

# mobile monitoring and coaching

Marjolijn Sorbi  
Utrecht University



Universiteit Utrecht

# mobile monitoring and coaching



example

migraine self-management

# prevalence

Figure 3.3.1 Population-based epidemiological studies of migraine



Note: All studies used International Headache Society criteria (or reasonable modifications of these criteria) for diagnosing migraine and were conducted in general population or community-based adult samples of at least 500 participants. Numbers are estimated 1-year prevalences.  
Source: (3).





## cognitive-behavioral treatment or training(**CBT**) in migraine

**Grade A**

international neurological guidelines

<b>USA</b> 2000 adults <b>children</b>	<b>GER</b> 2005 adults <b>children</b>	<b>UK</b> 2007 adults <b>children</b>	<b>NL</b> 2007 adults <b>children</b>
✓	✓ ✓	✓ (✓)	✓ ✓

## attack prevention

CBT provision	improvement attack frequency
psychologist	30-55%
junior psychologist/master student	30-45%
self-management training	21-23%
placebo control	10%

Haddock et al. ... Meta-analysis of controlled trials. *Cephalalgia*, 1997.

Goslin et al. ... Technical review 1999. Available at <http://www.ntis.gov>

Sorbi MJ. *Psychological Intervention in Migraine*. Academic Dissertation, november 1988.

Mérelle SYM. *Migraine Trainers as Models*. Academic Dissertation, december 2008.



