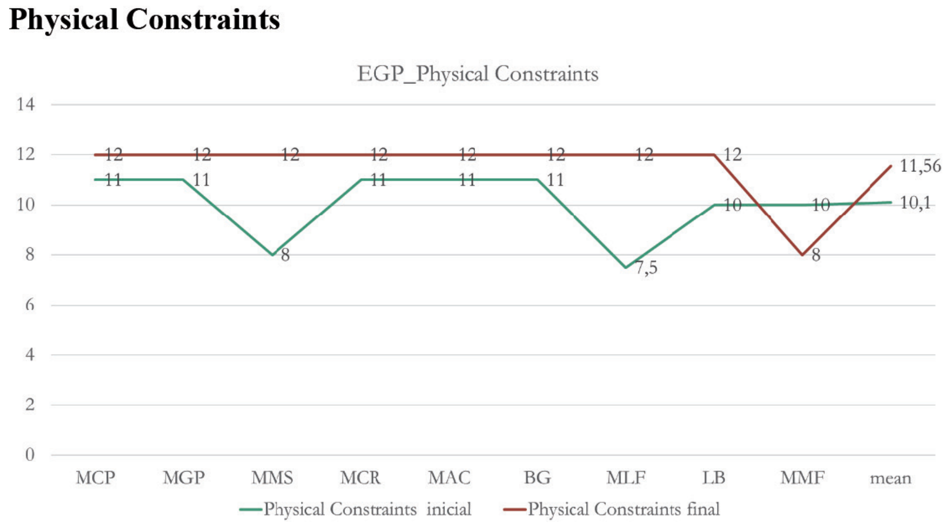


Figure 3 Results of initial and final assessment of the EGP's cognitive component, for each participant.

Figure 4 Results of initial and final assessment of the EGP's physical constraints component, for each participant.



Physical Constraints

All participants increased their final scores, except MMF. This subject had a breast cancer diagnosis and had a worsening of this pathology during the psychomotor intervention, with presence of pain in different parts of the body (reported by the patient).

Discussion and conclusions

Psychomotor therapy promotes a reconstruction of the schema and body image, a strengthening of maintained capacities, giving a positive meaning to the body experience (Marceau-Barquin, 2022). With regard to the elderly, this type of intervention is relevant and, in specific cases, even urgent.

In this study, participants with cognitive deficit have lower scores in the EGP's cognitive prevalence component, as expected. The subject with dementia diagnosis (MGP) had the lowest score in psychomotor profile, in the initial and final assessment. This is in accordance with the study of Morais et al. (2017) that found that Portuguese older people with dementia had significant lower EGP's total score compared with people without dementia. Nevertheless, even with a dementia diagnosis, this participant increased the EGP's total score, the motor prevalence score, and the physical constraints score, after the psychomotor intervention. Recent research has been showing the benefits of movement-based therapies in people with dementia, in different areas, such as reduction of strain in joints (Niks & van't Hooft, 2017) in a physical perspective, better psychosocial functioning, improved functional abilities and neuroendocrine functioning (Ho et al, 2020) in a functional level, and a positive impact on anxiety and agitation (Bennett, 2021) in a behavior level. In the intervention implemented in this study, the activities proposed had a strong component of physical and motor demands, because it was based in group dynamics and active tasks. It seems logical that these were the areas that had a positive evolution for this participant. For the same reason it is understandable that the subjects that had their mobility affected during the intervention had worse scores in the final assessment of motor prevalence component.

In this study it is evident the heterogeneity of the results. In our perspective this constitutes a highlight for the importance of taking in account the individual experiences and events in assessment and intervention. Events like falls and the presence of comorbidities could have an important impact on the psychomotor competences assessed and/or in the therapeutic process. In other perspective, including personal details in an individualized intervention seems to be beneficial to stimulate cognitive functions, such as autobiographical memory (Kirk et al, 2019) and in global quality of life (Chenoweth et al, 2019). Even if it is a technology-based intervention, it seems that individualization of this process has positive impacts on a sense of self or in being actively involved in the dynamic proposed (Goodall, Taraldsen & Serrano, 2021). Psychomotor intervention, even if it is developed in a group context, constitutes an individualized therapy, with the reinforcement of the identity of the person as a goal, regardless of the age or condition. It is essential to have a qualitative and individual analysis of the research about the impact of the intervention, in order to respect the principles of psychomotricity. Nevertheless, in a group results analysis, for the participants of this study, psychomotor intervention seems to have had positive effects on psychomotor competences in general and in cognitive-based competences. These results are in accordance with the impact of other movement-based interventions (Brancatisano, Baird & Thompson, 2019; Blanco-Rambo, Izquierdo & Cadore, 2023). This study intends to advance with contents about the importance of the psychomotor intervention in geriatric care, specifically integrated in a multidisciplinary rehabilitation team. In Portugal, nursing homes traditionally have their care oriented for the basic daily living activities. It is important to develop knowledge about the impact of non-pharmacological interventions in older adults with and without dementia, in order to institutions have the necessary information to recruit the health professionals and choose the type of therapies more effective for the population attended in their services.

This study has several limitations. The sample was small and was from a single residential care facility, so it is not representative of all individuals with the same context living. Also, the sample corresponds to a heterogeneous group, with people with and without cognitive deficit/dementia. Although it represents the "usual" type of population in nursing homes in Portugal, in the future could be useful to understand the impact of the program in different populations separately, in order to have more adequate interventions for the characteristics and needs of the older population. Moreover, it was not studied the impact of duration or the dosage of the program. In the future, these factors should be included to maximize the benefits of the intervention.

In the future, research about psychomotor intervention with older people (with and without pathologies) will be carry on with a broader sample and will be studied the impact in different areas – physical and motor competences, cognitive functions, functional capacity, social and emotional factors, and physiological parameters.

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Ageing Healthy and Integrative Lifespan

Catarina Pereira[a], Jorge Bravo[b], Adelinda Araújo Candeias[c], Gabriela Almeida[d]

REVIEWED
Marcus Stueck
Sebastian Müller-Haug
Int. Biocentric Research Academy/IBRA

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EDITED
Martina Goth

AFFILIATION
a Departamento de Desporto e Saúde, Escola de Saúde e Desenvolvimento Humano, Universidade de Évora, Évora, Portugal.
Comprehensive Health Research Centre (CHRC), Universidade de Évora, Évora, Portugal
Orcid: 0000-0001-8111-1455
b Departamento de Desporto e Saúde, Escola de Saúde e Desenvolvimento Humano, Universidade de Évora, Évora, Portugal. Comprehensive Health Research Centre (CHRC), Universidade de Évora, Évora, Portugal
Orcid: 0000-0002-9009-5693
c Departamento de Ciências Médicas e da Saúde, Escola de Saúde e Desenvolvimento Humano, Universidade de Évora, Évora, Portugal. Comprehensive Health Research Centre (CHRC), Universidade de Évora, Évora, Portugal
Orcid: 0000-0002-9489-8880
d Departamento de Desporto e Saúde, Escola de Saúde e Desenvolvimento Humano, Universidade de Évora, Évora, Portugal.
Comprehensive Health Research Centre (CHRC), Universidade de Évora, Évora, Portugal
Orcid: 0000-0002-6716-2114

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CORRESPONDENCE
Catarina Pereira
Departamento de Desporto e Saúde, Escola de Saúde e Desenvolvimento Humano, Universidade de Évora
Largo dos Colegiais 2
7004-516 Évora, Portugal
email address: clnp@uevora.pt

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www.bionet-research.com
www.schibri.de

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ABSTRACT

The recent increase in life expectancy presents both constraints and opportunities. While aging is commonly associated with losses and deficits, the prolonged lifespan allows individuals to engage in new roles within the community and family and pursue novel activities. For individuals to take advantage of this opportunity is crucial to maintaining health through ageing, as it directly contributes to an extended lifespan. Promoting and adhering to comprehensive actions are key factors in achieving healthy aging. These actions encompass preventive and rehabilitative measures and interventions involving all stakeholders, either older adults, researchers, health and exercise professionals, or civil and governmental entities. The integrated model of action proposed in this article underlay an algorithm and has demonstrated its effectiveness in promoting healthy aging and extending lifespan. Specifically, it has proven effective in preventing falls, reducing dependency among older adults, and delaying their institutionalization in nursing homes.

KEYWORDS
Elderly, health, intervention, risk analysis, algorithm

Life Expectancy and Population Aging: Opportunity versus Challenge

A worldwide demographic shift has recently been observed, with a significant increase in the elderly population (WHO, 2020b). This demographic change is primarily due to the rise in life expectancy, although declining fertility and decreasing birth rates also play a significant role in this phenomenon (Vollset et al., 2020; WHO, 2020c). Considering this scenario, the remarkable achievement of humanity in increasing life expectancy has been primarily accomplished through advancements in pharmacology, medicine, and public health (Buxbaum et al., 2020). However, this achievement has also brought forth some less favorable aspects, primarily because the additional years of life gained often come with health challenges (Amuthavalli Thiyagarajan et al., 2022).

Aging is associated with changes over time, leading to a decline in the efficiency of systems necessary for maintaining homeostasis (Chatterjee et al., 2017). This results in a higher susceptibility to diseases, as well as structural and functional impairments that lead to frailty, reduced resilience, and diminished ability to cope with stress and adaptive demands (Amorim et al., 2022; Fuggle et al., 2022; Ogrodnik et al., 2019). Thus, related to the aging process is observed a gradual decline in the physical and mental capacity associated with sensory and motor deficits, and the emergence of diseases, until ultimately culminating in death (Amorim et al., 2022; WHO, 2022a). Nonetheless, aging is a process occurring differently in each individual since it depends on several biological-evolutionary, psychological, and socio-contextual factors such as gender, culture, or socioeconomic status (Candeias & Galindo, 2022; Kornadt et al., 2020). In addition, the person's life path is of crucial importance in the aging process (Mavritsakis et al., 2020), for example, it was observed that engaging in creative activities plays a role as a protective factor against cognitive decline in older adults (Candeias & Galindo, 2022). Despite the interindividual diversity, concomitantly with the ageing process, sooner or later, there is a decrease in functional ability, an increased susceptibility to accidents such as falls, the loss of independence, and even the loss of autonomy (Pereira, Bravo, et al., 2021; Sánchez-García et al., 2019; WHO, 2022b). That is, respectively, the loss in the ability to perform advanced, instrumental, and basic activities of daily living (independence), and the loss in the capacity to make one's own decisions, feel in control of one's future and believe in the ability to accomplish desired tasks (autonomy) (Fujiwara et al., 2008; Rikli & Jones, 2013; Sánchez-García et al., 2019). Given the aforementioned, older people, their families, society, and governments face an emerging issue as disability increases with age. The literature indicates that one in every three older adults (aged 60 or above) is a person with disability (WHO, 2022b).

It is worth noting that extending life expectancy, especially when accompanied by good health, brings forth numerous positive aspects. The additional years of life for older adults present opportunities not only for themselves but also for their families and society as a whole, such that older adults can assume new roles within their community and family, engaging in activities such as managing community associations, contributing to the education of grandchildren, or engaging in volunteering initiatives (WHO, 2022a). For this reason, the increase in life expectancy should be accompanied by an increase in the healthy lifespan length, and scientific advancements should support interventions that help delay age-related decline (Berthelot et al., 2019; Crimmins, 2015). Civil and political societies should integrate scientifically recommended measures to promote healthy aging (WHO, 2020a, 2021).

Healthy Aging

Healthy aging refers to „the process of developing and maintaining functional ability that enables well-being in old age" (WHO, 2020a). The concept of healthy aging is a complex construct that involves multiple dimensions. Recent studies suggest that, besides measuring an individual's intrinsic capacity, this concept should also consider social and political involvement and older adults' interaction within these contexts (Rivadeneira et al., 2021). Furthermore, research demonstrates that person-environment interactions throughout the life course, adaptations, environments, and the promotion/ empowerment of health are crucial for healthy aging (Menassa et al., 2023).

According to the World Health Organization (WHO) (WHO, 2021), creating opportunities that enable individuals to pursue what they value throughout their lives is essential for healthy aging. Additionally, optimizing the functional capacity of older adults is crucial to provide them with these opportunities (WHO, 2021). Functional capacity encompasses several aspects, including 1) meeting basic needs, 2) learning, growth, and decision-making abilities, 3) mobility, 4) building and maintaining relationships, and 5) contributing to society (WHO, 2020a). Moreover, functional capacity encompasses the individual's intrinsic capacity, living environment, and the people they interact with (WHO, 2020a). Intrinsic capacity refers to the physical and mental capabilities that a person can use, including locomotor capacity (physical movement), sensory capacity (such as vision and hearing), vitality (energy and balance), cognition, and psychological capacity (WHO, 2020a). Environments refer to the places where individuals reside and conduct their lives, and they play a role in shaping the opportunities and activities available to older adults with a certain level of intrinsic ability. Environments encompass the home, community, and society, including products, equipment, enabling technologies, natural or constructed surroundings, attitudes, and services (WHO, 2020a, 2021).

Proposal for an Action Model for Healthy Aging

Although there is consensus in the literature that healthy aging depends on the individual's characteristics, goals, adaptive capacity, and willingness to actively and participatively embrace change (Menassa et al., 2023; Zaidi et al., 2017), it is also evident that as individuals age, healthy aging increasingly relies on the involvement of compensatory support for the decline in intrinsic capacities and the respective contribution to optimizing individual's functional capacity (WHO, 2020a). Therefore, it is crucial to design interventions to promote healthy aging and assess their impact with older adults (WHO, 2021).

Notwithstanding other conceptions, the present work authors suggest the use of integrated action models to promote healthy aging. These models can be employed to overcome macro-level barriers to healthy aging, such as i) lack of information regarding the health and functional status of older adults; ii) insufficient research addressing current and future needs of older adults; iii) unfriendly urban and community environments; iv) lack of a comprehensive long-term healthcare system that integrates community and home-based prevention and/or rehabilitation interventions (Rudnicka et al., 2020; WHO, 2015, 2021). At a more micro level, barriers to healthy aging, such as falls, dependency in performing activities of daily living, and institutionalization, are also obstacles to be addressed and overcome using integrated action models (Pereira, Fernandes, et al., 2016; Pereira et al., 2022).

Concretely, this work authors propose an integrated action model that involves the following steps: 1) Problem identification, 2) Identification of causes/risk factors that contribute/ explain the problem, 3) Definition of measurement methods for the causes/risk factors (using validated instruments or creating new ones if necessary), 4) Prioritization of the causes /risk factors that contribute/explain the problem, 5) Design of specific measures, programs, and interventions that target the identified causes/risk factors, 6) Implementation of these measures, programs, and interventions in the field, and respective effectiveness analysis, 7) Design of recommendations and respective dissemination to the scientific, civil, and political communities.

