

Dementia prevention

Playing bridge as a dementia prevention activity -insights

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Dementia

- ▶ Dementia is an umbrella term which includes a range of neurodegenerative diseases. Main symptoms of dementia are: memory loss, difficulty with problem solving, and difficulty in communicating. (Alzheimer's Society, 2015).

Mild Cognitive Impairment

- ▶ Mild cognitive impairment (MCI) is a disorder between 'normal ageing' and Alzheimer's disease. MCI describes people with cognitive impairment but not functional (Wenisch et al., 2007). MCI can go on to develop dementia (Tomaszewski Farias et al., 2009).

What are the risk factors for dementia?

- ▶ Age is the biggest risk factor for dementia.
- ▶ Factors associated with are: higher blood pressure, likelihood of illnesses (stroke), changes to cell structure and the immune system, weakening of the body's ability to repair itself over time (Alzheimer's Society, 2016c), depression (Saczynski et al., 2010), genetic risk factors for dementia.

Factors reducing the risk of dementia

- ▶ Several factors have been identified for reducing the risk of dementia including regular exercise, healthy weight and balanced diets, healthy cholesterol and blood pressure, and moderating alcohol intake (ARUK, 2015).
- ▶ Some recent recommendations underline the type of activity people engage with: social and mental activity may reduce the risk of developing dementia (Alzheimer's Society, 2016c).
- ▶ Active brain may establish cognitive reserve and allow the brain to be more adaptable and compensate for disruptions in function (National Institute on Aging, 2012b) .
- ▶ Additionally, people who participate in socially engaging or intellectually stimulating activities may be more likely to have other protective lifestyle factors.

Playing bridge as a sportmind therapeutic activity

- ▶ Bridge involves transferring memory from short-term memory to long-term memory (Engel and Bukstel, 1978) a process that may be inhibited for people with dementia (Miller, 1973). Engel and Bukstel (1978) note that Bridge is an opportunity for insight into memory due to the importance of working memory to succeed in the game; this may be a challenge for people with dementia as the condition impairs working memory (Kensinger et al., 2003).

Playing bridge as a sportmind therapeutic activity

- ▶ In spite that Bridge may not be a suitable intervention for people living with dementia, as it is a difficult game to learn and play, the fact that Bridge involves memory, social interaction and leisure, may make it a beneficial activity for people to engage with, particularly at a non-competitive level.

General hypothesis

Senior subjects staying Residential Home (RH) and Daily Nursing Home (DNH) who undergo bridge learning training and/or sports training compared to non-learning bridge players and not practising sport will obtain more favorable average results in the following operating parameters:

memory, speed of mental processes, executive functions, cardiac functions, anthropological functions, cognition disorders, positive emotion, engagement, relationships, meaning, accomplishment.

General hypothesis II

Senior subjects staying Residential Home (RH) and Daily Nursing Home (DNH) who undergo sports training compared to subjects who undergo bridge learning training will obtain more favorable average results in the following operating parameters:

memory, speed of mental processes, executive functions, cardiac functions, anthropological functions, cognition disorders, positive emotion, engagement, relationships, meaning, accomplishment.

Data collection methods

▶ What is measured?

- ▶ memory, speed of mental processes, executive functions, cardiovascular functions, anthropological functions, cognition's disorders, positive emotion, engagement, relationships, meaning, accomplishment

▶ What are the measurement tools?

- ▶ MCI Screening Test (MCI-ST), Neuropsychological Test Battery (NTB), Cardiovascular Risk Factors (CRF), PERMA Questionnaire

Research scheme. Slide I.

8-group natural experiment

Experimental group S.I	Experimental group S.II	Experimental group B.I	Experimental group B.II	Experimental group S-B.I	Experimental group S-B.II
PERMA pretest	Without PERMA pretest	PERMA pretest	Without PERMA pretest	PERMA pretest	Without PERMA pretest
MCI Screening Test (MCI-ST), Neuropsychological Test Battery (NTB), Cardiovascular Risk Factors (CRF), PERMA Questionnaire		MCI Screening Test (MCI-ST), Neuropsychological Test Battery (NTB), Cardiovascular Risk Factors (CRF), PERMA Questionnaire		MCI Screening Test (MCI-ST), Neuropsychological Test Battery (NTB), Cardiovascular Risk Factors (CRF), PERMA Questionnaire	
Only sports training, without training in bridge learning		Training in bridge learning		Sports training+Training in bridge learning	
<p>All posttests: MCI Screening Test (MCI-ST), Neuropsychological Test Battery (NTB), Cardiovascular Risk Factors (CRF), PERMA Questionnaire,</p>					

Research scheme. Slide II.