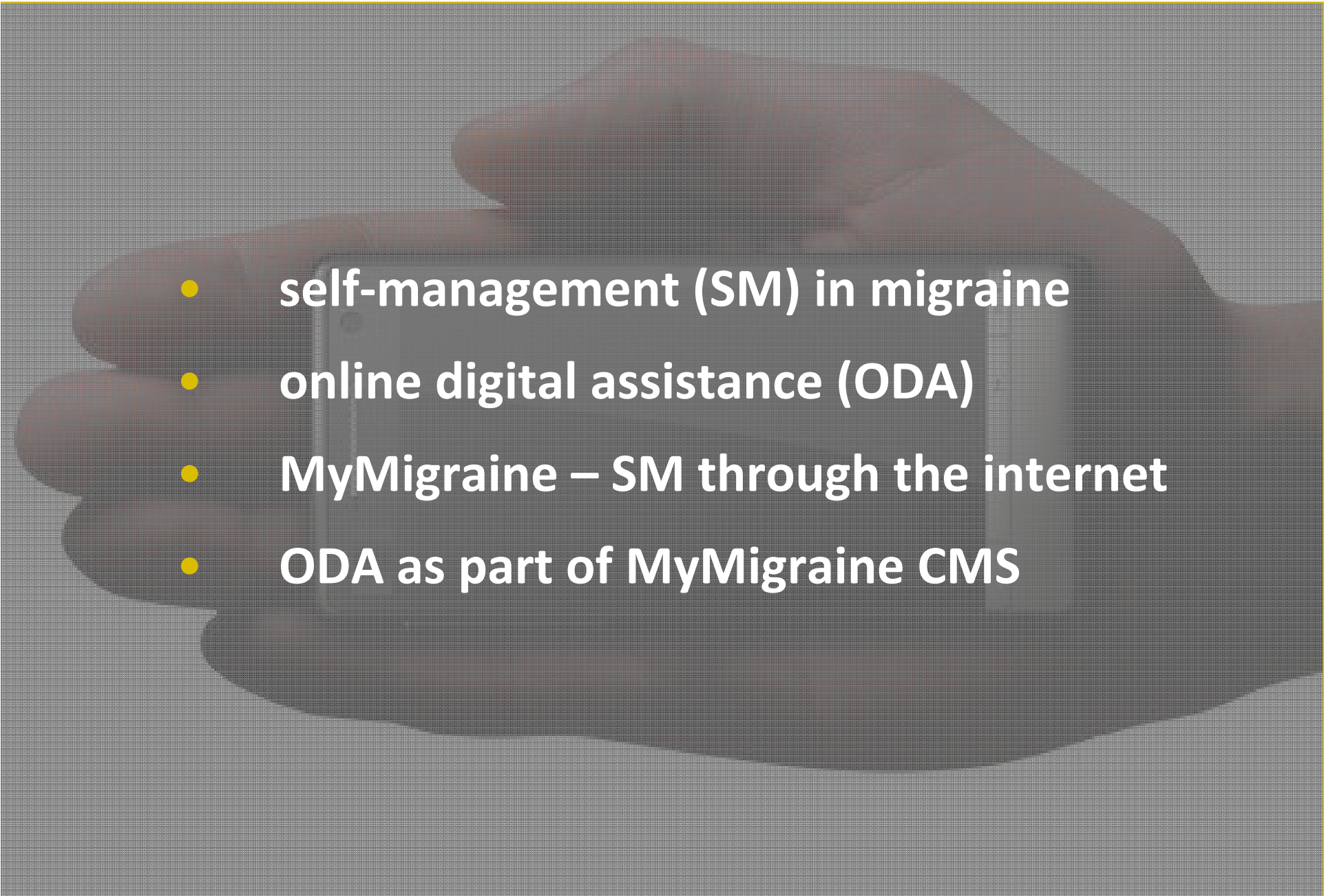
# mobile monitoring and coaching



to support  
migraine self-management

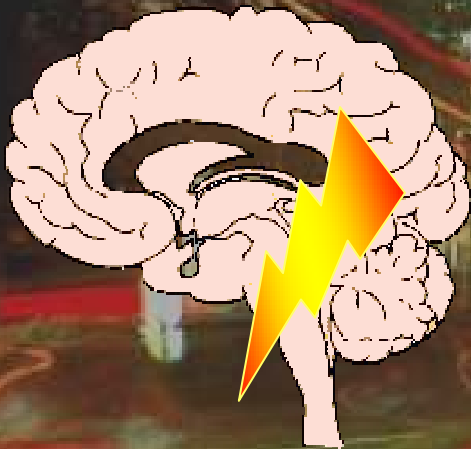




- 
- A hand holding a smartphone, with a list of bullet points overlaid on the screen. The background is a textured grey.
- self-management (SM) in migraine
  - online digital assistance (ODA)
  - MyMigraine – SM through the internet
  - ODA as part of MyMigraine CMS

# view on migraine

*“The world shouts at the migraine patient”* **Peter Goadsby, 2003**



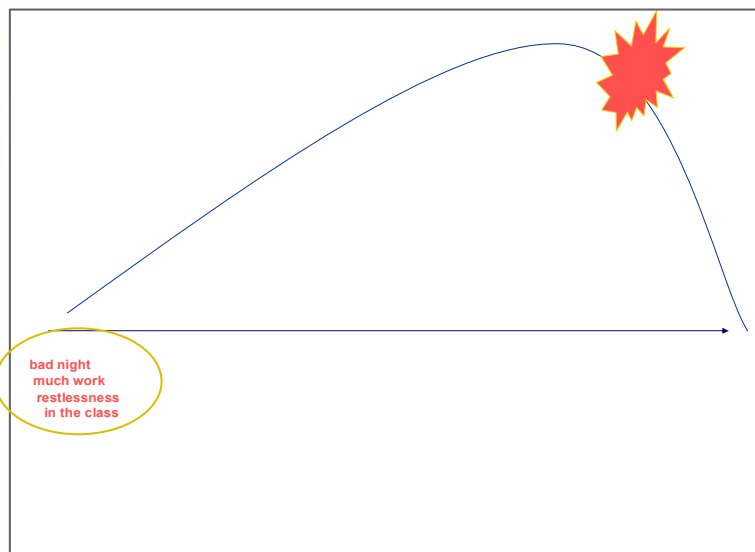
migraine  
generator:  
**brain stem**



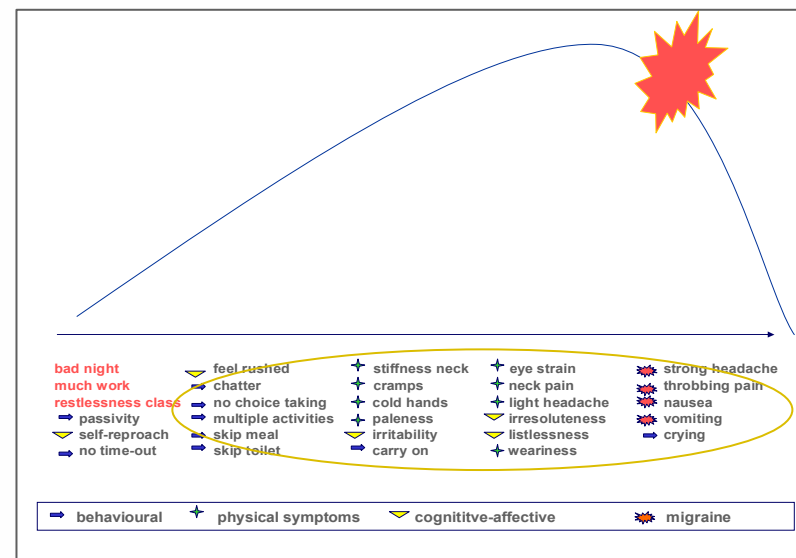
sensitivity hours  
before the attack  
**(prodromal stage)**