As an example, this action model has been successfully applied, resulting in the publication of several studies conducted by Pereira and colleagues to address problems related to healthy aging and lifespan extension obstacles, such as falls, dependency, and institutionalization in nursing homes (an undesirable event for most older adults) (Pereira, Baptista, et al., 2016; Pereira, Bravo, Raimundo, et al., 2020; Pereira, Fernandes, et al., 2016). In these cases, cross-sectional and longitudinal studies were outlined to identify the key risk factors associated with these adverse events or conditions(Pereira, Baptista, et al., 2016; Pereira, Bravo, Raimundo, et al., 2020; Pereira, Bravo, Veiga, et al., 2020; Pereira, Fernandes, et al., 2016; Pereira, Veiga, et al., 2021). For this intent, a tools assessing the aforementioned factors were build and patented

(Pereira et al., 2019), the tool included: i) an assessment kit with physical evidence whose assessment materials are simultaneously a transport system, ii) a new evaluation instrument to assess affordance perception which was developed and validated such there was as gap on this field (Almeida et al., 2019a), iii) the toll is supported by a powerful technological system for the registration, storage (Almeida et al., 2019b) and automatic processing of data/measured results, a reported advantage in health care setting (Butterworth & Nicholson, 2004; Sodhro et al., 2020); and iv) the toll was designed taking into consideration the principles of Design for Sustainability, Eco Design, Circular Design, Cradle to Cradle strategies and the Life Cycle Assessment(layouts, materials and container) (Guide., (n.d.); Secca Ruivo & Carlan, 2018), and v) the toll include software which automatically compute a report with the individual falls risk profile based on an analytic algorithm, namely the *Dynamic performance-exposure algorithm for falling risk assessment and prevention of falls in community-dwelling older adults* (Pereira et al., 2022).

To effectively implement intervention measures in the field, rehabilitation, and prevention programs have been developed and tested (Rosado, Bravo, et al., 2022; Rosado et al., 2021; Rosado & Pereira, 2023; Rosado, Pereira, et al., 2022). These programs have demonstrated their positive impact on healthy aging, and, based on their proven benefices, we can specifically recommend the implementation of multimodal exercise programs, interactive cognitive-motor programs, and psychomotor rehabilitation interventions to prevent falls, to maintain independence, to delay nursing home admission, and to maintain autonomy.

In this action model, it is crucial to remember that the involvement of all these stakeholders in the process will be fundamental for promoting changes, with particular emphasis on the older person themselves (Menassa et al., 2023; Zaidi et al., 2017). This, with the purpose of promoting beliefs attitudes, and behaviors alteration and, on a larger scale, contributing to improvements in policies and provisions of countries for healthy aging. (WHO, 2020a). Lastly, it is advisable to include and utilize new information and communication technologies (Aceto et al., 2020) in building and implementing intervention models in the modern world. Integrating ecological concerns shall also be a priority. Algorithms can be excellent tools for supporting decision-making in interventions promoting healthy aging.

Declaration of Competing Interest

None.

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Aging and Well-Being

Views, Experiences and Contexts

Luísa Grácio[a], Maria João Carapeto[b], Heldemerina Pires[c]

REVIEWED
Marcus Stueck
Sebastian Müller-Haug
Int. Biocentric Research Academy/IBRA

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Martina Goth

AFFILIATION
a Évora University, Department of Psychology, CIEP – Investigation Center for Research in Education and Psychology, University of Évora
Orcid: 0000-0001-9805-3378
b Évora University, Department of Psychology, CHRC – Comprehensive Health Research Center, University of Évora
Orcid: 0000-0001-8912-9916
c Évora University, Department of Psychology, CIEP – Investigation Center for Research in Education and Psychology, University of Évora
Orcid: 0000-0001-8371-3062

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CORRESPONDENCE
Luísa Grácio
Department of Psychology, University of Évora, Departamento de Psicologia, Colégio Pedro da Fonseca, Parque Industrial e Tecnológico de Évora, Rua da Barba Rala 7005-345, Évora, Portugal.
E-mail: mlg@uevora.pt

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www.schibri.de

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ABSTRACT

The growing aging of the population has brought to the fore the problem of how to age with greater quality of life and well-being. The goal of this work is to review and reflect on the research that we have been developing to improve our understanding about the factors associated with well-being and quality of life in aging. First, a set of studies aimed to understand the point of view of the elderly about specific contexts of their lives. Some studies focused the rights that the elderly perceive to have in the residential structures where they live. Other studies, with elderly people who live in their own home, intended to enlighten the role of spirituality/religiosity or the perceived contribution to well-being of attending a senior university. A second set of studies provided some contributions to understand how youth describe the positive functioning of middle-aged and elderly people, or how the perception of affection received from grandparents is associated with the well-being of youth. Questions for future research are also discussed.

KEYWORDS
Elderly, lifelong learning, quality of life, spirituality, positive functioning

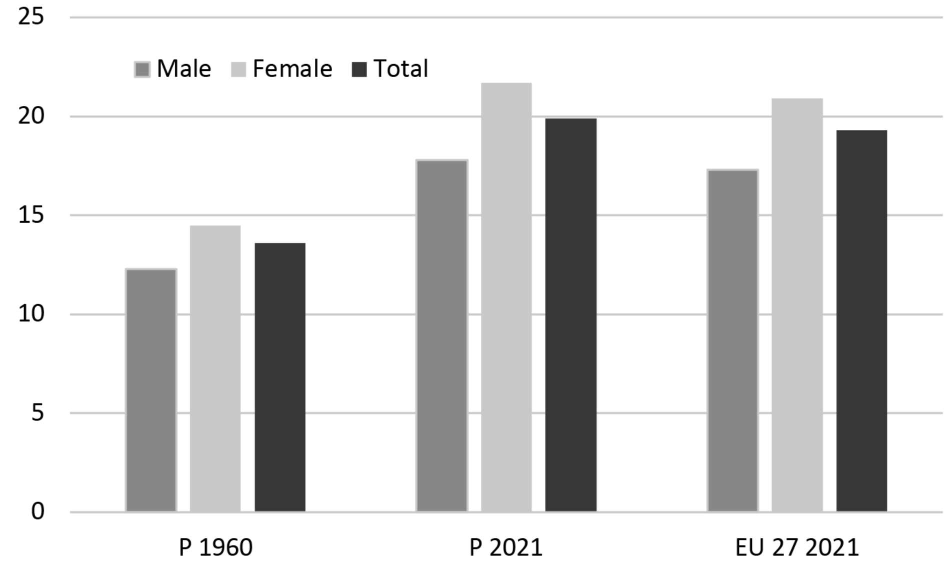
Aging and Well-Being: Views, Experiences and Contexts

The growing aging of the population has brought to the fore the problem of how to age with greater quality of life and well-being. In Portugal, life expectancy has increased and is among the highest in Europe (Figure 1), but the remaining years of healthy life after 65 has not followed this growth: in fact, the number of years of healthy life after 65 has decreased for Portuguese women (Figure 2; PORDATA, n.d.). With this in mind, we have been developing a set of studies to examine how Portuguese elderly perceive and experience their lives, focusing some specific contexts they live in, and looking for possible modifiable risk and protective factors.

Quality of Life and Well-Being: The Voice of the Elderly

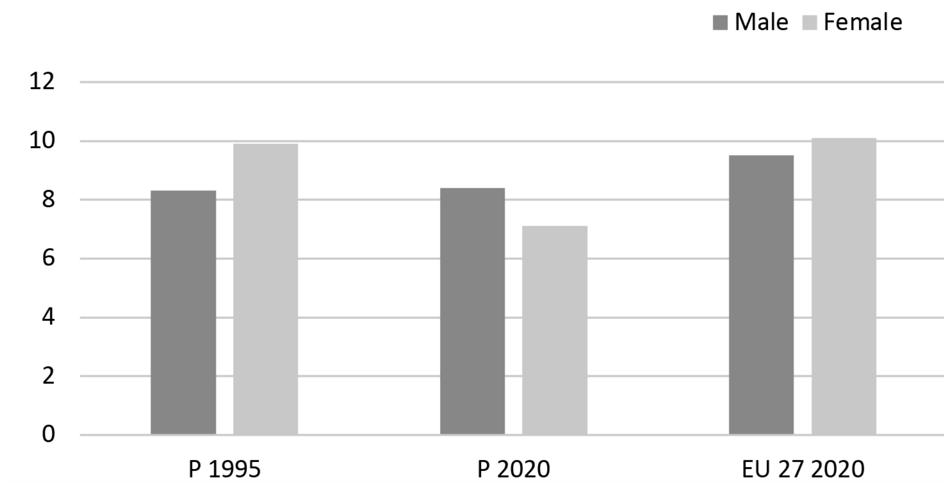
We have been interested in the point of view of the elderly about their lives. Therefore, quality of life (QoL) and well-being (WB) models have provided a theoretical background for much of our work to date. In the same vein, qualitative studies have been preferred; this option allowed us to get data about the perspectives of illiterate persons, a very common condition among Portuguese seniors.
According to the World Health Organization (The WHOQOL Group, 1998), QoL refers to the individuals' perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns. It is a broad ranging concept affected in a complex way by the persons' physical health, psychological state, level of independence, social relationships and their relationship to salient features of their environment (p. 1570).
Despite the diversity of QoL models, it is widely accepted that it comprises multiple dimensions in people's lives and encompasses both subjective (the individual's point of view) and objective (proxy's, professionals, etc. points of view) aspects. Schalock and Verdugo (2003)'s model, an influential model in the field (Vanleerberghe et al., 2017),

Figure 1
Years of life expectancy at 65



Note
P – Portugal
EU 27 – European Union (27 countries)

Figure 2
Remaining years of healthy life at 65



Note
P – Portugal
EU 27 – European Union (27 countries)

propose that QoL comprises eight dimensions: personal development, self-determination, interpersonal relationships, social inclusion, rights, emotional well-being, physical well-being and material well-being. These dimensions are universal but their importance for individuals' global QoL can vary according to sociocultural and developmental factors. However, systematic research to enlighten which dimensions are more relevant for seniors is scarce (e.g., Vanleerberghe et al., 2017). Beyond QoL, diverse well-being models have been considered to understand older people's experiences. First, the concept of subjective well-being (SWB) (Diener, 2000), which values individual's hedonic point of view and comprises the dimensions of satisfaction with life (overall or in relation to different dimensions of life) and positive and negative affectivity. Satisfaction with life and negative affect are relatively stable across the lifespan but positive affect seems to diminish (Jebb et al., 2020). Second, the psychological well-being (PWB) model, which refers to the intrapersonal experience of well-being of the person towards him/herself, comprising dimensions such as self-acceptance, positive relationships with others, autonomy, mastery of the environment, purpose in life, and personal growth (Ryff, 2014). Finally, the social well-being (SoWB) model, which is interested in the person's functioning and adaptation in the context of society, considering social integration, social contribution, social actualization, social coherence, and social acceptance (Keyes, 1998). PWB and SoWB are two distinct but related concepts; Keyes et al. (2002) found that optimal well-being (high values in both subjective and psychological well-being) increases with age and adults with higher psychological than subjective well-being tend to be younger. Young and middle-aged adults show higher levels of purpose in life and personal growth than the elderly, but not in the other dimensions of BEP (Ryff, 2014).

Our research was thus engaged with understanding how Portuguese elderly perceive and experience their lives, focusing some specific contexts they live in, and looking for possible modifiable risk and protective factors. Theoretically, QoL and well-being models were a reference; methodologically, qualitative studies have been privileged so far.

Research on the Elderly's Point of View

A set of our studies aimed to understand the point of view of the elderly about specific contexts of their lives, such as the rights they perceived they have when living in a nursing home, the role of spirituality/religiosity in widowed elderly who live in their own home, or the perceived contributions to well-being of attending a senior university.

How do older people perceive and experience their rights in nursing homes? Twenty widowed individuals, aged 80 to 91 years-old, some with no literacy skills, were interviewed in a qualitative (content analysis) and quantitative study (Grácio & Bugalho, 2018, 2019, 2020). Some elderly exhibit the idea that they should have certain rights, above all the right to be well cared. But power to own decision-making is seen as non-existent, thus undermining the sense of agency. Most elderly considered that they can complain, although many say they do not do it because of fear retaliations. The little freedom they have is conditioned by the nursing home rules and its professionals. The limitation of the rights of the elderly in an institutional context in which everything is dependent on the power and will of the agents who work there, is a risk factor for the maintenance of identity, development and self-realization of the elderly. The implementation of formal evaluation and monitoring processes, external and internal, which include representatives of the elderly and use participatory and confidential methodologies, could positively contribute to fill some of the existing gaps.

Intimate experiences such as those related to religiosity and spirituality were also of interest to us. Formerly, religiosity and spirituality have been considered as having deleterious effect on individuals' mental health, autonomy, and full personal realization (e.g., Freud, 2001). However, more recent psychosocial approaches become interested in its adaptive potential or religious coping (e.g., Koening et al., 2012). Conceived differently from religion, religiosity is understood as a practice, which can be institutional (or not), through participation in ceremonies (or not), but mainly as an intrinsic experience of each individual; on the other hand, spirituality was conceived as a personal search for answers about the meaning of life and the relationship with the sacred/transcendent (Koening et al., 2012). We aimed to understand the role of religiosity/spirituality for elderly's QoL and well-being, from their own standpoint (Grácio et al., be published). Semi-structured interviews to 20 widowed elderlies (71 to 92 years old), living in their own homes in a small town in South Portugal, made evident that elderlies believe that spirituality/religiosity improves their own satisfaction with life. They described their religious practices, such as praying, have faith, talk with and pour their heart out to God, ask for protection or going to mass, and respective beneficial outcomes, such as safe haven, unconditional support, acceptance of life or companionship. In particular, spirituality/religiosity emerged as a strategy to cope with preoccupations and covid-19 pandemic, and a source of support when social support lacks.

A specific, recent context in older people lives are the senior universities that emerged in Portugal in the last decades. Grácio and colleagues (2022) aimed to understand to what extent attending a senior university is perceived by the elderly as contributing to their own QoL and well-being. During the pandemic period, 50 users (60-90 years old) of the Senior University of Évora, Portugal, responded to a written questionnaire. The content analyzes suggested that attending the Senior University had a positive impact on all aspects of QoL and well-being explored. The main gains and aspects of greater satisfaction are related to learning, social integration, interpersonal relationships, building friendships and conviviality.

Youths' Point of View on Aging and the Elderly

A second set of our studies focuses on the point of view of youth about ageing and the elderly, namely on how youth describe the positive functioning of middle-aged and elderly people and how the perception of affection received from grandparents is associated with youth's well-being.

In a study we aimed to explore the criteria that youth use to describe the positive functioning of middle aged and elderly adults (Carapeto et al., 2021). Is it consistent with theoretical models of well-being and quality of life? A written questionnaire was administered to 28 college students (mostly female, 18–25 years old). They were asked to identify descriptors of 4 middle aged and elderly acquaintances (both genders) that live well their present life stage and the answers were content analyzed. They provided 434 descriptors of 55 middle aged persons (47.65 years in average) and 52 elderly (76.38 years in averaged). Findings revealed that the criteria used by youth is consistent with theoretically proposed developmental tasks and dimensions of subjective and psychological well-being (no mention of social well-being contents). Positive relations with others followed by purpose in life were the most frequently mentioned for both middle aged and elderly. Positive functioning, in the elderly, was more related to the exhibition of physical health and positive affect, and in the middle aged was more related to job and professional career issues. A new question emerged for future research: Maybe young people is less sensitive to inner signs of positive functioning in middle aged and elderly people (less mentioned), which are out of the scope of their own experience as young people.

