Effect of Brain-Stimulating Games and physical activity on Cognitive Functioning in Dementia in Calabar

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We declare no conflict of interest

Learning objective

To explain the effects of brain-stimulating games and physical activity on cognitive functioning in people with mild dementia in Calabar, Nigeria.

BACKGROUND

The elderly population in Nigeria has grown rapidly in the last two decades and is becoming more visible with its challenges

With the ageing population, the prevalence of dementia has also increased in the last two decades

- **The pooled prevalence of dementia is 4.9% (6.4% in North-Central; 5.4% in North-West; and 4.6% in South-West) [Adeloye et al, 2019]**
- **Prevalence is reported to be higher in women and in urban areas**

Several challenges to dementia care in Nigeria:

- Dementia is poorly understood
- Population-wide response is lacking
- No comprehensive dementia care in most health institutions

Lack of understanding about dementia, and the ‘lunacy and witchcraft’ myths

Stigmatization, rejection and neglect of the affected

- **Dementia literature highlights the value of the arts and use of emerging non-pharmacological treatment options (music, dance, brain games, and physical exercises) for improving cognitive functions in dementia [Karkou & Meekums 2017]**

- **Such treatment options are increasingly being used to enhance memory and mood in older people and evidence suggests their positive effect on cognitive functions [Fusar-Poli et al, 2017; Groot et al, 2016; Lamb et al, 2018; Palaus et al, 2017; West et al, 2017]**
- **Studies on such alternative treatment options are scarce in Nigeria**

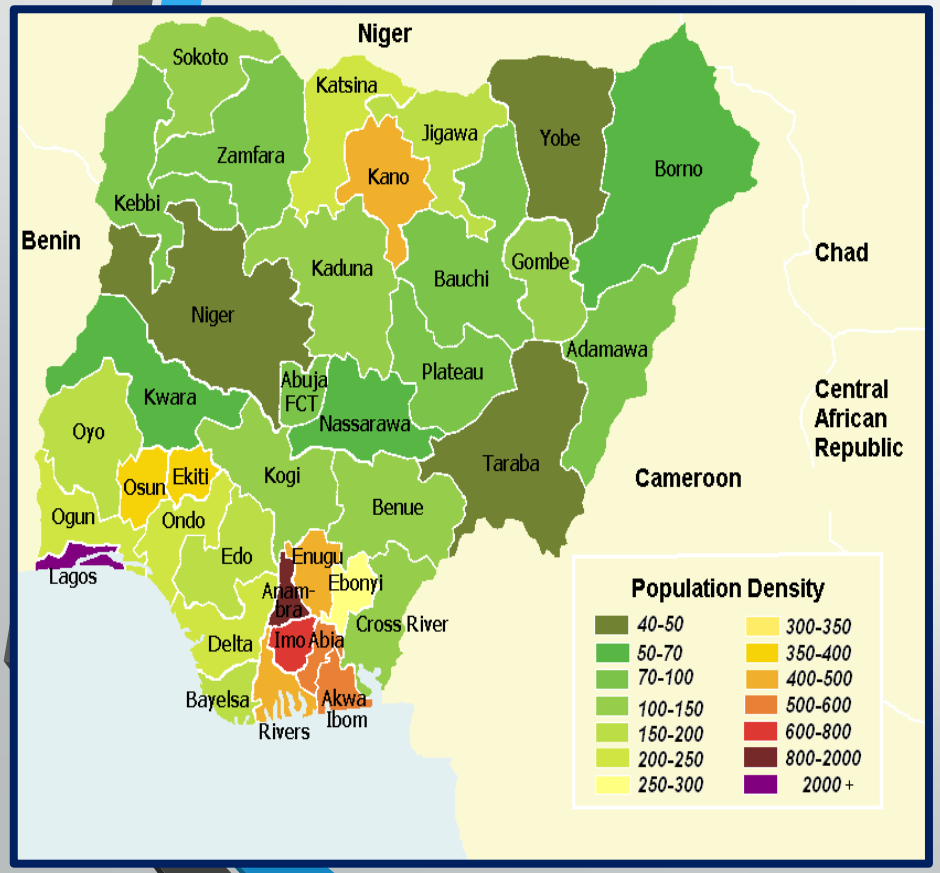
AIM OF STUDY

Determine the short-term effects of brain-stimulating games and physical activities on cognitive functions in old people with mild dementia

- **Five Cognitive functions were evaluated:** ***Memory of everyday events, Attention span, Judgment, Processing speed, and Reasoning***

Materials and Methods

Setting of the study: Two ‘Old People’s Homes’ in Calabar, Cross River State of Nigeria