# view on migraine warnings



triggers (external)



premonitory symptoms (internal)



# **grip** on migraine

**body  
relaxation**  
for attack  
prevention



# **grip** on migraine



A close-up photograph of a person's hand holding a black smartphone. The phone's screen is dark, and the words "Online Digital Assistance" are displayed in a bold, yellow, sans-serif font. The hand is positioned with the thumb at the top and fingers supporting the bottom and sides of the device. The background is a plain, light color.

**Online Digital  
Assistance**





**ODA**  
**1.0**  
**2005**



**ODA**  
**3.0**  
**2007**

**mobile**

**online**  
**digital**

**assistance in real life**

**EMA**  
**monitoring**  
**online**

**direct**  
**coaching**  
**online**



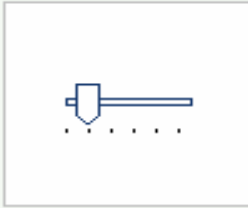
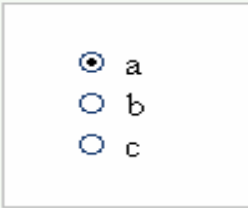
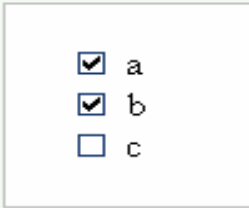
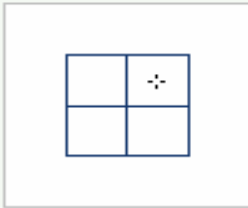
Sorbi, MJ et al. *J Med Internet Res* 2007; 9:e38.

Sorbi MJ, Rüddel H, Bühring MEF (eds). *Frontiers in Stepped eCare*. Utrecht University, 2007.

# ODA online monitoring

- EMA: random beeps, 2x/day
- beep diary (36 items, branched; 5 min)
  1. migraine & medication use
  2. view on migraine
  3. grip on migraine

- answer options

		
open answer	numerical answ	VAS
		
multiple choice	multiple response	'sleep-vraag'