The emerging interest in intergenerational issues explores more frequently the beneficial effects of the interaction between younger and older people for the older people well-being. On the contrary, the goal of a quantitative study from our team (Lança, 2021; Pires & Lança, to be published) was to understand the relationship between college students' psychological well-being and their own perception of the affection received from grandparents. The findings (from 240 Portuguese college students, 18 to 25 years old) suggested that college students' psychological well-being was related to love and esteem, affection, and memories and humor, received from grandparents – but not to the commemorative dimension. Mansson, Floyd e Soliz (2017) concluded that the commemorative dimension contributed the least to the affects that young adults received from their grandparents. Together with other research, it seems reasonable to stand that the relationship between grandparents and grandchildren is beneficial for the well-being of both.

Conclusions

The reviewed research revealed different life contexts and experiences that seem to have a potential to improve elderly's QoL and well-being, such as the participation in a senior university or religiosity/spirituality experiences. Also highlights the work that needs to be done in terms of implementing the rights of the elderly living in nursing homes. Elderly's QoL and well-being is less a reality than would be possible or desirable, e.g., rights are not fully fulfilled.

Conversely, it was suggested that the interaction with grandparents has the potential to contribute to youth well-being and that youth believes about old people's positive functioning attends more to elderlies' superficial than to their internal experiences.

Further research is needed to deepen knowledge about elderly´s views, experiences and contexts, that favor their QoL, well-being and inclusion. Ongoing studies carry further into positive psychology and Baltes' selection-optimization-compensation (Baltes et al., 2006) approaches, for instance to characterize the daily experiences, events and activities (external) and memories and thoughts (inner events), both pleasant and unpleasant, of elderlies living in a nursing home, or understand older adults' views on the gains and losses associated with their own aging processes and how they cope with losses.

Author contributions

LG, MJC and HP: conceptualization, methodology, and project administration, formal analysis and writing – review and editing. MJC and LG: writing – original draft. All authors contributed to the article and approved the submitted version.

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Digital competencies in international comparison

A challenge for society as a whole

Tim Tischendorf[a], Tom Schaal[b]

REVIEWED
Marcus Stueck
Sebastian Müller-Haug
Int. Biocentric Research Academy/IBRA

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EDITED
Martina Goth

AFFILIATION
a Faculty of Health and Healthcare Sciences, University of Applied Sciences Zwickau
Orcid: 0009-0006-5567-0134
b Faculty of Health and Healthcare Sciences, University of Applied Sciences Zwickau
Orcid: 0000-0003-1122-2226

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Tischendorf, T., Schaal, T. (2023). Digital competencies in international comparison. BIONET Journal of Biocentric Sciences, Vol. 4, S. 49–52.

CORRESPONDENCE
Tom Schaal
University of Applied Sciences Zwickau
Kornmarkt 1
DE-08056 Zwickau
email: tom.schaal@fh-zwickau.de

Open access Journal, Download:
www.bionet-research.com
www.schibri.de

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Explanations
Conflict of interest: the authors declare that they have no competing interests.
The results of the online survey do not contain any patient-related or other sensitive data. Individuals were informed about the purpose of the survey in a cover letter. Participation in the study was thus voluntary and anonymous. The survey was conducted in accordance with the ethical standards of the Declaration of Helsinki.
Availability of data and material: All data generated or analyzed as part of this study are included in the supplementary information files.
Code availability: The data were used for descriptive calculations only. The dataset is provided in full as an e-supplement.
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Author contributions
TT: Statistical analyses, wrote the manuscript.
TS: Questionnaire co-developed and released, advice on statistical analysis, manuscript corrected and released, project responsibility.

ABSTRACT
The European Union defines digital competencies as one of the eight key competencies for lifelong learning. This paper examines the extent to which differences exist regarding digital competence in Germany in an international comparison in the science sector. The study was based on the DigKomp 2.2 survey instrument according to the reference framework of the European Union. Designed as a convenience sample, digital competencies of international alumni from the science sector in DCA countries were evaluated in comparison to German reference values. Both the mean values of the group of international alumni and the German reference values indicate good digital competence, with the German reference values predominantly demonstrating higher digital competence. The education sector should see itself as a mediator between employees and employers – who are increasingly demanding a high level of digital skills – when training specialists at colleges and universities.

KEYWORDS
digital competence, digitalization, lifelong learning

Background

Digitization is transforming our lives and harbors many opportunities. Within a very short time, it has fundamentally changed everyday habits as well as economic processes. The number of Internet users worldwide has risen continuously and is estimated to be around 5.3 billion in 2022. This means that the number of so-called Onliners has increased by around 2.9 billion within ten years[1]. Alongside other basic skills such as reading, arithmetic and writing, the European Union (EU) defines digital competence as one of the eight key competencies for lifelong learning[2]. According to this definition, digital competence includes the safe and critical use of digital technologies, which are used for information, communication, and problem-solving strategies in all areas of life[3]. In this context, a study by the EDCL Foundation (2014) warns of a possible fallacy associated with the so-called digital natives. Just because a person has grown up surrounded by computers, cell phones, and other digital devices does not automatically make them digitally literate, they argue. Their skills in using technology safely and effectively and informally acquired skills are likely to be incomplete [4]. This leads to a new digital divergence between digital lifestyle skills and digital workplace skills, which should not be discounted and means that young people are not automatically exempt from digital literacy education[4].

In terms of international comparison, Germany is in 13th place in the European ranking of the digital economy and society in 2022. Leading the way are the Scandinavian countries Finland and Denmark[5]. In a survey conducted in May and June 2021 by the ifo Institute (Leibniz Institute for Economic Research), 56 percent of respondents in Germany at the time of the survey said that digital and media skills were very important for the future of society. A further 36 percent rated them as rather important.

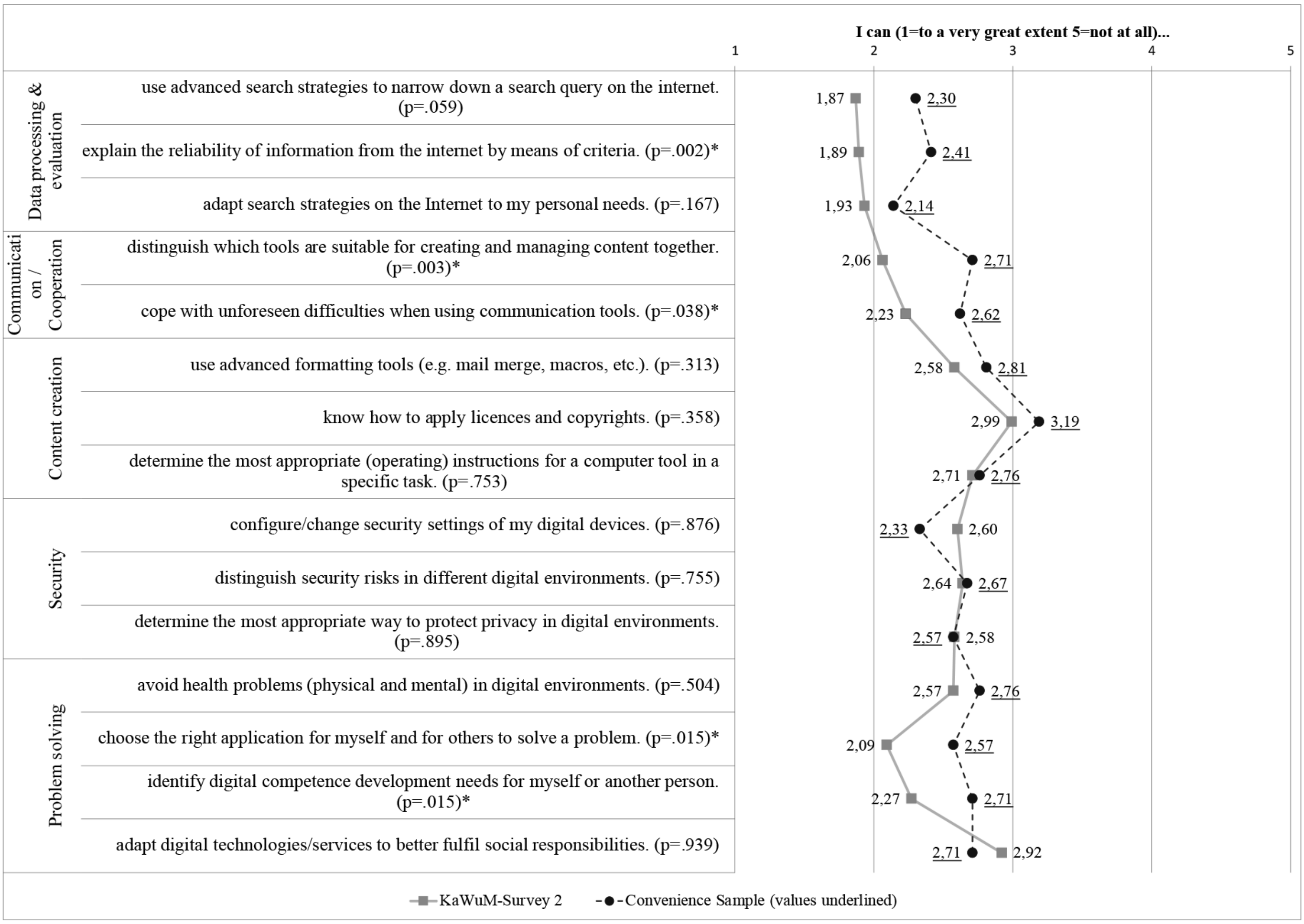
To illustrate the relevance of digital competencies, the global megatrends should not go unmentioned. In this context, they include globalization, artificial intelligence, health and, finally, digitization[6]. To be able to act efficiently and to participate in international comparisons and competition, digital competencies are among the essential areas of competence in dealing with such far-reaching changes as the aforementioned megatrends[6].

Based on the study results for determining career paths and qualification requirements in science and university management (KaWuM) using the DigKomp 2.2 questionnaire in Germany, this study aims to show how digital competence is assessed in countries receiving official development assistance (ODA, DAC List of ODA-eligible countries). The DigKomp 2.2 was used as the basis for recording digital literacy characteristics in accordance with the EU reference framework.

Methodology

Against the background of globalization and networking of researchers from different countries worldwide, it is particularly important to survey digital competencies with the help of a uniform construct. The DigKomp 2.2 construct according to Krempkow (2022) represents a theoretically and empirically based survey instrument for recording digital competencies according to the DigComp2.1 reference framework of the EU[7], which was used in the Germany-wide KaWuM Survey 2 in 2022[8]. The KaWuM Survey 2 collected comparative data from over 1,200 science managers. In addition, there is a student survey of about 7,000 students, from several large universities in Germany, across all subject groups. The DigKomp 2.2 questionnaire captures with 15 items all five dimensions (sub-

Figure 1 Mean values of the digital competencies recorded (*difference statistically significant)



scales) of digital competencies according to DigComp2.1. The subscales are (1) data processing/evaluation, (2) communication/collaboration, (3) content creation, (4) security, and (5) problem solving. They are answered on a five-point response scale: 1 = to a very great extent to 5 = not at all[8]. In addition, an open-ended knowledge test question is asked to capture the magnitude of, in some cases, suspected overconfidence in data processing/assessment.
For the present study, the English DigComp 2.2 reference framework was used and made available as an online survey via the SosciSurvey survey platform to participants during a one-week training event via a QR code or URL[9]. After answering sociodemographic questions on gender and country of origin, the five dimensions of the DigKomp 2.2 questionnaire were evaluated.
The participants were scientists from DAC countries who received a DAAD scholarship as part of their studies or graduated in Germany. The conference took place from June 12–16, 2023. Due to the favorable opportunity of the evaluation, the methodological decision was made to use the convenience sample, which is widely used in academic social research. In this non-probabilistic sampling, individuals are randomly selected for the sample of a study who are currently available or easily accessible[10]. Descriptive and inferential statistical data analysis was performed using IBM SPSS Statistics 29. One-sample t-tests were performed ($p < .05$, two-tailed). Except for one item, the convenience sample items were not normally distributed (Shapiro-Wilk test). Only mean values were available for the reference values of the KaWuM Survey 2, so non-parametric tests were not used. Simulation studies have shown that the t-test is largely robust to violations of the normal distribution assumption and was found to be appropriate in the following analysis[11].

Results

All participants of the event were invited to the survey and took part in the approximately seven-minute interview (n = 28). Twenty-three participants each assigned themselves to the female and male gender, respectively, and two respondents made no statement. Alumni came from a total of 15 nations. These included Kazakhstan (n = 4), Kyrgyzstan (n = 3), Armenia (n = 2), Georgia (n = 2), Colombia (n = 2), Kenya (n = 2), Palestine (n = 2), Vietnam (n = 2), and Algeria (n = 1), Egypt (n = 1), Ethiopia (n = 1), Indonesia (n = 1), Romania (n = 1), Uzbekistan (n = 1), and Venezuela (n = 1). Two participants did not provide any information regarding their country of origin.
The differences in the mean values of the digital competencies were significant for 5 of 15 items (Figure 1). In addition, an open knowledge question was asked as free text in connection with the first dimension of data processing/evaluation. This included a question about what search strategies respondents use to find reliable information on the Internet. Of the 30 respondents, a total of twelve answered this question. The most frequently given answer was so-called keywords (n = 4). Furthermore, Google (n = 3) and 2 Scientific research (n = 2) were mentioned. The answers „Intuitive strategies“ (n = 1), „Engineering specialized web sites“ (n = 1) and „Many different ones, e.g. search operators, truncation, various search engines and languages“ (n = 1) could not be categorized.
In addition, the mean values for each of the five dimensions of digital competencies according to DigKomp 2.2 were calculated and tabulated for further comparison (Table 1).

Table 1 Overview of mean values per dimension of digital competencies

Dimension	DigKomp 2.2	Convenience Sample
Data processing & evaluation	1,9	2,3
Communication/Cooperation	2,1	2,6
Content creation	2,8	2,9
Security	2,6	2,5
Problem solving	2,5	2,7

Ratings 1–5 (1 = to a very great extent, 5 = not at all)

Discussion

The aim of this study was to identify possible differences in digital competencies in Germany in an international comparison of the science sector in DAC countries. If we first look at the five superordinate categories of DigKomp 2.2 according to Krempkow in this context, the greatest differences emerge for the first two dimensions of data processing/evaluation and communication/collaboration. In both categories, the German reference values can be classified above the mean values collected in this survey. Particularly in connection with the dimension of data processing/evaluation, statistically significant differences were found between the German and international values for the item “I can explain the reliability of information from the internet by means of criteria”. Regarding the knowledge question included in this dimension, it should be noted that the majority of the free text answers given by the international alumni indicate that they refute potential tendencies to overestimate themselves. However, the answers are not very detailed and leave a lot of room for interpretation, although “Google” as an answer represents a search engine and rather indicates an overestimation of digital competencies. The results of Krempkow et al. 2022 can be used to classify the results of the knowledge question. According to this, an overestimation of students’ competencies was found in response to the naming of search strategies on the Internet, with which the search is adapted to personal needs[12]. Differences between knowledge and action competence would potentially be possible, e.g., through observational studies under a higher resource input[8].
Regarding the second dimension of communication/cooperation, it can be seen that for both items the differences between the German and international values are statistically significant. Accordingly, the German reference values were significantly higher than the mean values of the international alumni. Early involvement and empowerment to discuss digital team tools, already in (academic) education, can make a decisive contribution here. In this context, among others, the EDCL Foundation study (2014) makes clear that a clear distinction should be made between “digital lifestyle” and “digital work-

place skills"[4]. These digital lifestyle skills are not the skills that are necessary, for example, to get a job, engage with government, or manage health care, for example. The latter skills require formal and structured training[4].