8-group natural experiment

Control group I	Control group .II
PERMA pretest	Without PERMA pretest
MCI Screening Test (MCI-ST), Neuropsychological Test Battery (NTB), Cardiovascular Risk Factors (CRF), PERMA Questionnaire	
Routine activity	
All posttests: MCI Screening Test (MCI-ST), Neuropsychological Test Battery (NTB), Cardiovascular Risk Factors (CRF), PERMA Questionnaire	

Research scheme. Slide III

The course of the bridge learning training game

Control of interfering phenomena

Learning the PERMA test based on the pretest.

Remedial action: Solomon's plan - four-group

Positive attitude resulting from the activity.

Remedial action: in the control group, a positive attitude towards participation in sports activities is induced, but without training learning to bridge game and cyclic entry of experimental groups I II III.

Training time to achieve the effect.

Remedial actions: comparison of groups of experimental groups with varied training time (post tests after each cycle)

Research sample

- ▶ **Targeted selection:** seniors from Residential Home (RH) and Daily Nursing Home (DNH)
- ▶ **Random selection:** to the experimental and contravailability of respondents: RH and DNH residents group (4x30 = 120 subjects)

Availability of respondents: RH and DNH residents

Other research paramters

- ▶ **Duration of the study:** 26 weeks, the bridge learning training game takes 2,5 plus a month to prepare the report plus 3 months to prepare the Polish version of PERMA. **Total 12 months.**
- ▶ **Data analysis methods:** one-factor Anova, two-factor Anova, factor analysis, estimators: average standard deviations, skewness, dystrunative power analysis,
- ▶ The final effect is an empirical report.

Expected results and recommendations

- ▶ If the hypothesis is confirmed, recommendations will be formulated to implement the bridge learning training system for Residential Home (RH) and Daily Nursing Home (DNH).

References

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Academic achievements

Wlodzislaw Duch

- ▶ Head of the Neurocognitive Laboratory in the Center of Modern Interdisciplinary Technologies and for many years has been running the Department of Informatics both at Nicolaus Copernicus University, Torun, Poland. Currently his laboratory is hosting Polish node of the International Neuroinformatics Coordination Facility (INCF). He has worked as the Nanyang Visiting Professor (2010-12) in the School of Computer Engineering, Nanyang Technological University, Singapore where he also worked as a visiting professor in 2003-07. MSc (1977) in theoretical physics, Ph.D. in quantum chemistry (1980), postdoc at Univ. of Southern California, Los Angeles (1980-82), D.Sc. in applied math (1987); worked at the University of Florida; Max-Planck-Institute, Munich, Germany, Kyushu Institute of Technology, Meiji and Rikkyo University in Japan, and several other institutions. He is/was on the editorial board of IEEE TNN, CPC, NIP-LR, Journal of Mind and Behavior, and 14 other journals; was co-founder & scientific editor of the “Polish Cognitive Science” journal; for two terms has served as the President of the European Neural Networks Society executive committee (2006-2008-2011), is an active member of IEEE CIS Technical committee; International Neural Network Society Board of Governors elected him to their most prestigious College of Fellows, and elected member of the Complex Systems Committee of the Polish Academy of Arts and Letters. Expert of the European Union science programs (FP4 to Horizon 2020), member of the high-level expert group of European Institute of Innovation & Technology (EIT). Has published over 350 peer-reviewed scientific papers and over 220 popular articles on diverse subjects, has written or co-authored 5 books and co-edited 21 books, his DuchSoft company has made GhostMiner datamining software package marketed by Fujitsu.

Academic achievements

Kornelia Kędziora-Kornatowska

Head of Department of Geriatrics Nicolaus Copernicus Copernicus University in Toruń, Collegium Medicum in Bydgoszcz since 2001. She earned her PhD in 1993, her habilitation in 1999. She received title of professor in 2009. Her research focuses on aging processes and diseases of elderly („of aging” and „in aging”). For last 18 years she has been conducting various studies of molecular, neuropsychological and clinical aspects of aging and age-related diseases. She published numerous peer-reviewed articles and co-authored several books in topic of gerontology. She also took part in several studies in field of clinical gerontology. Among them was “Polsenior” project exploring medical, psychological and socioeconomical aspects of aging in Poland (2006-2010) in which she had leadership role, as well as GRADYS program which looked into practical applications of virtual reality (VR) in enhancing cognitive functions in elderly (2014-2016). She is Editor-in-Chief of “Polish Gerontology”, official journal of Polish Gerontological Society, and Dean of Faculty of Health Science, Collegium Medicum in Bydgoszcz, Nicolaus Copernicus University in Toruń (since 2012).