## ODA online monitoring



## ODA online monitoring







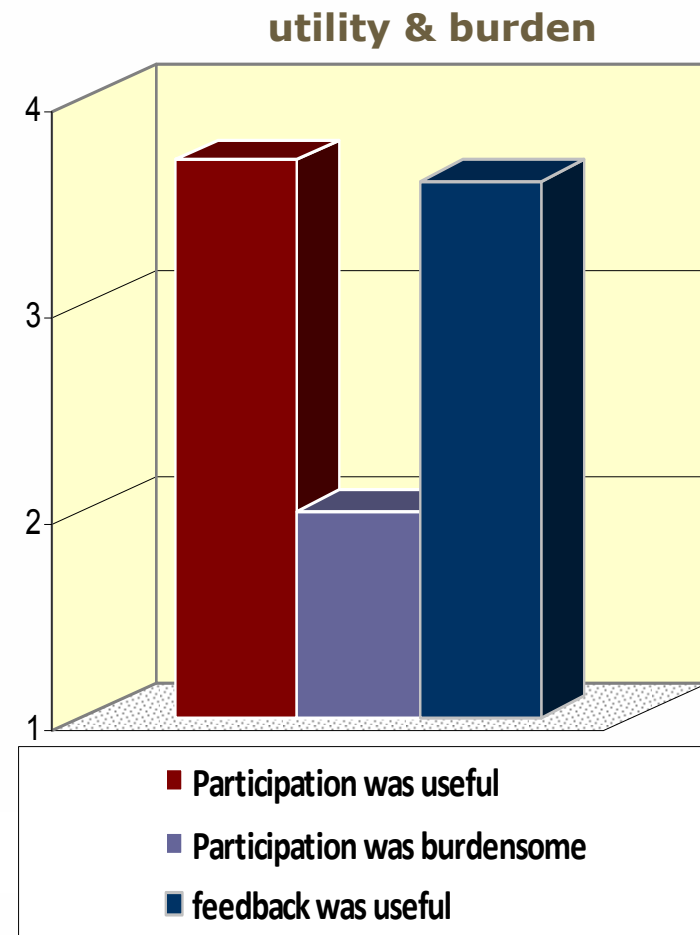
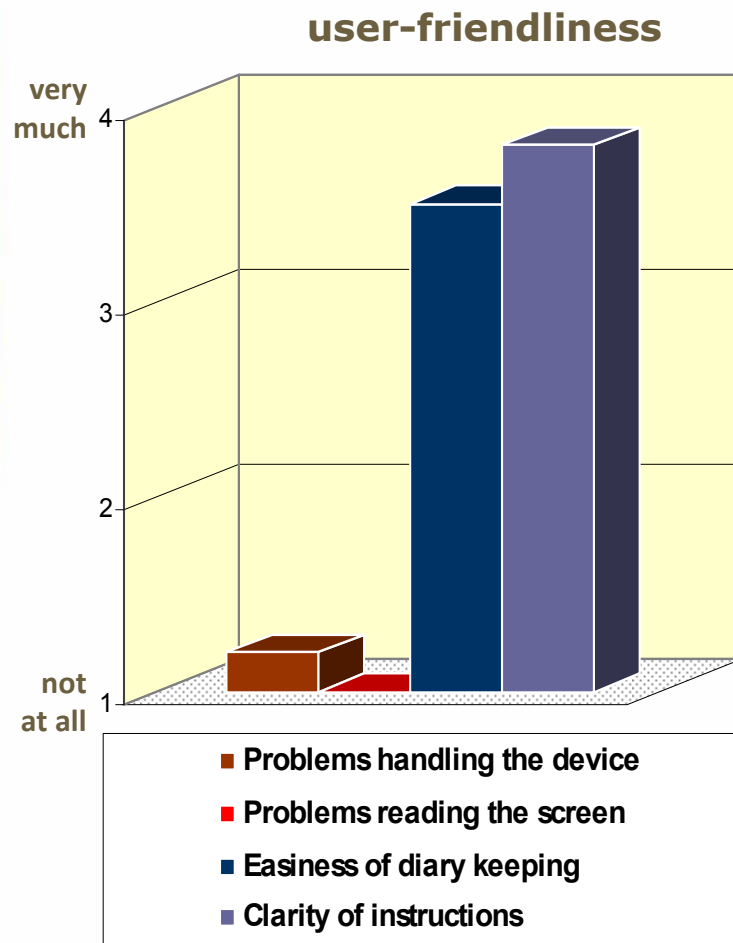
## ODA online coaching

- **personal feedback (ODA 1.0, 3.0, 4.0)**
  - **assistants**
  - **anonymity** (user only known by nickname)
  - **use of template & decision aids in the software**
  - **brief text with traffic light & emoticon**
    - **actual state** (view on migraine)
    - **tips & advice** (grip on migraine)
    - **pep-up** (reinforcement)
- **graphs of combined items (ODA 2.0)**