The following two competence categories, content creation and security, can be evaluated relatively homogeneously or with minor deviations. No statically significant differences emerged from the items in the respective categories. In connection with the dimension of security, it should be noted that the group of international alumni is slightly above the German reference values. One explanation for the homogeneity in dealing with security settings, risks and the protection of privacy in the digital environment may lie in the sensitization in the context of the General Data Protection Regulation (GDPR). The GDPR is an EU regulation that standardizes the rules for processing personal data throughout Europe[13].

In the fifth and final dimension of the digital competence survey, the German reference values are slightly higher than those of the international alumni. In particular, statistically significant differences were found for the items "I can choose the right application for myself and for others to solve a problem" and "I can identify digital competence development needs for myself or another person". Digital competencies for problem solving or related approaches represent an endpoint of digital competencies, which is based on previous basic competencies[2]. If fundamental skills in dealing with digital technologies are poorly developed, this results in further competence deficits in the search for solutions to problems.

The study results are based on a convenience sample and can provide an impetus to the question raised, but generalizations to all DAC countries are not possible[10]. Furthermore, a sampling bias cannot be excluded, since participants of the event did not necessarily correspond to the population of scientific personnel in their country of origin regarding qualification and knowledge acquisition. It should be noted that self-assessments tend to reflect self-perception correctly[8]. The uncertainties identified in this context of digital competencies can be used as thematic foci and characterized in more detail in further work.

Conclusion and outlook

In conclusion, both the mean values of the group of international alumni and the German reference values indicate good digital competence, with the German reference values predominantly demonstrating higher digital competence. Given the fact that new digital technologies are emerging and penetrating various areas of companies and the economy at high speed, the development of workers' digital skills becomes a long-term task and part of lifelong learning. The education sector in particular should see itself as an intermediary between employees and employers – who increasingly demand a high level of digital skills – when training specialists at colleges and universities.

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Parental Burnout and Family Resilience

Maria João Beja[a], Gloria Franco[b], João Almeida[c]

REVIEWED
Marcus Stueck
Sebastian Müller-Haug
Int. Biocentric Research Academy/IBRA

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EDITED
Martina Goth

AFFILIATION
a University of Madeira
Orcid: 0000-0003-0501-1748
b University of Madeira
Orcid: 0000-0001-8634-9120
d University of Madeira
Orcid: 0009-0008-7520-2789

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CORRESPONDENCE
Marfia João Beja
email: Maria.joao.beja@staff.uma.pt

Open access Journal, Download:
www.bionet-research.com
www.schibri.de

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ABSTRACT

This research seeks to establish correlations between parental burnout and family resilience and several sociodemographic variables that have been described in literature as influences to the levels of parental burnout. The study had a sample of 209 individuals, 169 were women (79.4%) and 41 were men (19.6%), the average age was 41.19 years old, the oldest is 66 years and youngest 21 years old. The protocol includes a sociodemographic questionnaire, a Parental Exhaustion Assessment Questionnaire (QAEP) and the Walsh Family Resilience Questionnaire (WFRQ). This protocol was applied online in Google Forms. The results indicate that there are age differences in the levels of parental burnout and significant negative correlations between parental burnout and family resilience. Family resilience predicts parental burnout.

KEYWORDS

Family Resilience, Bornout, Coping

Introduction

Parenting is a quite pleasurable function for most fathers and mothers. However, the exercise of parenting can cause feelings of exhaustion, saturation and lack of pleasure in being with their children, especially when parents do not have the tools or resources necessary to deal with stressful situations related to parenting, which leads to emotional exhaustion and the development of Parental Burnout. Prolonged exposure to these feelings causes great suffering in parents and leads to a deterioration in the quality of care given to their children (Mikolajczak & Roskam, 2019).

Parental burnout

Burnout can be defined as a state of intense exhaustion related to the parental role, in which parents become increasingly emotionally distant from their child, less and less involved in their relationship and interactions are limited to functional aspects. This too is the result of a chronic imbalance in which the risks outweigh the resources parents have to deal with stressful situations. This leads them to doubts in their own abilities as parents and lost of the pleasure of having children (Mikolajczak, Gross & Roskam, 2019, Mrosková, Reľovská & Schlosserová, 2020).

Burnout is characterised by four dimensions: emotional exhaustion, emotional detachment, saturation and contrast. Exhaustion is the first manifestation of burnout reported. Parents feel exhausted, without energy (Mrosková et al., 2020). The emotional detachment that is determined by disinvestment and distance from the child itself and which is manifested by the decrease in the attention given to the child, the slightest involvement, and difficulty in showing affection (Mrosková et al., 2020; Yes, Bourke-Taylor, Fossey & Yu, 2021). Saturation is characterised by the inability of parents to fulfil their parental role: parents lose the pleasure they once had in fulfilling that same role. As for the contrast, this is determined by the perception their that there are differences between the parents they used to be and who they are currently.(Mrosková et al., 2020; Mousavi, Mikolajczak & Roskam, 2020)

This exhaustion happens when parents do not have the necessary resources to deal with the stressors related to the parenting role. These resources can range from financial resources to emotional resources including social support, parental cooperation, sufficient leisure time (Brianda et al., 2020; Roskam, Brianda & Mikolajczak, 2018). Often what anticipates exhaustion is the over-investment in their parental role, which leads them to expect and want to be perfect, which puts self-pressure on the parents themselves and the tendency to predict the child's future (Brianda et al, 2020; Furutani, Kawamoto, Alimardani & Nakashima, 2020).

Gender differences in parental burnout

burnout affects both genders equally (Roskam & Mikolajczak, 2020; Mousavi, 2020; Szczygieł, Sekulowicz Kwiatkowski, Roskam & Mikolajczak, 2020). However, it is expected that women are more prepared to deal with the demands linked to raising children than men, and that, therefore, they are more resistant to imbalances between resources and risks.Expressly, women are only expected to enter burnout when the balance is negative (risks are greater than resources), while men are expected to enter burnout, before there is even this imbalance (Roskam & Mikolajczak, 2020; Mousavi, 2020; Cheng, Wang, Wang, Li, Liu & Li, 2020).

Parental identity is more crucial and salient for women than for men. Therefore, any attempt to inhibit non-normative behavior is less frequent in men than in women. This means that there may be a moderating effect of gender on the relationship between parental burnout and escape ideas and negligent behaviors, as these behaviors are more frequent in men (Roskam & Mikolajczak, 2020; Mousavi, 2020; Sodi et al, 2020).

Given Bandura's (1977) theories of social roles and social learning, broader gender norms beyond parental identity may help explain differences in escape ideation and neglectful behavior. As mothers are socially seen as caregivers to children, it is expected that they are extremely involved and available to children, and children themselves seek mothers more for emotional support (Roskam & Mikolajczak, 2020; Mousavi, 2020; Gannagé, Besson, Harfouche, Roskam & Mikolajczak, 2020). That said, it is normal for women to be more likely to escape their parental roles and to have more aggressive behaviors than men, which are seen as acceptable if they exclude themselves from those same roles (Roskam & Mikolajczak, 2020; Mousavi, 2020; Arikan, Üstündağ-Budak, Akgün, Mikolajczak & Roskam, 2020).

Family resilience

Family resilience can be defined as a trait, as a process, or as an outcome. As a trait, it is seen as a mechanism that is strongly influenced by protective factors responsible for the reorganization of the family after an adversity. As a process, it is seen as something that is built by the family's success in using coping strategies to deal with stressful events (Henry, Sheffield Morris & Harrist, 2015). It is unclear whether resilience is a process leading to a positive outcome, or whether it is the outcome itself. For Hjondal et al (2007) cited by Henry et al. (2015) state that defining resilience as an outcome is counterproductive as it focuses on the end and not on the process. They propose to define resilience as a process in order to have the possibility of exploring the dynamic role of various resources. Therefore, Walsh explains family resilience as a dynamic process of self-perseverance and growth that takes place in response to a crisis, and that includes key processes that promote family capacities to overcome barriers and maintain family functions.

In general, family resilience is defined as the family's ability to reduce the impact of one or various stressful situations through relational processes that allow responding to the demands of the situation and that allow activating resources that help to solve the problem. The family ,s ability to deal with and adapt to adversities is related to four aspects: the characteristics of the individuals that make up the family system, the families' internal resources, the community resources available to the family and, finally, the family's own perception of adversities. It is the dynamic relationship between these factors that will define the system's ability to restore balance by reducing demands, improving responsiveness and restructuring the meanings of stressful events. These components are relevant to understanding the functionality of the family, since they can indicate elements of risk and protection for development, as risks and opportunities can occur in a proximal and distal context (Saltzman, Pynoos, Lester, Layne Beardslee, 2013).

For Walsh (2016), families in the face of adversity are organized according to three key processes identified by in his theory of family resilience and which represent family processes in stressful situations: the belief system, organizational patterns and communication processes. Within the first process, there are the following facilitators of the existence of resilience: giving meaning to crises and challenges, that is, resilient families see crises as challenges shared by the family, believe that they can better respond to a crisis if they are united, and see challenges as something that can be managed and can contribute to growth and change in the family life cycle (Walsh, 2016). Maintaining a positive outlook: resilient families have a positive outlook on life through their family strengths and potential in the midst of a crisis, manage to encourage their members and reinforce the feeling of confidence that they can overcome crises (Walsh, 2016). Transcendent value and spirituality: resilient families find meaning and purpose beyond themselves and their problems. This can be defined as the family's moral and spiritual values which become a source of strength. Many families find strength through cultural and religious traditions (Walsh, 2016). With regard to organizational patterns, the key concepts in this domain are: the flexibility of resilient families, they have a flexible structure that modifies according to needs and challenges, which allows greater adaptation to changes caused by crises or adversities. Resilient families reorganize themselves during crises, but they do not go back to the way they were before (Walsh, 2016). In the domain of communication, the key concepts are: the clear and consistent communication that exists in resilient families. These families communicate directly, clearly, specifically and consistently and there is mutual help among all members, there is encouragement to share feelings, opinions and better decision-making in response to the crisis (Walsh, 2016).

Burnout and Family Resilience

Not all parents feel "Parental Burnout" or are affected by any other type of stressful event, whether related to their own parental role, or to some external event. One of the factors that may help answer the question of why some parents go into Parental Burnout and others don't is precisely family resilience (Sorkkila & Aunola, 2020).

Resilience can help protect against a wide range of adversities: from everyday problems to traumatic events, and it may explain why some people survive difficult life experiences. In the context of parenting, family resilience is associated with adaptive parenting styles characterized by acceptance and involvement, and programs based on resilience have been successfully used and contributed to strengthening parents and children and their respective skills (Sorkkila & Aunola, 2020).

As in other contexts in which resilience has already been investigated,specifically in the field of sport: student athletes with higher levels of resilience are less likely to develop Burnout. This same idea applies to family resilience: parents who play their role as parents more flexibly and with better resource management are less likely to ever develop Parental Burnout (Sorkkila & Aunola, 2020).

For this study, the following specific objectives were defined: i) to describe parents who are experiencing parental burnout, ii) to evaluate the relationship between sociodemographic characteristics (gender and age) and parental burnout, iii) to evaluate the relationship between parental burnout and family resilience

Participants and procedure

209 individuals participated, of which 169 are women (79.4 %) and 41 are men (19.6 %). The average age of the sample is 41.19 years, the oldest individual is 66 years old, and the youngest is 21 years old (SD = 9.05). Regarding the level of education, 2 of the individuals have less than the 4th year of schooling (0.9 %), 4 have the 4th year (1.9 %), 5 with only Preparatory Education (2.4 %), 21 have the 9th year (9.9 %), 58 have the 12th year (27.4 %), 81 have a graduation (38.2 %), and finally, 30 have a master's degree (14.2 %).

The participants have one child (M o = 1), with 109 parents living with 1 child (51.5 %), 75 living with 2 children (3.5 %), 22 living with 3 children (10.4 %), and 3 parents living with 4 children (1.4 %). As for marital status, 158 are married (74.5 %), 22 are single (10.4 %), 27 are divorced (12.7 %) and 2 are widowed (0.9 %). As for the type of family, most subjects, 149, live in a two-parent family (70.3 %), 38 in a single-parent family (17.9 %), 8 live in a blended family (3.8 %), 7 in a multigenerational family (3.3 %) and 7 answered "Other" (0.5 %).

The protocol consisted of three instruments: a sociodemographic questionnaire, to collect information that would allow characterizing parents and families, an instrument to measure burnout, the Parental Exhaustion Assessment Questionnaire, created by Roskam et al. (2018), and Walsh family resilience Questionnaire (Walsh, 2015), adapted to the Portuguese version by Sequeira & Vicente (2019), to assess family resilience. Data were collected online using a form developed in Google Forms. The questionnaire was disseminated on social networks, emails and contact networks. This data was collected during the Covid-19 pandemic, namely during the second confinement, between April 15 and May 21, 2021.

The Parental Exhaustion Assessment Questionnaire (Roskam et al., 2018) and adapted to the Portuguese version by César et al. (2018), consists of 23 items that are classified on a seven-point Likert scale, with 0 meaning "never" and 7 meaning "daily"). O instrumento possui quatro subescalas: Exaustão, que diz respeito a estar emocionalmente e fisicamente exausto das tarefas parentais (eg, sinto-me completamente esgotado/a enquanto pai/mãe), o Distanciamento emocional que diz respeito à distancia afetiva com filho(s) (eg, faço o mínimo que é suposto fazer para o/a(s) meu/minha(s) filho/a(s), mas não mais que isso), a Saturação que diz respeito ao estar cansado do papel parental (eg, eu não suporto meu papel como pai/mãe mais), e por último ao Contraste que diz respeito ao sentir-se distante da imagem desejada de pai/mãe, com os sentimentos de culpa associados, o "eu" pai/mãe era anteriormente contrasta com "eu" pai/mãe de agora (eg, eu não acho Eu sou o bom pai/mãe que costumava ser com meu(s) filho(s). A aferição realizada para a população portuguesa indica alfas de Cronbach de .97 para a escala global e de .80 a .97 para as quatro subescalas. Neste estudo foram encontrados para a escala global um alfa de Cronbach de .95, para a subescala Exaustão .96, para a subescala Contraste de .96, para a subescala Saturação .96, e para o Distanciamento .97.

The Walsh family resilience Questionnaire (Walsh, 2015, adapted to the Portuguese version by Sequeira & Vicente, 2019) consists of 32 items and a Likert-type scale ranging from 1 "Rarely/Never" to 5 "Almost Always", organized into three dimensions: the belief system, organizational patterns and communication/problem-solving processes.