Academic achievements

Krzysztof Rubacha

Head of the Department of Pedagogical Research Methodology NCU, Laboratory of Research Tools at the Polish Academy of Sciences, and a Editor-in-Chief of the Educational Studies Review. He deals with the methodology of scientific research: social and natural, statistical analysis of data, designing the research process and conducts empirical research on the psychosocial functioning of adults. He is the author of many tests to measure the level of self-fulfillment, ethical orientation, educational strategies, performing social roles, and implementing adult developmental tasks. He received a doctoral degree at the University of Warsaw in 1994, a postdoctoral degree at the Nicolaus Copernicus University in 2000 and the title of professor in 2010.

Academic achievements

Piotr Błajet

Head of the University Sport Center NCU. Member of The Scientific Committee of The World Bridge Federation. He deals with health education, sport pedagogy, conducts empirical research on the psychosocial aspects of development in adulthood. He received a doctoral degree at the Academie of Sport in Warsaw (sport physiology), a postdoctoral degree at the Nicolaus Copernicus University in 2006 and the title of professor in 2014.

PROF. BRUNO VELLAS

- ▶ Né le 10 Mai 1957 à Toulouse, le Professeur Bruno Vellas est coordonnateur du Gérontopôle à Toulouse, Chef de service du département de médecine interne et de gériatrie du CHU de Toulouse, responsable du CMRR (Centre de mémoire de ressource et de recherche clinique de la maladie d'Alzheimer) à l'Université de Toulouse et membre de l'unité Inserm U1027.
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- ▶ Le Professeur Vellas est à l'origine de l'EADC (*European Alzheimer Disease Consortium*), il coordonne le réseau du CeNGEPS sur la maladie d'Alzheimer et a présidé la société mondiale de Gérontologie et de Gériatrie.
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- ▶ Il a obtenu son diplôme de médecine et de professeur à l'université Paul Sabatier de Toulouse. Depuis plus de quinze ans, il est très impliqué dans l'activité de recherche autour de la maladie d'Alzheimer et a publié plus de 500 articles dans des revues internationales.
- ▶
- ▶ Il est membre du comité scientifique de nombreuses revues scientifiques internationales. Il est le principal investigateur de nombreux essais thérapeutiques internationaux sur la maladie d'Alzheimer.
- ▶
- ▶ Il est membre correspondant de l'Académie de Médecine

PROF. PAOLO WALTER GABRIELE

- ▶ Nato a Sant'Elia Fiume Rapido e residente nella città martire, il dr. Paolo Walter Gabriele si è laureato in Medicina e Chirurgia presso l'Università degli Studi di Roma "La Sapienza" ed è iscritto all'Ordine dei Medici della provincia di Frosinone.
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- ▶ Si è specializzato prima in Neurochirurgia, sempre all'Università degli Studi di Roma "La Sapienza", e successivamente in Neurologia all'Università di Milano. Esercita, prevalentemente a Roma e Cassino, l'attività di neurologo e neurochirurgo.
- ▶ È docente di Neurologia presso la facoltà di Scienze Motorie dell'Università degli Studi di Cassino.
- ▶ Il dr. Paolo Walter Gabriele ci ha autorizzato a riportare su questa scheda il suo numero telefonico
- ▶ 0776-24285 ed il suo e-mail pw.gabriele@unicas.it

MAREK MALYSA PhD

- ▶ Retired math teacher at Gdańsk University of Technology (PhD in 1985) still teaching there but now giving bridge lessons to students and professors as well.
- ▶ V-ce President of Polish Bridge Union and Board Member since 2012 .
- ▶ On site organizer of World Bridge Games in Wrocław 2016 (former bridge Olympia) .
- ▶ Author and leader of BRIDGE 60+ program . Motto „Bridge against dementia and social isolation”tells all about its aims. Within 5 years more then 270 centers were created to allow elderly to learn bridge and play later on as alternative to staying at home and waiting for.....
- ▶ Program was accepted by 23 countries in Europe and presented also in South America , Africa and Asia Pacific region.
- ▶ Author of „Play bridge with grandchildren” project connecting generations .
- ▶ Chairman of BRIDGE &SCIENCE Committee World Bridge Federation , member of Senior Committies World Bridge Federation and European Bridge League.
- ▶ Bridge expert in NukkAi project - Artificial Inteligence trying to win with World class players.
- ▶ Coorganizer International Scientific Conferences dedicated to bridge .
- ▶ Participant in Alzheimer Europe Conferences in Berlin 2017 and Barcelona 2018 presenting current research results how bridge prevents dementia.
- ▶ As bridge player participated in several World and European Championships.
- ▶ For my friends from 16 countries I organize each year Invitational Teams Event called BRIDGE FOREST TROPHY with almost 100 players competing and having fun.
- ▶ I was also captain of Polish National Youngsters Team at European Championship in Wrocław and World Championship in Istanbul.