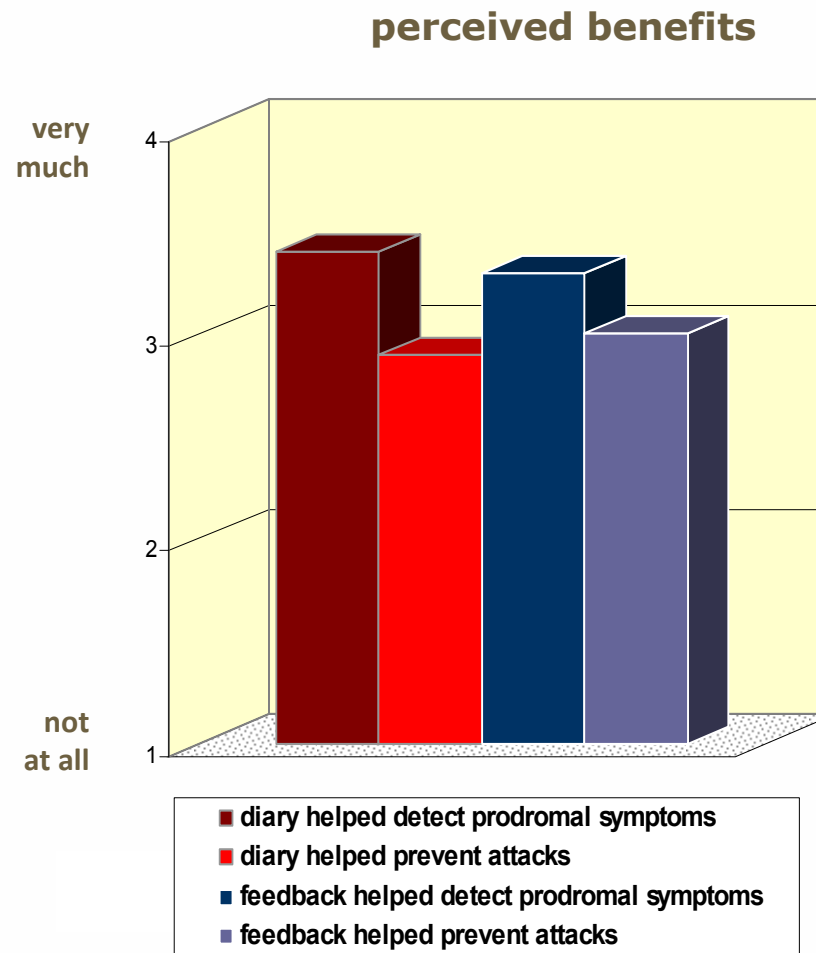
# ODA online coaching



## ODA - clinical utility during SM training N=44, 3 wks



## ODA - clinical utility during SM training N=44, 3 wks





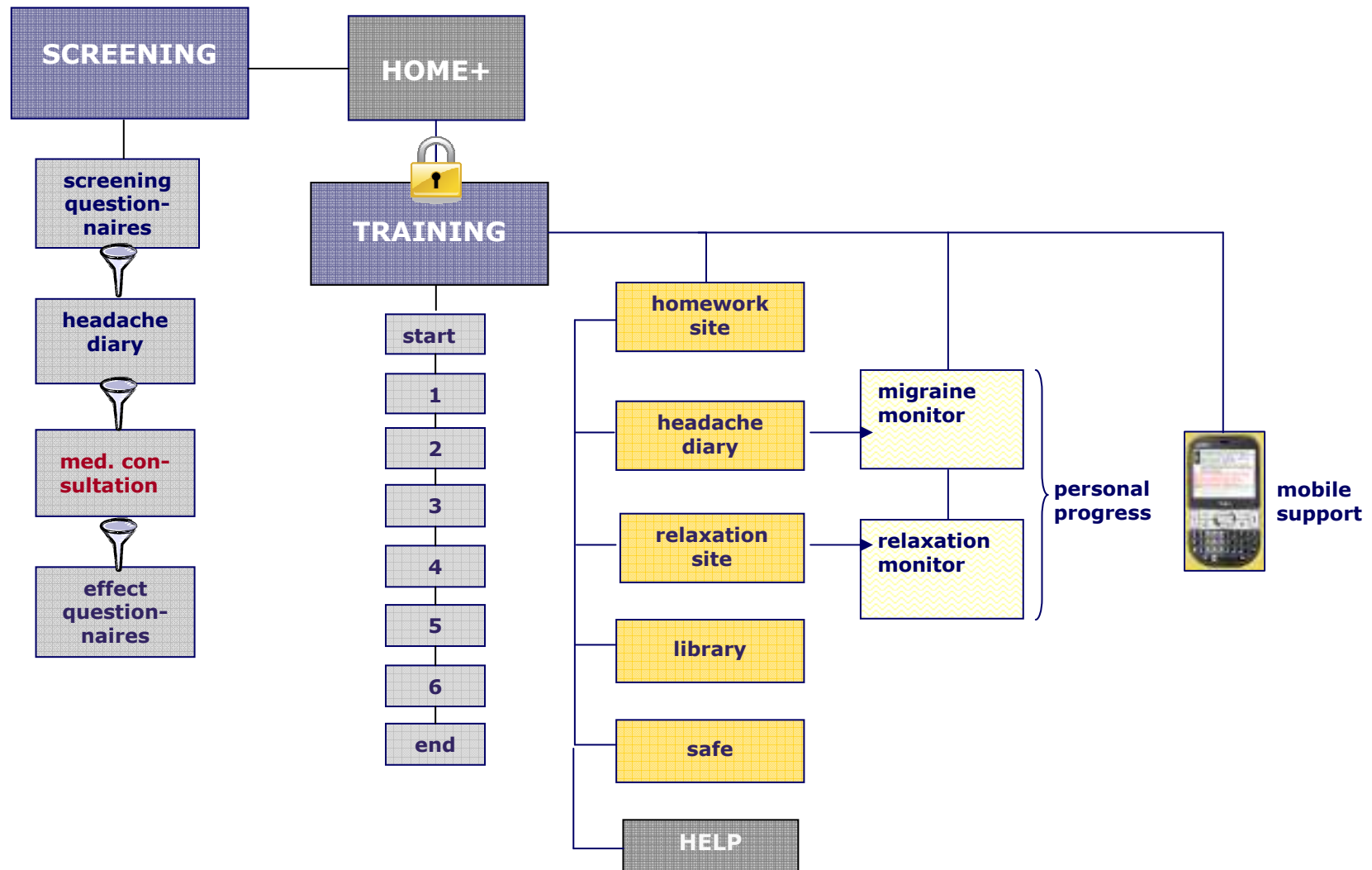
A close-up photograph of a person's hand holding a black smartphone. The phone's screen is on, displaying a title slide. The background of the slide is dark with a subtle, light-colored curved line. The text is centered on the screen.