The belief systems scale has three subscales adversity (eg "Our family faces difficulties together as a team, not individually"), positive outlook (eg "We remain hopeful and confident that we will overcome difficulties"), transcendence and spirituality (eg "We share important values and life goals that help us overcome difficulties. The organizational standards scale involves flexibility (eg "We are flexible in adapting to new challenges"), family cohesion (eg "We count We work with family members to help each other through difficulties"), and social and economic resources (eg "We can count on the support of friends and our community"). Finally, the scale of communication and problem-solving processes comprises clarity (eg "We seek information and clarification about our stressful situation and the options available to us, emotional expression (eg "We can express negative and difficult feelings"), and collaboration in problem solving ("We collaborate in discussion and decision-making and deal with disagreements fairly") (Karaminia, Haji, Salimi, & Tahour, 2018). In the present study, the instrument demonstrated good internal consistency: the total scale has a Cronbach ,s alpha of 0.838, the Belief Systems subscale has a Cronbach ,s alpha of .71, the Organizational Patterns subscale has a value of 0.80, and the Communication and Problem Solving subscale has a value of 0.87.

Participants were informed about the research protocols and completed an informed consent form. All privacy and confidentiality principles of the data collected in the context of this investigation were complied with.

Results

Of the 209 individuals studied, 18 individuals (8.6 %) were identified with parental burnout with a minimum significant value of 93 and a maximum of 145 (M = 114.05, SD = 14.56). Of these individuals (cf. Table 1), 16 are women (88 %) and 2 men (11.2 %), aged between 23 and 48 (M = 36.7, SD = 6.9). Most have a high level of education, Master's (33.3 %) or degree (33.33 %), are married (72.2 %), and live in two-parent families (66.7 %). Finally, they have small children aged between 4 and 7 years (38.9 %).

Difference in levels of parental burnout between genders

Taking into account the results obtained in table 2, it can be stated that, according to the total results of the PBA, there is no significant difference between mothers and fathers (U = 13.500; $p < 0.05$), nor in any of the dimensions, in the exhaustion scale (U = 8.000; $p < 0.05$), in the contrast scale U = 13.500, $p < 0.05$), in saturation (U = 13.500; $p < 0.05$), in distance scale (U = 8.500; $p < 0.05$).

Difference in levels of parental burnout and age of parents and age at which they were parents

As expected, the results shown in Table 3 indicate that the parents' age is linked to parental burnout. As expected, a weak negative correlation was found between parental age and pa-

Table 1 Sociodemographic characteristics of subjects who manifest parental burnout (greater than 92).

	No		M	DP	Minimum	Maximum
Kinship:	**18**					
Mother	16	(88 %)				
Father	2	(11.2 %)				
Age:	**18**		**36.7**	**6.90**	**23**	**48**
Level of education:						
2nd cycle of basic education (Preparatory Education)	1	(5.6 %)				
Secondary Education (12th year)	5	(27.8 %)				
Graduation	6	(33.3 %)				
Master's degree	6	(33.3 %				
Marital status:						
Single	3	(16.7 %)				
Married/De facto Union	13	(72.2 %)				
Divorced/Separated	2	(11.1 %)				
Family Type:						
biparental	12	(66.7 %)				
single parent	4	(22.2 %)				
multigenerational	2	(11.1 %)				
Age of children:						
2 to 3 years old:	2	(11.2 %)				
4 to 7 years old:	7	(38.9 %)				
8 to 15 years old:	3	(16.8 %)				
Other ages:	6	(33.3 %)				
Total:		**100 %**				

Table 2 Mann-Whitney test for differences in levels of parental burnout between genders.

	PBA Total	PBA Exhaustion	PBA Contrast	PBA Saturation	PBA Emotional Distancing
U of Mann-Whitney	13,500	8,000	6,000	13,500	8,500
Wilcoxon W	149,500	11,000	142,000	16,500	144,500
Z	-.351	-1,130	-1,409	-.353	-1.058
Meaningfulness Sig, (bilateral)	,725	.259	.159	,724	,290
sig [2*(1-ended sig.)] The. Grouping Variable: I am a parent b.Uncorrected for links.		.327b	.209b	.732b	.327b

Table 3 Correlation coefficients between parental burnout and parental age

Spearman's Rho	PBA Total	PBA Exhaustion	PBA Contrast	PBA Saturation	PBA emotional distancing
How old is?	-,229**	-,236**	-,195**	-,178**	-,159**

** p<0.01

Table 4 Correlation coefficients between parental burnout and age at which they were parents

	PBA Total	PBA Exhaustion	PBA Contrast	PBA aturation	PBA Distancing
Age at which you were mother /father	-.218 **	-,211 **	-.201 **	-.202 **	-.198 **

Note: ** p< .01

Table 5 Regression model for parental burnout and "First-time mother or father at what age?"

Model	sum of squares	df	Middle Square	Z	sig .
Regression	5958,454	1	5958,454	8,567	.004 b
Residue	143269,469	206	695,483		
Total	149,227,923	207			

Table 6 Template summary for "First-Time Parenting and Parental Burnout "

Model	R	R squared	R squared adjusted	Standard error of estimate
1	,200 to	040	,035	26,372

The. Predictors: (Constant), At what age were you a mother or father for the first time?

rental burnout (r=-.229, p<0.01), as well as with its different dimensions, exhaustion (r=-236, p<0.01), with contrast (r=-.195, p<0.01), saturation (r=-.178, p<0.01) and distancing (r=-.159, p<0.01). Which means that the older the parents are, the lower the incidence of parental burnout and its dimensions.

As expected, and according to Table 4, there is a weak negative correlation between the age at which the participants became parents for the first time and parental burnout (r=-.218, p<0.01) and its different dimensions, exhaustion (r=-.211, p<0.01), and its dimensions, contrast (r=-.201, p<0.01), saturation (r=-.202, p<0.01), distancing (r=-.198, p<0.01). Which means that the younger the age at which they report having become parents for the first time, the higher the values of parental burnout, in its entirety and in the different dimensions.

Table 5 shows how much this regression model between the age at which they became a mother/father for the first time and parental burnout predicts the dependent variable (p<0.004), that is, the model used is adequate for the data. According to this linear regression (cf. table 6), there is no high correlation between these two variables, and the total variance of parental burnout that is explained by the age at which the participants became parents for the first time is situated at 4%.

Relationship between parental burnout and family resilience burnout and family resilience (see Table 7) are moderately negatively correlated (r=-.414, p<0.01), ie, the lower the levels of parental burnout, the greater the family resilience. The same is true of all family resilience subscales: the Belief Systems subscale (r=-.460, p<0.01), the Organizational Patterns subscale (r=-.347, p<0.01), and the communication subscale (r=-.289, p<0.01), with the latter showing weak correlation strength.

With regard to the Exhaustion subscale (cf. Table 7), eta has moderate and negative correlations with all the family resilience subscales: with Belief Systems (r=-.441, p<0.01), with Organizational Patterns (r=-.326, p<0.01), and with Communication (r=-.291, p<0.01), which indicates that the higher the Exhaustion values lower are the values obtained in the subscales Belief Systems, Organizational Patterns and Communication.

With regard to the Contrast subscale (cf. Table 7), similarly to the previous subscale, it is also moderately and negatively correlated with the following subscales of the WFRQ: with Belief Systems (r=-.433, p<0.01), with Organizational Patterns (-.346, p<0.01). With communication (r=-.236, p<0.01), the correlation is weak and negative. Once again, this means that the higher the values obtained in the „Contrast" subscale, the

lower the respective values obtained in the Belief Systems, Organizational Patterns and Communication subscales.
With regard to the Saturation subscale (cf. Table 7), it is also moderately and negatively correlated with the WFRQ subscales: with Belief Systems (r=-.402, p<0.01), with Organizational Patterns (r=-.296, p<0.01) and with Communication (r=-.280, p<0.01), which indicates that the higher the value obtained in the subscale Lower saturation values obtained in the Belief Systems, Organizational Patterns and Communication subscales.
With regard to the Emotional Detachment subscale (see Table 7), it is moderately and negatively correlated with the WFRQ total scale (r=-.370, p<0.01), with the Belief Systems subscale (-.431, p<0.01), and with the Organizational Patterns subscale (r=-.313, p<0.01). With the Communication subscale (r=-.209, p<0.01), the correlation is weak and negative. This means that the higher the Emotional Distance values, the lower the respective values of the Belief Systems, Organizational Patterns and Communication subscales.
Table 8 shows how much this parental burnout and family resilience regression model predicts the dependent variable (p<0.0005), that is, the model used is adequate for the data. According to the linear regression (cf table 9) there is a high correlation between these two variables, and the total variance of Parental Burnout that is explained by Family Resilience is situated at 19.8%.

Discussion

The goal of this study was to understand the prevalence of parental burnout and how various sociodemographic variables such as age, gender, age at which they were parents can be facilitators or inhibitors of parental burnout (Roskam & Mikolajczak, 2020). As well as understanding the relationship between burnout and family resilience and whether this can be a prevention factor.
Burnout, as previously mentioned, is characterized by manifesting itself in four dimensions: emotional exhaustion, emotional detachment, saturation and contrast. It is important to highlight that parental burnout is not a common stress experienced by parents, but is
defined by being a prolonged response to the stress felt by parents and which they often feel is overwhelming and difficult to deal with. (Mikolajczak & Roskam, 2018)
The results of this investigation indicate that in the used sample of 209 individuals, 16 have values indicative of burnout parental (scores equal to or greater than 92). This corresponds to 7.65% of the sample with burnout parental. Taking into account that the incidence in Western countries is between 5–6%, it can be said that the sample used presents values slightly above the expected (Brianda et al. 2020).
Reflecting on the reason for this higher incidence, it is relevant to say that the difficult period experienced by the SARS-

Table 7 Relationship between parental burnout and family resilience

Spearman's Rho	family resilience	Beliefs	Organizational patterns	Communication
Burnout	-,414**	-,460**	-,347**	-,289**
Exhaustion	-.397**	-,441**	-,326**	-,291**
Contrast	-,394**	-,433**	-,346**	-,236**
Saturation	-,364**	-,402**	-,296**	-,280**
Distancing	-,370**	-,431**	-,313**	-,209**

Note: ** *p < .01.

Table 8 Regression model for parental burnout and family resilience (continued)

ANOVA Model	sum of squares	df	Middle Square	Z	sig .
Regression	27761.691	1	27761.691	50.231	,000
Residue	112747,726	204	552,685		
Total	140509,417	205			

Table 9 Regression model for parental burnout and family resilience

Model	R	R squared	R squared adjusted	Standard error of estimate	R square change	Change F	Qf1	Qf2	sig
a.Predictors: (Constant), WFRQ TOTAL	.444	.198	.194	23,509	.198	50.231	1	204	,000

CoV-2 pandemic caused by the SARS-CoV-2 virus may have an important contribution to these higher burnout values If we add to the daily difficulties that parents are already experiencing in caring for their children the existence of a pandemic, telecommuting that made many parents have their work and personal management difficult, this may be enough to observe a greater number of parents with burnout parental (Aguiar et al. 2021; Bastiaansen, 2021).

Although there are considerably more mothers in the sample, the results showed that they have higher parental burnout values than fathers, including higher values in all dimensions that make up parental burnout, however these values are not indicative of significant differences in parental burnout with regard to being a mother or a father. These results are similar to those found by Roskam et al. (2017), carried out with approximately 1723 French parents, the author concludes that there are no significant differences between men and women. However, in studies carried out more recently by Roskam et al. (2021), in which the authors sought to study the prevalence of parental burnout in men and women from 42 different countries, as well as to see if there are differences in the levels of parental burnout, depending on the culture in which the parents are inserted, the authors point to a higher incidence of parental burnout in women. This may be because there is still a strong normative expectation in society that it is a woman‘s role to be responsible for the care of her children.

However, in a validation study of Parental Burnout Assessment in a Dutch working population, applied to 627 parents, reports that more fathers had significant levels of parental burnout compared to the mothers present in the sample. These parents reported more emotional detachment from their children and lower levels of personal fulfilment. On the other hand, mothers reported higher levels of emotional exhaustion (Van Bakel, Van Engen & Peters, 2018).

As for the relationship between parental burnout and parents‘ age, this study indicates that there are some significant correlations between the concept of parental burnout and the age of the parents who agreed to participate in the study. In a longitudinal study with a sample of 17,000 individuals that sought to understand the role of culture in the development of parental burnout, the authors indicate that younger parents, both men and women, are particularly susceptible to parental burnout. These same parents are also more likely to develop emotional detachment (Sorkkila & Aunola, 2020). In another study conducted by Kawamoto et al. (2018), which sought to validate Parental Burnout Inventory for the Japanese population, the authors indicate that despite the age of the parents having a significant correlation with the levels of parental burnout, and this factor being understood as a risk factor for the development of parental burnout, sociodemographic variables such as age are not the best explanation of the variance in parental burnout.

With regard to the relationship between parental burnout and the age at which the participants became parents in the non-parametric tests used to assess a possible significant correlation between parental burnout and this sociodemographic variable, it was possible to establish correlations, albeit negative, with all dimensions of parental burnout and the age at which the parents who participated in the study were when they became parents for the first time.

In a study carried out in France with 372 French parents, the authors obtained results that indicate that there is no correlation between parental burnout and the parents‘ age when their first child was born. However, the second dimension of parental burnout, emotional detachment, was, although similar to this study, a weak correlation with the age at which parents had children for the first time. In the same way, being a father or mother for the first time is a risk factor, similarly to younger parents, for the development of emotional distance and loss of parental fulfilment. The authors of this study theorize that this may mean that certain periods of development make it more likely to develop certain experiences related to parenting (Vigoroux & Scola, 2018).

The results seem to indicate that there is, in fact, some correlation between parental burnout and family resilience. Statistical analysis points to weak negative correlations between the dimensions of these two concepts. The existing studies that seek to relate these two concepts were mostly carried out with samples of parents who have children with some type of pathology (diabetes, chronic diseases), and with samples that, like the one used in this study, were mostly composed of women, and with instruments different from those used (Aivalioti & Pezirkianidis, 2020, Sorkkila & Aunola, 2020). There is not much literature that relates or seeks to study these two concepts, at least directly. There are indeed some studies that seek to relate parental burnout with parental resilience, which is a variable of interest to understand our investigation (Sorkkila & Aunola, 2020). Similar to the conclusions of this study, the results obtained and reported in the literature indicate that these two concepts are related and that the presence of family resilience causes a reduction in parents' stress levels (Silva, Cunha & Ramos, 2021, Ungar, 2016).

In our results we can verify that there are weak negative correlations between the total scales and all subscales of the PBA and WFRQ. In a study carried out by Kavaliotis (2017), this author indicates that the dimensions and subscales of the instrument used to measure parental stress were well correlated with parental burnout, namely with the dimensions “family bonding” and “ability to use social and economic resources”. The author indicates that in his study there is a strong negative relationship between the subscales of the instrument used to measure parental stress and family resilience. This suggests that the greatest parental stress experienced is not related to parenting tasks, but to the lowest family resilience. In another study by Ilias, Cornish, Kummar, Park & Golden (2018) that sought to understand whether family resilience is a mediating variable of parental burnout and parental stress, the authors concluded, using a mediator model, that stress affects parental resilience, which in turn influences levels of family resilience. That is, the more stressful the event that is affecting the parents, the less the family's ability to mobilize the necessary resources to solve the stressor, that is, the lesser the family resilience.