Niger
Sokoto
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Kano
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Chad
Niger
Adamawa
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Abuja FCT
Kwara
Central African Republic
Nassarawa
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Taraba
Osun
Ekiti
Kogi
Cameroon
Ogun
Ondo
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Enugu
Lagos
Ebonyi
Anam-bra
Cross River
Delta
Imo
Abia
Bayelsa
Akwa Ibom
Rivers
Population Density
40-50
50-70
70-100
100-150
150-200
200-250
250-300
300-350
350-400
400-500
500-600
600-800
800-2000
2000 +


Nigeria

- **Design:** Mixed method - quantitative (Intervention) and qualitative (Exploratory)
- **Ethical clearance:** From Cross River State Health Research Ethics Committee, with permission from relevant gatekeepers, and voluntary informed consent from participants

- **Participants:** 21 participants [13 people (71 years and above) with mild cognitive impairment and 8 home caregivers, called ‘caretakers’] were enrolled
- **Inclusion criteria:** Scores on Community Screening Interview for Dementia and the Five-Word Test indicating mild cognitive impairment

Intervention

1. Physical exercises:

- Thirty (30) minutes of supervised aerobics + 30 minutes walking + 45 minutes dancing, interspersed with 20 minutes rest periods
- These group exercises were on alternate days (3 days a week for 12 weeks, giving a total of 36 sessions)

2. Brain Games:

Five (5) selected Google play games *(on adventure, football/soccer, entertainment)* and 5 mentally stimulating board and word games *(Chess, Scrabble, Draft game/checkers, Cross-word puzzle, Sudoku)* for one hour each day on alternate days (3 days/week for 12 weeks, total of 36 sessions)

Instruments

- ***Quantitative:*** **Validated structured interview schedule with 32 Likert-type items adapted from 2 standardized instruments - Mini-Mental State Examination [Folstein et al,1975]; and Test of Everyday Attention [van der Leeuw et al, 2016].**

Qualitative data: **Instrument for data collection was an Interview schedule with 12 non-structured, open-ended questions**

Data collection

Quantitative data:

Data on 5 cognitive functions were collected three times (before intervention, two weeks after the 12 weeks intervention, and 8 weeks later (week 0,14, 22)

Qualitative data:

Verbal responses about changes in behaviour in the aged were collected from caregivers (‘caretakers’), and recorded on audio-tapes and field notes

Data Analysis

Quantitative

Descriptive and inferential statistics analysed on SPSS 20.0

Qualitative

Transcribed and coded for thematic content analysis on NVivo 10.0


results

Socio-demographic characteristics

Age:

- Participants with dementia: 75±3.4 years
- Caretakers: 41±2.6 years

Marital status:

- Aged participants: 69.2% Widowed, 30.8% Divorced
- Caretakers: 100% were married

Gender:

- Aged participants: 38.5% Male, 61.5% Female
- Caretakers: 25% Male, 75% Female

Highest Education obtained:

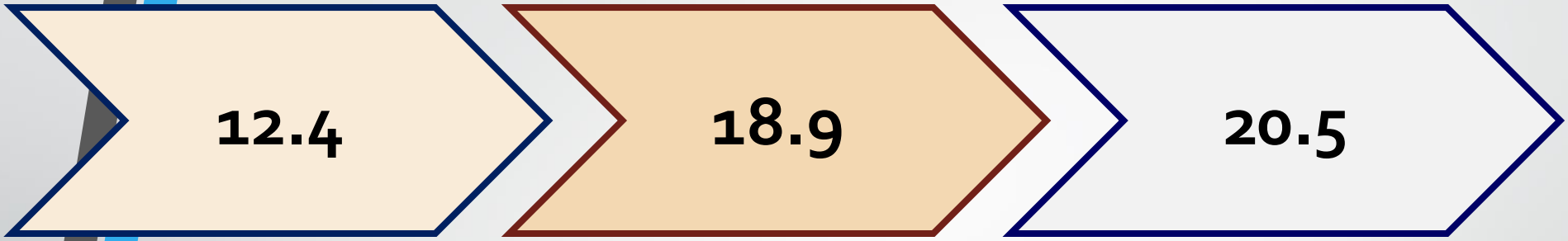
- Aged participants: 76.9% secondary education
- Caretakers: 100% secondary education

Quantitative results:

- **All older participants had both interventions so results were for a combination of mind-stimulating games and physical activity**