# My Migraine

2008

internet training  
content & technology

# MyMigraine - front office: screening & training



# MyMigraine - 8 lessons 5 help buttons

headache diary



relaxation site



safe



homework site



library



home introduction

films of  
exemplary  
patients

3

skill acquisition  
lesson 1-4



skill application  
lesson 5-8



## MyMigraine - homepage (only with log-in)



intro + background **PAULA**



intro + background **THEO**



intro + background **CAROLA**



## Cursus

## Kennismaking

1

Introductie



Kijk op migraine



Greep op migraine



Samenvatting



Huiswerk



Afsluiting



1: Risico's op een aanval

2

2: Risico's onder de loep

3

3: Risico's in kaart

4

4: Migrainerecept

5

5: Gezondheidsrecept

6

6: Zelfmanagement

7

Afsluiting

8

## Laatst bezochte pagina

Kennismaking



## Cursus: Kennismaking



## Welkom bij de kennismaking

Met deze cursus gaat u zelf aan de slag om uw migraine te verzachten en de aanval waar mogelijk te voorkómen. Het doel van deze cursus is dat u hiervoor uw eigen coach gaat worden.

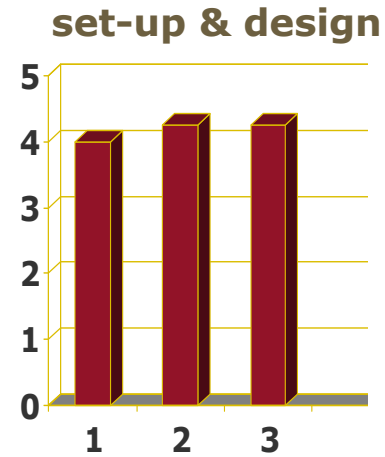
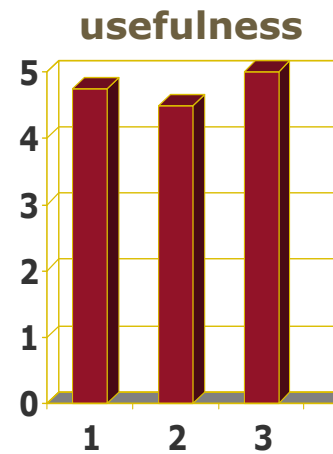
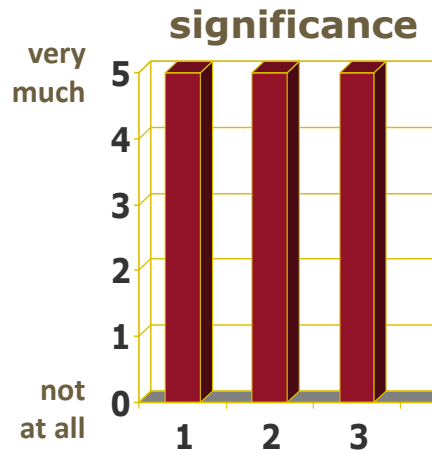
De kennismaking is bedoeld om u wegwijs te maken in de cursus.