Studies also indicate that parental resilience is a potential predictor of parental burnout. This means that resilient parents help their families to be more resilient during pressure, which is congruent with the questions created for this investigation, and which were confirmed through the linear regression that demonstrated that, in fact, family resilience explains a good part of parental burnout, namely 19.8%.

Conclusions

The main conclusions point out that: the age of the parents and the age at which they were mothers or fathers is related to the existence of higher levels of parental burnout; parental burnout and family resilience are negatively correlated, that is, the lower the family resilience, the higher the levels of parental burnout and vice versa. Family resilience appears to have a predictive effect on the levels of parental burnout demonstrated by the parents participating in the study, as can be seen by performing the linear regression.

With regard to the limitations found in this study: it is considered that one of the limitations of this investigation was the low representation of males in the sample used. This can cause difficulties in generalizing the results obtained for male subjects who are fewer in number than female participants.

It is also important to consider possible biases in the results, that is, the possibility of there being participants who responded to the questionnaires according to what would be socially desirable.

It is considered that it could be interesting to understand the influence that the covid-19 pandemic may have on the results obtained. By way of explanation, it would be interesting to see if parents report higher levels of parental burnout during the pandemic and if the pandemic itself has an influence on the levels of family resilience of fathers and mothers.

Although it was not a variable used in this study, it was noted that the type of family as well as the level of education are two sociodemographic variables that may be correlated with parental burnout. It would be interesting in another study to understand what kind of correlation exists between these two sociodemographic variables and parental burnout, in this study these two variables were used only to better describe the population that was being studied. It would also be interesting to study other variables, such as the existence or not of some kind of social and family support. It would also be interesting to use other types of instruments to measure family resilience, or even to study the relationship between parental burnout and other types of resilience that the literature identifies as relevant, such as, for example, parental resilience.

AUTHOR CONTRIBUTIONS

Conceptualization: MJB, GF, and JA; Methodology: MJB, GF and JA;
Formal Analysis: JA, MJB, and GF; Investigation: JA. MJB and GF;
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Inclusive education in Portugal

Characterization of the barriers/facilitators and methodologies

Adelinda Araújo Candeias[a], Gabriela Almeida[b], Adriana Simões Félix[c], António Portelada[d]

REVIEWED
Marcus Stueck
Sebastian Müller-Haug
Int. Biocentric Research Academy/IBRA

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Martina Goth

AFFILIATION
a Departamento de Ciências Médicas e da Saúde, Escola de Saúde e Desenvolvimento Humano, Universidade de Évora, Évora, Portugal. Comprehensive Health Research Centre (CHRC), Universidade de Évora, Évora, Portugal
Orcid: 0000-0002-9489-8880
b Departamento de Desporto e Saúde, Escola de Saúde e Desenvolvimento Humano,
Universidade de Évora, Évora, Portugal. Comprehensive Health Research Centre (CHRC), Universidade de Évora, Évora, Portugal
Orcid: 0000-0002-6716-2114
c Comprehensive Health Research Centre (CHRC), Universidade de Évora, Évora, Portugal
Orcid: 0009-0001-8377-214X
d Escola Superior de Educação de Santarém & Comprehensive Health Research Centre (CHRC), Universidade de Évora, Évora, Portugal
Orcid: 0000-0003-4499-9517

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CORRESPONDENCE
Adelinda Araújo Candeias
Departamento de Ciências Médicas e da Saúde, Escola de Saúde e Desenvolvimento Humano, Universidade de Évora
Largo dos Colegiais 2
Apartado 94
7002-554 Évora, Portugal
email address: aac@uevora.pt

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www.bionet-research.com
www.schibri.de

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ABSTRACT
The main goal of this study was to characterize the barriers, facilitators and methodologies of inclusion in Portugal. A total of 124 Portuguese participants (94.35 % females) were included in this study through their responses to a questionnaire (ASUMIE Survey – Portugal) which focused on questions related to barriers, facilitators, and methodologies concerning individuals with Special Educational Needs and their inclusion. The perceptions and experiences of the participants regarding barriers, strengths, and strategies were characterized and discussed, providing valuable insights into enhancing inclusive educational practices.
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KEYWORDS
inclusive intervention, inclusive education, barriers/facilitators to inclusion, methodologies to improve inclusion

Introduction

The education system in Portugal operates under the democratic principles outlined in the Constitution of the Republic (1976), emphasizing the freedom to teach and learn. The Basic Law of Education (1986) derives from these principles, defining educational objectives, structures, and models. The Ministry of Education (ME) is the key governmental agency responsible for shaping national education policies, from pre-school to out-of-school education. In higher education, the Ministry of Science, Technology, and Higher Education (MCTES) takes charge of defining policies related to science, technology, and vocational training. Additionally, vocational training and adult education are jointly governed by the Ministry of Education and the Ministry of Labour, Solidarity, and Social Security (Eurydice 2021/22).

Structure of the Education System

The Portuguese education system mandates compulsory schooling for 12 years, starting from the age of 6 and ending at 18 years. Public education is free and universal, available from age 4 to the completion of secondary education (Eurydice 2021/22).

Stages of the Education System

Pre-school Education (ISCED 0): Aimed at children aged 3 to 6, pre-school education is optional. However, it becomes universally available when a child turns four. The network of pre-school establishments has expanded in recent years, as part of a policy of broad availability (Eurydice 2021/22).
Basic Education (ISCED 1 and 2): Basic education is compulsory, lasting nine years and divided into three sequential cycles:
The first cycle (CITE 1) comprises the first four years of schooling (grades one to four).
The second cycle (CITE 1) covers the next two years (grades five and six).
The third cycle (CITE 2) includes the last three years, corresponding to lower secondary education (grades seven to nine). The curriculum emphasizes general training common to

all students, providing fundamental knowledge and skills for further studies.

Upper Secondary Education (ISCED 3): This phase includes the last three years of compulsory education (grades 10th to 12th) and offers various types of education. Students can pursue regular education, choosing between scientific-humanistic courses or vocational courses with dual certification (academic and professional). The system ensures permeability between different educational paths, allowing access to higher education through national exams (Eurydice 2021/22).

Post-Secondary Non-Higher Education (ISCED 4): Students over 18 years of age, having completed 12 years of compulsory education, can attend Technological Specialization (CET) courses. These courses provide highly qualified technical training oriented towards the workforce or higher education, typically lasting one year (Eurydice 2021/22).

Higher Education (ISCED 5–8): After completing 12 years of compulsory education, students can enter higher education at universities or polytechnics. Universities offer scientific training, combining teaching and research efforts. In contrast, polytechnics emphasize vocational training and advanced technical education. Higher education is structured in accordance with the principles of the Bologna Process, promoting both scientific and cultural preparation, as well as specialized training to develop students' innovation and critical analysis skills (Eurydice 2021/22).

The additional support system of inclusive education in Portugal over the years

In the past, there was a focus on treating and curing disabilities, which led to separating individuals with disabilities from society. However, a new perspective emerged which recognized the impact of societal barriers on creating disability. This approach is known as the social model. In more recent times, the biopsychosocial model has been developed, which combines both medical and social perspectives. This model considers the interaction between biological, psychological, and social factors when understanding disability (Anastasiou & Kauffman, 2011; Brisenden, 1986; Grosso, 2010; Oliver, 1990; Thomas, 2004).

Portugal's education system underwent significant changes, moving from a medical model to a biopsychosocial approach. The legislation required medical diagnosis for students with disabilities in the 1950s. However, over time, the focus shifted to promoting inclusive education, and the importance of social and environmental factors in disability became recognised (Bronfenbrenner, 1979; World Health Organization [WHO], 2004)

In 2018, Decree-Law nº 54 introduced inclusive education principles, emphasizing the importance of multidisciplinary support teams, reference schools, and universal design for learning. The goal is to provide personalized assistance to all students, embracing their diversity and promoting successful educational experiences (Pereira et al., 2018). In order to support these students, the Multidisciplinary Support Teams for Inclusive Education (EMAEI) were created as a specific organizational resource, aiming to support the integrated and participatory learning of all those involved in the educational process. The Multidisciplinary Team for Inclusive Education (EMAEI) consists of several key members who play vital roles in supporting inclusive learning. These members include a representative from the school's management team, the special education coordinator, coordinators responsible for each educational level or cycle, professionals from technical-pedagogical services like psychologists, speech therapists, and other specialists, as well as representatives from families and the community, whenever their input is pertinent. Together, they work collaboratively to ensure a comprehensive and participatory approach to the educational process, fostering an inclusive environment for all learners.

The shift in perspective reflects a broader understanding of disability, emphasizing the importance of inclusive measures that address societal barriers and support the needs of all learners.

Barriers and Facilitators

Portuguese legislation has gradually brought children with diverse needs to schools, moving from a medical to a biopsychosocial model of assessment. Key milestones include legislation after April 25, 1974, the Law of Bases of the Educational System in 1986, and Decree-Law No. 319/91, which aimed to integrate children with special educational needs into schools. The recent paradigm of inclusive education reflects a confluence of systemic and biopsychosocial models, necessitating changes in values, attitudes, and practices.

However, the impact of these changes is still being studied. Coelho (2020) suggests reinforcing training in inclusive education, promoting teamwork between teachers and specialists, and stimulating training on attitudes and values. Additionally, there's a need to develop assessment instruments for educational values and increase community involvement in promoting inclusion.

As highlighted in the OECD report (2022), Portugal has a comprehensive structure for inclusive education but faces challenges. There is a need to strengthen collaboration among stakeholders, clarify responsibilities for inclusive education administration, and improve the management of resources. Initial teacher education should better prepare teachers for diversity, equity, and inclusion. While various structures offer continuous professional learning, they need to be more practical and not overly burden teachers.

Although there is widespread awareness and acceptance of inclusive policies, implementation varies at the school and local levels. Resource use tends to promote separate arrangements for students, even in mainstream schools with significant resources for inclusion. The cluster system provides possibilities for school-to-school support, but collaboration across the education system is limited. Monitoring and evaluating equity and inclusion in education requires a coherent strategy, as current efforts lack coherence.

In the context of an inclusive school, we have sought, over the last four years, to inventory and characterize barriers, facilitators and methodologies of inclusion, with various professionals, parents and family members who intervene in the inclusive school.

Methods – Participants

A total of 124 Portuguese participants (117 females and 7 males) were enrolled in this study by responding to the questionnaire. Regarding the age of the participants, the most frequent age

range was 40–50 years old (n = 50, 40.32 %), followed by 30–40 years old with 36 participants (29.03 %), 50–60 years old with 22 participants (17.74 %), 20–30 years old with 10 participants (8,06 %), and six (4.84 %) were more than 60 years old.
The majority of the participants hold a bachelor's degree (n = 80; 64.52 %), 36 (29.03 %) have a master's degree, seven (5.65 %) have a PhD degree, and only one (0.81 %) has a high school diploma.
Looking at the circumstances/official positions in which participants provided responses, the majority are teachers (n = 84, 67.75 %), 12 (9.68 %) are support teachers, 6 (4.84 %) are parents, two (1.61 %) are psychologists, another two (1.61 %) are headmasters, and two more are experts (1.61 %). One participant (0.81 %) is an educational support assistant, another one (0.81 %) is a physician, and yet another one is a therapist (0.81 %). Thirteen participants hold more than one official position: five are teachers and parents (4.03 %), two (1.61 %) are teachers and pedagogical counselors, one (0.81 %) is a teacher and a support teacher, one (0.81 %) is a support teacher and an expert, one (0.81 %) is a support teacher and a parent, one (0.81 %) is a support teacher, parent, and therapist, one (0.81 %) is a parent and a psychologist, and another one (0.81 %) is a teacher, pedagogical counselor, and expert.
In relation to the age range of students with whom the participants work or their children, in the case of parents' responses, 46 (37.10 %) work with preschool-aged students, 28 (22.58 %) with primary school students, and another 28 (22.58 %) with middle and high school students. Eight (6.45 %) of the participants work with students from primary to secondary school age, and 4 (3.23 %) work with university-aged students. Ten participants work with more than one age range of students: four (3.23 %) work with preschool and primary school students, three (2.42 %) work with preschool, primary, and secondary school students, one (0.81 %) works with preschool and secondary school students, one (0.81 %) works with preschool and university students, and another one (0.81 %) works with secondary school and university students.
Examining the affiliation group, the majority (n = 99, 79.84 %) of the participants belong to a school, five (4.03 %) are associated with family and family associations, and another five (4.03 %) are higher education teachers or researchers. Additionally, two (1.61 %) participants are affiliated with rehabilitation centers, another two (1.61 %) with special education service centers, two (1.61 %) with school counseling centers, and two (1.61 %) are experts.Ttwo (1.61 %) participants responded with „I can't answer." Five participants have multiple affiliation groups: two (1.61 %) participants are affiliated with both schools and family associations, one (0.81 %) is affiliated with schools and is a professor/investigator, one (0.81 %) is affiliated with schools and a special education service center, and another one (0.81 %) is affiliated with schools, a special education service center, and experts.

Instrument

The ASUMIE Survey was developed as part of the European research project ASUMIE, which involves 7 European countries (https://asumie.eu/). It was designed to provide further insights into the type of assistance and support provided to students with Special Educational Needs (SEN), educational methodologies, and strategies to enhance the quality of life for students with SEN and their families, both within and outside the school setting. The construction of the questionnaire occurs inside the project ASUMIE, involving representantes from all the partners countries, in onçine meetings. Previously, each partner elaborated a list of topics, then in one online meeting, all the topics were transformed into questions, the format of question and answer were discussed and decided by consensus. The first draft of the questionnaire was translated to each partner country language and tested with a small group of professionals and parents. After this process the English version was revised and each partner country version also was revised. The final version of the questionnaire included one open-ended question and 34 closed-ended questions, although some allowed for more than one response. In this study, we have exclusively focused on the analysis of three specific questions pertaining to barriers, strengths, and strategies: Which are inclusion's social and school barriers?; Which are inclusion's social and school facilitators? What kind of methodologies are used in schools in order to offer adequate support for SEN students? Additionally, the survey aimed to gather information for the characterization of the sample, including gender, age, academic qualifications, circumstances/situations in which participants provided responses and affiliations. An electronic version of this tool was prepared according to the guidelines proposed by Eysenbach (2012).

Procedures

The ASUMIE Survey Portugal was developed as part of the ERASMUS+ – KA2 project (Project 2020-1-BE02-KA201-074751; https://asumie.eu/) and was designed to be administered online through Google Forms.The first page of the questionnaire included an informed consent statement. The responses were stored confidentially in a secure electronic database. The questionnaire was open for 3 months and only allowed one response per participant. It was promoted on social media, mailing lists, education-related websites and forums, as well as through emails sent to schools and universities.

Data analysis

The participants' responses were exported from Google Forms to Microsoft Excel Office, where descriptive statistics, including absolute frequency and percentage, were calculated.