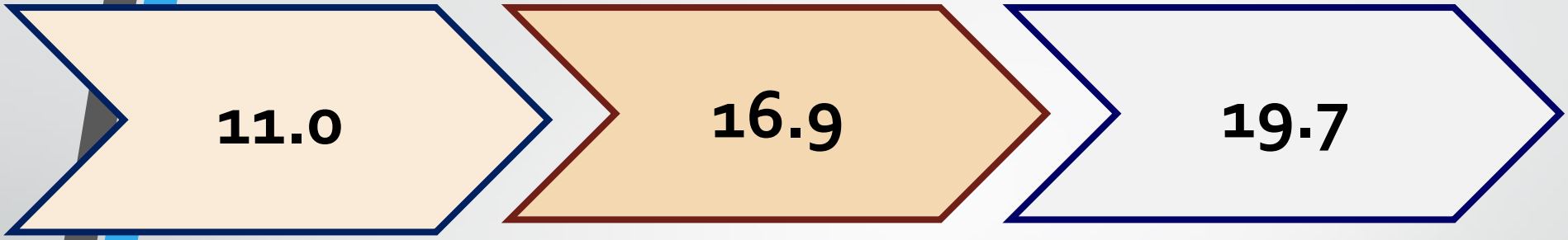
- **Mentally stimulating games and physical activity interventions positively and significantly influenced cognitive functions in patients with mild dementia, both at the first and second post-tests**

Reasoning



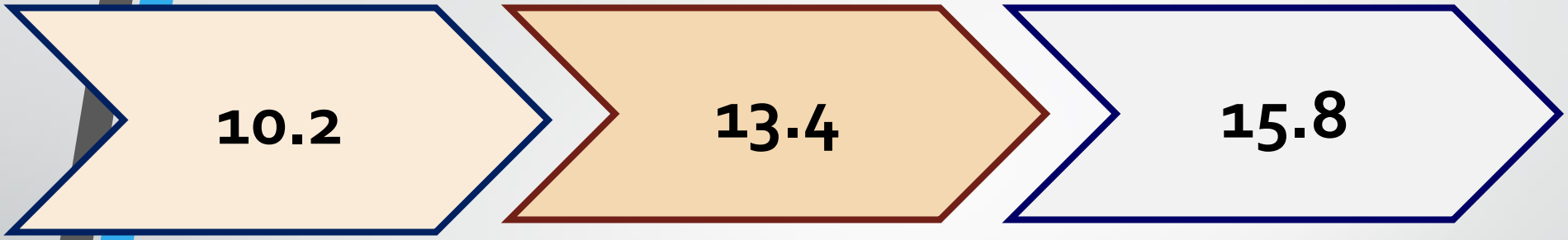
Processing speed

Judgment



Attention span

Memory of everyday events



There was no significant difference in scores on the basis of gender

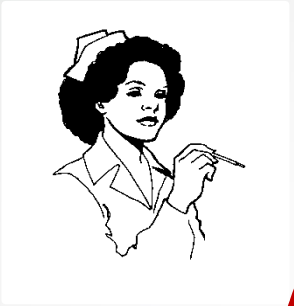
Qualitative results:

- **Caregivers (‘caretakers’) reported significant changes in mood, memory and attention span in the old people who participated in the study**

Three themes emerged from qualitative data:

- ***'Eagerness to engage in activities';***
- ***'Taking better care of self-hygiene';***
- ***'Looking happier and more friendly'***

‘Eagerness to engage in activities’



“…They now seem eager to engage in the Home activities and household chores…”

“Our ‘mamas and papas’ now wake up early and are eager to start the day’s activities”

'Taking better care of self-hygiene'

"Before now we had issues with their self-hygiene, now they do it without persuasion"

"For 3 weeks now, they are serious about self-hygiene… and better self-care"

‘Happier and more friendly’

“I have never seen them looking so happy, more friendly, and expectant”

“Mrs E was always reclusive, but now she seems happier and more friendly”

DISCUSSION

- **Results are similar to studies concerning physical activities/exercises by Raleigh & Shaha, (2014); Lamb et al, (2018); Groot et al, 2016); but different from Forbes et al, (2013) who found no clear evidence of positive effect of exercise on cognitive functioning**

- **Results are also in line with report by Anderson, (2016) about studies in Sydney and Montreal showing that brain training and brain-engaging games improve memory, mood, and attention in older people with mild cognitive impairment**

Implications:

- **Findings have both local and global implications for enhancing social engagement, self-esteem and cognitive wellbeing in people with dementia**

CONCLUSION

- **Mentally stimulating games and exercises are capable of improving cognitive functions in old people with mild dementia**

There is need for further studies to determine the effect of:

- **Individual interventions (physical activity, or brain-stimulating games) on cognitive functions**
- **Both interventions on moderate and severe dementia**

LESSONS LEARNED

- People with dementia tend to be left alone by carers because of their lack of interest in daily activities
- Physical stimulation influences their mood/affect and makes them become more engaged. This was evident six weeks into the twelve weeks of intervention

شكراً جزيلاً
ngiyabonga
рахмат
danke
謝謝
spas
teşekkür ederim
Баярлалаа
mersi
kia ora
barka
welalin
tack
mahalo
tapadh leat
спасибо
faafetai lava
vinaka
спасибі
blagodaram
dank je
misaotra
paldies
grazzi
matondo
gracias
kiitos
dankie
nanni
nandri
dhanyavad
mauruuru
thank you
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asante
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bedankt
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감사합니다
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merci

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