Klik nu op de link om verder te gaan met de [Introductie](#)



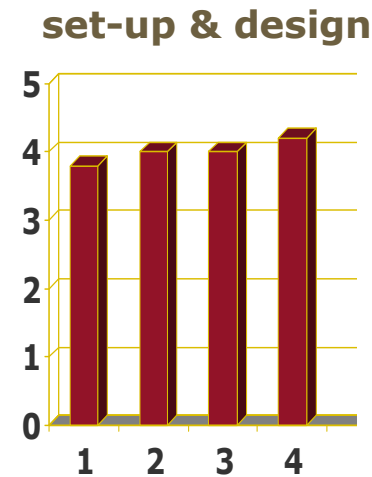
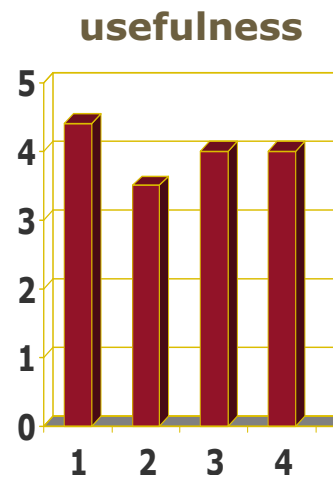
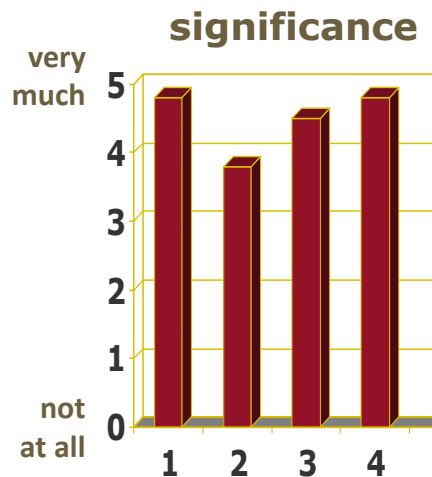
# MyMigraine - evaluation of content & technological support (expert patients, n=6)

## content



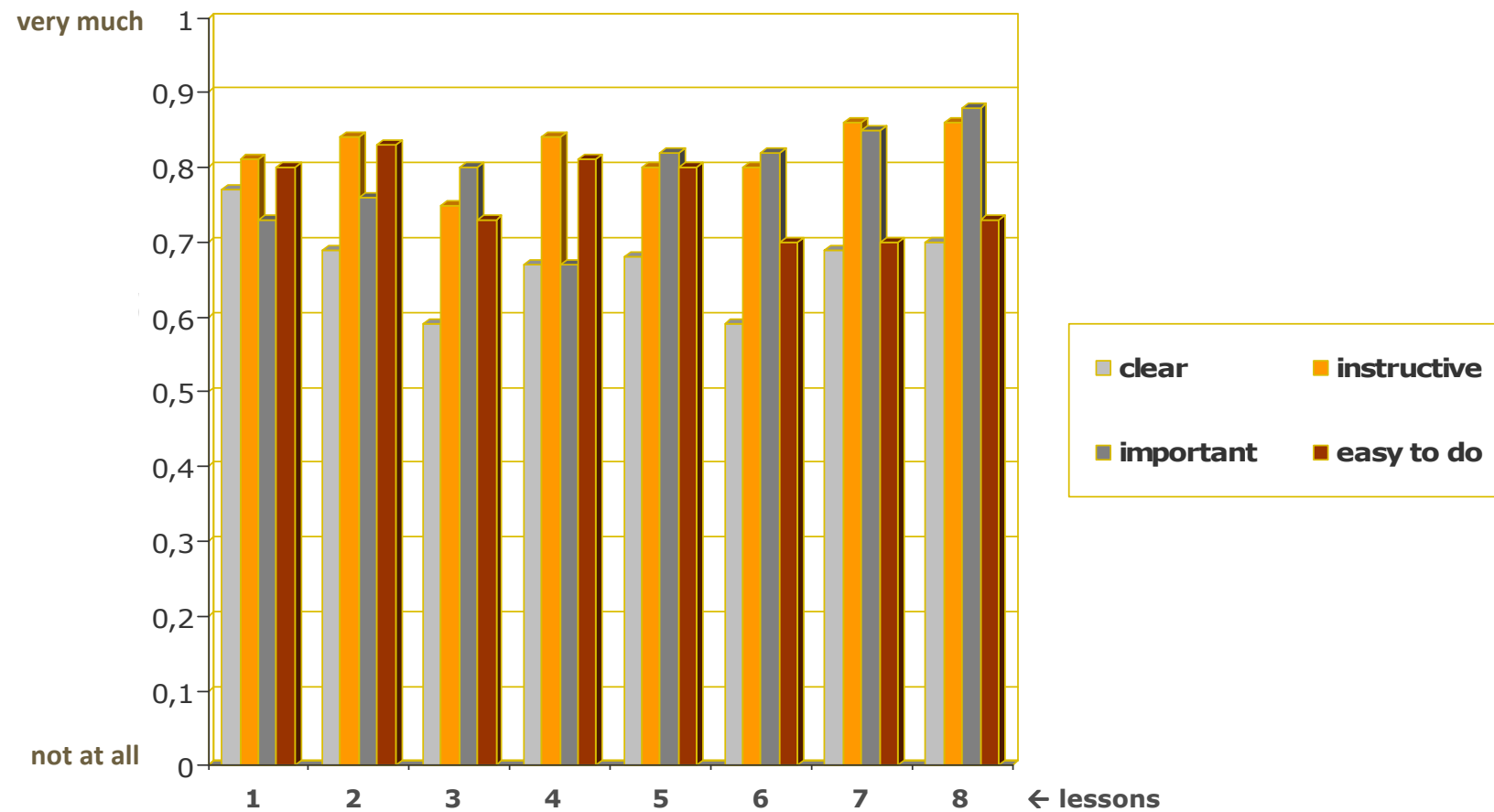
1= structure of training  
2= scope of total training  
3= content of lessons