Results and Discussion

The results of the analysis for the three key questions on barriers and facilitators, and methodologies are presented in Table 1 and Table 2, respectively.
The data about barriers to inclusive education has points out gaps that exist within the system. Several key findings stand out, with percentages superior to 50 %, highlighting critical areas that need attention and improvement.
Not Appropriated or Structured Spaces: With 61.3 % of respondents acknowledging issues related to physical barriers

and unsuitable environments, it is evident that creating accessible and inclusive spaces is crucial. Schools must ensure that their infrastructure accommodates the needs of all learners, including those with mobility challenges or sensory sensitivities.
Lack of Aid and Communication Support: Similarly, 61.3 % of respondents identifying a lack of assistance and communication support underscores the importance of providing adequate resources to aid students with diverse learning needs. Effective communication tools and support strategies are essential to fostering an inclusive learning environment.
Not Enough Number of Support Hours: A significant 66.9 % of respondents expressing concerns about inadequate support hours highlights a major issue in inclusive education. Sufficient support time is essential for providing personalized assistance and ensuring that students with special needs can fully participate in classroom activities.
Lack of Specialists at School: The data showing 46.8 % of respondents identifying the absence of specialized professionals within the school environment signals a critical deficiency. Schools need to invest in specialized personnel, such as psychologists, speech therapists, and other experts, to better address the diverse needs of their students.
These findings demonstrate that there is still much work to be done to achieve a fully inclusive education system. Addressing

Table 1 Characterizations of the barriers and facilitators identified by the participants

Barriers	**N (%)**
Not appropriated or structured spaces (i.e. mobility barriers, noisy environments…)	76 (61,3%)
Lack of aid and of communication support	76 (61,3%)
Lack of technology instruments	39 (31,5%)
Lack of relationship with peers and support figures	17 (13,7%)
Lack of teachers' teamwork	31 (25%)
Lack of specialization of support teacher	27 (21,8%)
Not appropriate individual objectives	18 (14,5%)
Not enough number of support hours	83 (66,9%)
Lack of teacher knowledge (i.e. they lack experience with particular SEN)	42 (33,9%)
Lack of specialists at school	58 (46,8%)
Lack of relevant information to public	15 (12,1%)
Stereotypes and prejudice in the society	30 (24,2%)
Lack of state support for counseling centers and schools	25 (20,2%)
I am not able to answer (only for families)	5 (4%)
Facilitators	
Creating a welcoming environment	100 (80,6%)
Using a figurative communication	22 (17,7%)
Using a specific software	19 (15,3%)
Supporting the relationship with peers	77 (62,1%)
Teachers' teamwork	90 (72,6%)
Having an appropriate individual program	58 (46,8%)
Having enough support hours	28 (22,6%)
Supporting inclusion during free time	38 (30,6%)
Having an appropriate evaluation and monitoring system	28 (22,6%)
Successful case studies represented in the media	4 (3,2%)
Ambassadors of specific target groups (famous persons representing specific area)	2 (1,6%)
Practical and efficient prevention and/ or intervention programs implemented at schools	39 (31,5%)
I am not able to answer (only for families)	7 (5,6%)

Table 2 Characterizations of the methodologies used by the participants

Kind of methodologies	**N (%)**
Peer education	42 (33,9%)
Specialized – support teacher	107 (86,3%)
Specialized – support teacher	10 (8,1%)
Tutoring	40 (32,3%)
Mentoring	11 (8,9%)
Cooperative learning	48 (38,7%)
Metacognitive strategies	12 (9,7%)
Personalized didactics	19 (15,3%)
Paths/individualized education program	83 (66,9%)
Use of resources outside of the school (shops, gyms, pools, libraries, farms and more for personal autonomy)	32 (25,8%)
Check lists (i.e. ICF by WHO)	13 (10,5%)
Specific tools for evaluation	40 (32,3%)
Adjustment for admittance to exams	49 (39,5%)
Adjustment of content and outcomes of education	85 (68,5%)
Special teaching aids, special equipment (i.e. materials for learning)	50 (40,3%)
Volunteers (network from school or parents)	1 (0,8%)
Internship (students)	3 (2,4%)
Educational technology	21 (16,9%)
Socio-emotional education	11 (8,9%)
Flipped classroom	3 (2,4%)
Lesson classroom	10 (8,1%)
Expressive activities (i.e. theater, music, arts)	24 (19,4%)
Cognitive strategies (i.e. problem solving, decision making …)	22 (17,7%)
Behavioral strategies (i.e. prompt, task analysis, token economy …)	15 (12,1%)
Teaching assistant or educator	35 (28,2%)
I can't answer	8 (6,5%)

these challenges requires a multi-faceted approach involving various stakeholders, including educators, administrators, policymakers, and the broader community.

The data about facilitators for inclusive education reveals several significant factors that contribute to fostering an inclusive and supportive learning environment. Certain aspects stand out, with percentages superior to 50 %, indicating their high importance in promoting inclusion in educational settings.

1. Creating a Welcoming Environment (80.6 %): The overwhelming majority of respondents (80.6 %) recognize the critical role of a welcoming environment in inclusive education. A warm and inclusive atmosphere helps students feel accepted, valued, and encouraged to participate fully in all aspects of school life. Schools and educators should prioritize creating an environment where diversity is celebrated, and every student feels safe and respected.
2. Supporting the Relationship with Peers (62.1 %): Over 60 % of respondents emphasized the significance of supporting positive peer relationships. Encouraging interactions and social connections among students of all abilities fosters a sense of belonging and reduces social isolation for students with disabilities. Teachers and schools can play a pivotal role in facilitating inclusive social activities and collaborative projects that bring students together.
3. Teachers' Teamwork (72.6 %): A substantial percentage of respondents (72.6 %) identified the importance of teachers' teamwork in promoting inclusive education. Collaboration among teachers allows for the exchange of ideas, strategies, and experiences, enabling them to better address the diverse learning needs of their students. Teamwork also enhances professional growth and empowers educators to implement more effective teaching practices.
4. Having an Appropriate Individual Program (46.8 %): Nearly half of the respondents (46.8 %) highlighted the significance of personalized individual programs for students with special needs. Tailoring educational plans to meet each student's unique requirements is essential for their academic and personal development. Individualized programs help address specific learning challenges and provide the necessary support to help students thrive in their academic journey.
5. Practical and Efficient Prevention and/or Intervention Programs Implemented at Schools (31.5 %): While not surpassing 50 %, the percentage of respondents (31.5 %) recognizing the importance of practical and efficient prevention and intervention programs is noteworthy. Schools should implement evidence-based programs that identify learning difficulties and provide timely interventions to address them. Early intervention can significantly improve outcomes for students with diverse needs.

Although other factors did not surpass the 50 % threshold, they still hold value in promoting inclusive education. Utilizing figurative communication and specific software can enhance accessibility for students with communication challenges and diverse learning styles. Providing enough support hours and supporting inclusion during free time can create a more inclusive learning experience.

Addressing the challenges identified by the study requires a comprehensive approach that involves collaboration among educators, administrators, families, and the broader community. Teacher training programs should focus on inclusive teaching methodologies, and schools must invest in resources and infrastructure to support inclusive practices effectively. Furthermore, the promotion of successful case studies through media representation and the involvement of ambassadors from specific target groups can help raise awareness and advocacy for inclusive education.

The data on the methodologies used by the participants shows various approaches employed in supporting inclusive education. Several key methodologies stand out, with results superior to 50 %, indicating their prevalence and significance in inclusive educational settings.

1. Specialized – Support Teacher (86.3 %): The highest percentage of respondents (86.3 %) reported the importance of specialized support teachers. These professionals play a crucial role in providing personalized assistance and support to students with diverse learning needs. Their expertise and training enable them to design individualized education plans and implement tailored interventions to cater to each student's unique requirements.
2. Paths/Individualized Education Program (66.9 %): Over two-thirds of the participants (66.9 %) indicated the adoption of individualized education programs (IEP's) or paths. These personalized plans outline specific learning goals and strategies for students with special needs, considering their strengths, challenges, and preferences. Individualized education programs ensure that students receive targeted support and resources to maximize their learning outcomes.
3. Adjustment of Content and Outcomes of Education (68.5 %): With 68.5 % of respondents highlighting the adjustment of content and outcomes of education, it is evident that educators recognize the importance of adapting the curriculum to meet the needs of all learners. Modifying instructional materials, assessments, and learning objectives ensures that students with diverse abilities can actively engage in the learning process and achieve success.
4. Cooperative Learning (38.7 %): Cooperative learning was reported by 38.7 % of the participants as a methodology used in inclusive education. This approach encourages collaborative group activities, allowing students with varying abilities to work together, learn from each other, and develop essential social skills.
5. Adjustment for Admittance to Exams (39.5 %): The data shows that 39.5 % of the respondents make adjustments for students with special needs during examinations. These adjustments may include extra time, modified formats, or other accommodations to ensure a fair and accessible assessment process.

Additionally, other methodologies, such as peer education, tutoring, personalized didactics, and the use of resources outside of the school, also contribute to supporting inclusive education, although to a lesser extent.

It is worth noting that some methodologies received lower percentages, such as volunteers (0.8 %) and flipped classrooms (2.4 %), indicating that these approaches may not be as prevalent in the participants' educational settings.

Overall, the data demonstrate that a combination of methodologies is employed in inclusive education to cater to the diverse needs of students. The emphasis on specialized support teachers, individualized education programs, and adjustments in content and outcomes reflects the commitment of educators and schools to providing personalized and inclusive learning experiences.

Conclusions

The findings from this study shed light on the barriers, facilitators, and methodologies that play significant roles in improving inclusive education. The data underscores that political decision and legislation is not enough but promotes the conditions to improve the crucial steps that education systems can take to create a more inclusive and equitable learning environment for all students.

Based on the data collected in this study we could confirm that to improve inclusive education, politics and educational leaders in Portugal, should consider the improvement of the following key actions:

Teacher Training: Comprehensive training and professional development for teachers in inclusive teaching methodologies and understanding diverse learning needs are vital. Equipping educators with the necessary knowledge and skills empowers them to cater to the unique requirements of all students effectively.

Infrastructure and Resources: Investing in accessible physical environments and providing adequate resources, such as assistive technology and communication aids, are fundamental for fostering an inclusive learning environment. Ensuring that all students have equal access to education is essential for their academic success and well-being.

Collaboration and Support: Encouraging collaboration among teachers, support staff, families, and specialists is critical for the success of inclusive education. Working together as a team enables a holistic approach to meet students' needs and provides a strong support system for both educators and learners.

Awareness and Advocacy: Raising awareness about the importance of inclusive education and combatting societal stereotypes and prejudices are essential steps in fostering a more inclusive and accepting society. Promoting understanding and acceptance of diverse abilities contributes to an inclusive culture within the educational community and beyond.

Government Support: Prioritizing funding for counseling centers and schools is essential for implementing effective inclusive education. Governments play a vital role in providing the necessary resources and support to ensure that all students can access quality education and support services.

In conclusion, the data highlights the critical role of various factors in promoting inclusive education, since the inclusive model of education was implemented in Portugal through the Decree-Law nº 54/2018. By addressing the identified barriers, investing in facilitators, and adopting evidence-based methodologies, Portuguese education systems is in the good way to create a more inclusive, equitable, and supportive learning environment for every student and accomplish the Convention on the Rights of Persons with Disabilities, that Portugal subscribed to in 2006.

To close, we could point out that by embracing the principles of inclusive education, we can empower all learners to reach their full potential, regardless of their unique abilities and needs. Continuous efforts in professional development and collaboration among stakeholders will contribute to the ongoing improvement and success of inclusive educational practices.

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Mental health for children and their companions from the perspective of the Relative Biocentric Health Theory

Marcus Stueck

REVIEWED
Marcus Stueck
Sebastian Müller-Haug
Int. Biocentric Research Academy/IBRA

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EDITED
Martina Goth

AFFILIATION
Int. Biocentric Research Academy/IBRA
Orcid: 0000-0003-0208-0772

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CORRESPONDENCE
Prof. Dr. habil. Marcus Stueck
International Biocentric Research Academy in Leipzig
Leipziger Str. 64, 04420 Markranstedt

Open access Journal, Download:
www.bionet-research.com
www.schibri.de

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ABSTRACT

This article addresses the fundamentals of mental and physical health in children. A new health theory is used as a framework. This relative biocentric theory of health was developed by Stueck (2023). In it, there are 5 guiding concepts that are central to health: Connection, Intensity, Flow, Consciousness (Awareness), and the fact that health has a source. These 5 guiding concepts are discussed in relation to children and adolescents.

KEYWORDS

Biocentric health, relative biocentric health theory, biocentric growth and development

1 Introduction

This field of health is very important, because mental disorders in children and their accompanying persons have increased in an alarming way. The most common are stress, and exhaustion states and related illnesses (including depression, addictions, psychosomatic illnesses).
Crises and unstable social conditions have also increased and represent risk factors and challenges for mental health.
Children are like seismographs who naturally perceive the changes in social conditions or their environment, e.g. nature (macrosystem), in the institution daycare/school (mesosystem), in their families (microsystem) and in themselves (individual system) and are not always able to process them adequately. They need support and are dependent on their companions being healthy themselves. Unfortunately, this is not the case. According to a study by Schaarschmidt (2010), 60 percent of teachers exhibit problematic stress processing consequences (type BurnOut, type sparing, type A). The tendency is increasing.
The field of work described here is not only to enable them and their companions, but also to stimulate sustainable psychological growth, so that children and their companions or families, despite the challenges of a time that is not easy, can live contentedly and happily, in connection with themselves, with others and with the ways of life or the laws of nature.

2 Features and guiding concepts of mental-mental health

Mental-mental health in children and adults has a core, a source. What is the source of mental-emotional health? It is the experience of moments of harmony and the feeling of being alive at the spiritual, physical and psychological levels. This harmony is triggered by the way a person thinks, the way they feel and the way they act. When this harmony and thus the connection to the source of health, the feeling of being alive, is disturbed, then illness arises. This is true for individuals, for small groups (microsystems, families), for teams in institutions and for societies and larger organizations.
The mental health of children always includes the work with the accompanying persons (family microsystem), the institution in which the child lives and learns (mesosystem) and the social conditions (macrosystem). If these system elements of mental health do

not co-evolve in a healthy way, this will also have an impact on mental health in children. Krenz (2006) described this as „... you can only take a child as far as you have taken yourself."
It can be said that due to the way of life of man, whereby the so-called western lifestyle, depletes the natural resources and also man himself, the contact to nature and to a healthy way of life close to nature has been lost. Signs of this are climate change with the countless man-made natural disasters. Restoring a healthy way of life close to nature is the basis for the necessary development of mental and emotional health in children and their companions. Knowledge about this should be imparted from an early age, as well as an ethic of living together, as a prerequisite for mental-emotional health.
What is a nature-based healthy lifestyle for achieving and maintaining mental-emotional health in children and their companions? It must have characteristics that can be found in nature and can be transferred to human beings and their mental-emotional health. This also applies to physical health, because both the mind and the body belong together according to the principle of duality. The same applies to the social, because illness is always a relationship problem of man to himself, to others and to nature. In the development of mental-emotional health, it is true that it takes a whole village to raise a child. Fig. 1 names elements and guiding concepts that it takes to restore or maintain and nurture a nature-based healthy lifestyle to achieve and sustain mental-emotional health in children and their companions. They are based on the Relative Biocentric Health Theory (Stueck, 2023).

Fig. 1 Leitbegriffe und Elemente psychischer Gesundheit (Stueck, 2023)

Structur = Connection (Field 1, Chapter 2.1)		Organisation = Intensity (Field 3, Chapter 2.3)
	Source = Harmony	
Process = Fluidity (Field 2, Chapter 2.2)		Borders = Awareness (Field 4, Chapter 2.4)

These elements will be explained in the following.

2.1 Structure of mental-emotional health = guiding concept: connection

Nature is not something outside of man. It begins in the human being itself (inner natural space) and in the relationship with others and the life forms of nature. The development of mental health depends on the following 4 levels of relationship:

- Taking care and caring and self-responsibility for one's own inner natural space:
  This means through healthy intestinal health (nutrition, check up), health of internal organs (nutrition, exercise, check up), functioning autoregulation (exercise, relaxation, check up), balance between inner and outer orientation (reflective capacity and emotion regulation check up).
  The idea behind this is, on the one hand, that if the body is not well, then the psyche is not well either. On the other hand, the physical and psychological processes must be well reflected (mindfulness) in order to remain psychologically healthy.
  This can be developed in a child-friendly way, e.g. with yoga and meditation for children and their accompanying persons (family yoga). ,
- Develop care and caring and self-responsibility for relationships with others:
  Mental-emotional health is first and foremost the ability to form attachments and relationships. Through relationships, the child learns about itself, its strengths and also its weaknesses. It learns to ask for support. It remains healthy by learning, at a certain age, to keep toxic relationships out of its life and to communicate its own genuine feelings and needs. For the educator, there is a need to review his attitude by asking not „what is wrong with you?" but „how can I support you?" and to pass this attitude on to parents as well.
  For this, for example, learning verbal and non-verbal empathy and communication (among others, Appreciative Communication, Biodanza for Children, Empathy School) is beneficial. This can train the affective relationship skills in children and his companions.
  The idea behind this is that if other people are not well, then this also has an impact on my own health.
- To take care and self responsibility for the external natural space:
  This means taking responsibility for other life forms that surround us, such as animals and plants. This also includes behaviors that protect the climate.
  The idea behind this is that, for example, the mindfulness given to things in daily life has an impact on experiencing inner balance and contentment and taking responsibility for one's own mental-emotional health. One example is animal-assisted pedagogy. Working with animals in daycare centers and schools shows how children come into balance and learn many useful things for their lives.
- Taking care of and caring for the connection of the rhythms of the inner natural space with the rhythms of the outer natural space:
  This is necessary for mental health, so that children and their companions can live their own rhythms in connection with the natural rhythms of the environment (nature).
  For example, the promotion of healthy sleep is necessary, in the observance of chronobiological rhythms (morning-evening type). Rituals for getting to know the rhythms of nature and natural elements are also part of this (e.g. rituals for the seasons, rituals of fire, earth, air and water).
  The idea behind this is that children learn from an early age to live in harmony with their own and nature's myths.

2.2 Process of psychic-mental health = guiding concept flowing

For the process of psychic-mental health, i.e. the nature-immanent dynamics of inner and outer life processes in relation to the psychically healthy process, flow is of great importance. Bringing things into flow is the opposite of rigid fixed protective patterns and behaviors that are often compensation for problematic feelings, such as fears. To dissolve fixations requires the following steps:

- Developing free thinking and honesty in the search for one's own truth e.g., initiating and expressing a thinking process without having to wear masks (e.g., Philosophizing with Children, Discovery Learning, 4k Skills: Creativity, Critical Thinking, Collaboration, Communication, Muuß-Merholz, 2023).
- Getting to know and trying out different patterns of perception of one and the same situation (e.g. experiencing, observing, evaluating, critically reflecting)
- Getting to know and accepting the dual parts of a thing (e.g. pain and joy)
- Developing trust in the deeper meaning of life, e.g. by developing a sense of coherence, i.e. that the world is perceived as understandable and manageable.

These aspects can be implemented in everyday life through awareness, reflection together with others.

2.3 Organization of mental-emotional health = guiding concept of intensity.

The organization of mental health is the production of intensity, e.g. by developmental leaps. The opposite of intensity would be, for example, manifestations of depression (stagnation, fixation). How to increase intensity of mental events:

- Learning to allow and endure instabilities and crises.
- Learning to move out of one's own comfort zones
- Becoming aware of one's own leaps in development
- Learning to stabilize oneself

2.4 Limits of mental-mental health = guiding concept of awareness.

For mental-emotional health, it is important to be aware of the boundaries that hinder mental health. What specifically is meant by this?

- Awareness of own fears and needs
- Awareness of own stress and exhaustion signals, e.g. work with stress reduction for children and parents
- Awareness of affective pathologies, e.g. discrimination, devaluation of others.
- Awareness of emotional dependencies, e.g. cell phones

2.5 Source of mental-emotional health = guiding concept of harmony.

The source, the core, of mental health is experiencing harmony in the moment.

The moment is the only place where life and the love associated with it exists. The moment is the place where ethical awareness arises about what is good for me and what is not, what is good for others and what is not, and what is good for nature and what is not. And that experience fundamentally changes everything. The problem with mental illness is above all the fact that the illness was triggered, among other things, by people living in the past and the future, worried about losing control and thus losing contact with its source, the moment with all its creativity. In the moment, structure, process, organization, boundaries of life are superimposed, that is, everything that constitutes mental health.

For mental health it is important to consciously experience moments, their inherent harmony. In doing so, movements must be decelerated in order to

- to experience living out, to be alive in the moment, for example by observing nature, animal-assisted pedagogy
- to experience the living out of creativity in the moment, for example through poetry, biodanza, making music
- to experience the living out of loving sensitivity in the moment, e.g. through massages
- experiencing aesthetics (natural beauty and harmony) in the moment, for example through art and painting.

When this happens, the person, big or small, perceives a force that is very important for mental health: the feeling of being alive. One perceives life, which is inseparable from love for oneself, for others and for nature.

Accesses to the source are the creative unfoldings of life in music, dance, poetry and access to physical-mental well-being.

3 age-specific psychological-mental health needs.

These characteristics of psychological-mental health (source, process, structure, organization, limits) which can be found in nature and which have been transferred to the human being or the child and its psychological-mental health, should also be found in different ways in the phases of being a child. Thereby a division is made into:

- basal (approx. 0–3 years),
- elementary (approx. 3–6 years)
- primary (approx. 6–10 years),
- heteronomous-expansive (approx. 10–14 years),
- autonomous-expansive educational processes (14–18 years).

3.1 Specific Mental Health Needs in the Elementary Phase: Years 3–6

What do children need most to feel good mentally, especially in years 3–6?

- Because they need touch and sensory experiences.
- They want to play and have present companions around them.
- They need secure attachments and a safe nest.
- They need the elements of nature fire, water, earth, air, rhythms, etc.

3.2 Specific Mental Health Needs in the Primary Phase: 6–10 Years of Age

Older children need above all for their mental health, besides the aspects that continue to be necessary:

- That they can recognize and live out their talent, their destiny.
- That they can develop a free thinking, own truth.
- That they can get to know themselves.
- That they can find their own orientation.

4 Necessary conditions for mental-mental health

For the mental-emotional health of children, special attention must be paid to the health of his environment (caregivers, institutional and social conditions). Here, likewise, the source of harmony, the process, the structure, the organizational features of mental-emotional health must be pronounced.
Now there are 4 pillars of mental-mental health, which are very important for children:
- Social conditions for mental-mental health and awareness about it (educational policy).
- Institutional conditions for the implementation of the above mentioned characteristics of mental-mental health, e.g. school without grades (Nölte, Wampfler, 2023)
- Family assistance (family as a support system)
- the child in its self-responsibility (above mentioned aspects)

5 conclusion

If you remember the following statements from experienced educators, then as an educator, teacher, or parent, you understand how important your own development is in the development of children's mental health:
- "You can only take children as far as you have come" (Krenz, 2009).
- "Pedagogy is love and example and nothing else" (Pestalozzi, cited in Stueck, 2010).

The learning of the child in this field of action "mental-emotional health", should always be linked to their own development. Therefore, in addition to the work with children on the development of mental health, offers are always important, such as reflection groups for educators, for parents (parent academy). The development of children's mental health means daily work on the health characteristics of connection, flow, intensity and awareness.

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30 years of research and intervention in human development

Remembering the work of Prof. Dr. Evelyn Witruk (1949–2023)

Konrad Reschke und Marcus Stueck

Prof. Dr. Evelin Witruk
(1949–2023)

Prof. Dr. Evevlin Witruk was born on November 13, 1949 in Leipzig. She spent her childhood and youth in Leipzig and studied psychology with Manfred Vorwerg in Jena. Her recognition today is based on the fact that she also established contact with the University of Evora through her international work as part of the EU's Erasmus program. As part of these initiatives, in 2017 she also contributed to the fact that a "Scientific meeting" of the Psychological Institutes of the University of Leipzig and the University of Evora has been running for six years now. In 2023, the VIth Leipzig-Evora-Zwickau Scientific Meeting in Psychology and Health Sciences will take place under the theme "New Horizons, New Paradigms in Health and Human Development" (University of Applied Sciences, Zwickau, Germany, 19th and 20th October, 2023). We honor her work at the University of Leipzig and would like to cite some of her works, aspects of her actions and related thoughts about Prof. E. Witruk.

REVIEW

From 1973 to 1976 she was a research student and from 1976 to 1984 Prof. E. Witruk was an employee of the Chair of Educational Psychology under the direction of Prof. Günther Clauss. She played a major role in the development of differential learning psychology, but decided to move to the University of Halle, where she received a lectureship in 1985. However, she was interested not only in the development of educational psychology, but also in rehabilitation psychology. She took an opportunity to apply her knowledge in practice. From 1984 to 1989 she also worked in the Saxon Specialist Hospital for Neu-

Die Universität Leipzig trauert um

Prof. Dr. Evelin Witruk

* 13. November 1949 † 2. April 2023

Ihr akademischer Werdegang und ihr Wirken als Professorin für Pädagogische Psychologie waren mit unserer Universität seit 1973 eng verbunden. 1993 übernahm sie die Arbeitsgruppe Pädagogische und Rehabilitationspsychologie und führte die Leipziger Tradition auf diesem Forschungsgebiet erfolgreich fort. Mit viel Herzblut begeisterte sie mehrere Generationen von Studierenden für ihr Fach. Besonders hervorzuheben ist ihr unermüdlicher Einsatz für die Internationalisierung, unvergessen ihr Engagement in der Krisenintervention vor Ort nach dem Tsunami in Südostasien 2004. Als Institutsdirektorin und Studiendekanin der damaligen Fakultät für Biowissenschaften, Pharmazie und Psychologie leistete sie zudem wichtige Beiträge in der Akademischen Selbstverwaltung.

Ihrer Familie und allen, die sie kannten und wertschätzten, gilt unser tief empfundenes Mitgefühl für den schmerzlichen Verlust, den sie erlitten haben.

Wir werden ihr stets ein ehrendes Andenken bewahren.

Prof. Dr. Eva Inés Obergfell	Prof. Dr. Marc Schönwiesner
Rektorin	Dekan der Fakultät für Lebenswissenschaften

Obituary from the University of Leipzig on the death of Prof. Witruk in the Leipziger Volkszeitung rology and Psychiatry in Altzscherbitz near Leipzig. There she gained recognition as a psychotherapist and also discovered the importance of painting and art therapy in the rehabilitation of mental disorders, e. g. B. in the event of partial performance disruptions. In 1993 she was appointed professor of educational and rehabilitation psychology at the Psychological Institute of the University of Leipzig, where she worked until her retirement in 2014. This means she has a long, intermittent period of work at the University of Leipzig. She continued the long tradition of educational psychology and combined it with rehabilitation psychology. She achieved many research results and worked in many modern areas of activity and research. She worked as director and dean of studies at the Psychological Institute and inspired several generations of students for psychology and the field of learning and educational psychology that she represented. Since her appointment at the University of Leipzig, she has been committed to the internationalization of studies. In particular, as ERASMUS representative of the Psychological Institute, she worked tirelessly to ensure that ERASMUS contracts were concluded between institutions in different countries and the Leipzig Institute of Psychology. On this basis, students and employees were able to go on guest study stays. These activities also provided the basis for the development of close cooperation with conferences and book publications between the universities of Leipzig and Evora in Portugal. In 2022 she still actively participated in conferences and trips. She planned a longer teaching stay in Yogyakarta (Indonesia). Due to a sudden, unexpectedly serious illness that began in 2022, we lost our colleague, supervisor and university lecturer Evelin Witruk on April 2, 2023. Prof. Evelin Witruk will be fondly remembered by her many domestic and foreign doctoral students, colleagues from home and abroad and students.

YOUR LIFE'S WORK

Educational psychology and rehabilitation psychology were her areas of vocation at the University of Leipzig. But Prof. Witruk not only continued the tradition of the well-known educational psychology in Leipzig, but she also significantly expanded its subject areas. She was particularly interested in the connection between educational psychology and the fields of cognitive psychology, clinical psychology and rehabilitation psychology. She also used innovative new research methods, for example eye movement analysis.

After a fact-finding mission after the tsunami catastrophe, in which she recognized the situation of psychology in Indonesia and Sri Lanka, Prof. Witruk increasingly accepted doctoral students from these countries, who, under her guidance, were supported by the Academic Exchange Service were able to do a doctorate on important topics in their own countries. Prof. Witruk looked after her students and doctoral candidates with passion. She was a doctoral mother hungry for knowledge, with a lot of understanding and many ideas for promoting young scientists. Many of the people she supports are now active in teaching and research and are continuing their work in Germany, Sri Lanka, Indonesia, Morocco, Sudan or South Korea. Particular emphasis should also be placed on her activities regarding research into learning difficulties; here she also focused on reading disorders (Dyslexia, Novita et. al 2019) and enriched her investigations with cognitive-memory psychological research approaches.

Since her experiences from the tsunami trips in 2005, she has also developed research interests in the area of processing the effects of trauma and has supervised several international doctoral theses (e.g. Witruk, Reschke & Stück, 2009).

In the interventional-rehabilitative area, Prof. Witruk was interested in painting therapy, in educational-psychological help after catastrophes and showed a great openness to the scientific investigation of new dance therapies (Biodanza).

She organized conferences (Daslexia and Traumatic Experiences; Leipzig-Evora Scientific Meetings) and published a book series with ten books by Peter Lang Publishing House (Contributions to Educational and Rehabilitation Psychology - Studies in Educational and Rehabilitation Psychology). This book series "Contributions to Educational and Rehabilitation Psychology" has been published since 2010 with the aim of documenting new scientific approaches and current trends from the widely branched areas of educational psychology and rehabilitation psychology (e.g. Witruk & Utami, 2019). The focus is on basic phenomena memory and learning, new learning methods that can be used in teaching and rehabilitation, learning and adjustment disorders and the processing of traumatic experiences, e.g. B. after serious natural disasters such as the 2004 tsunami in Southeast Asia.

Permanent - what remains forever?

Prof. Dr. Witruk is one of the internationally best-known professors at the Psychological Institute at the University of Leipzig. Her human and empathic work in the teaching, research and development of psychology is extensive and her work will continue to exist in the work of her graduate students in Germany and around the world.

You see the sun slowly setting and yet you are frightened when it is dark. (Franz Kafka)

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