## technological support

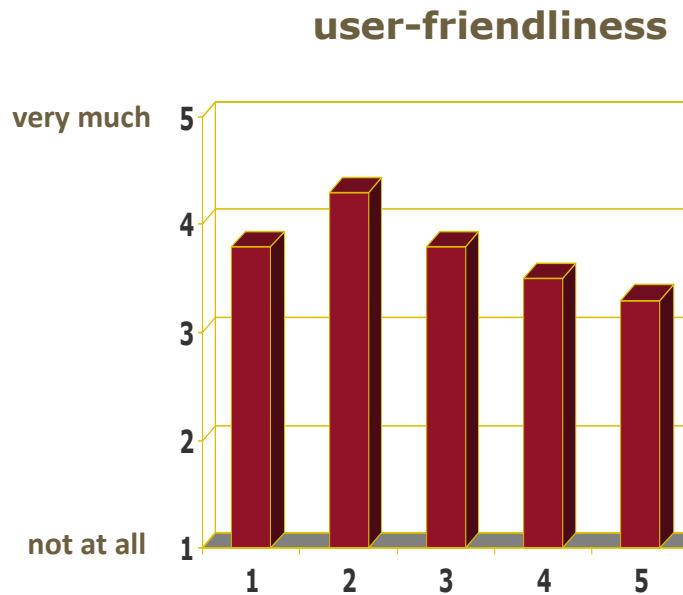


1= migraine monitor  
2= relaxation monitor  
3= films  
4= interactive exercise

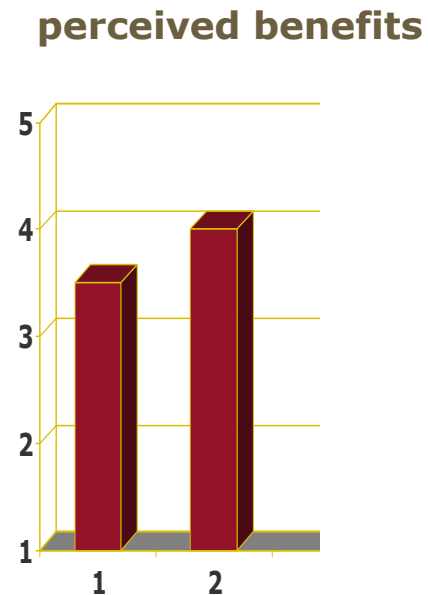
## MyMigraine – appreciation of the lessons (new participants, n=10)



# MyMigraine – user-friendliness & perceived benefit (new participants, n=10)



1= web application  
2= run through the lessons  
3= migraine monitor  
4= relaxation monitor  
5= homework management



1= detection of  
migraine warnings  
2= prevention of  
migraine attacks

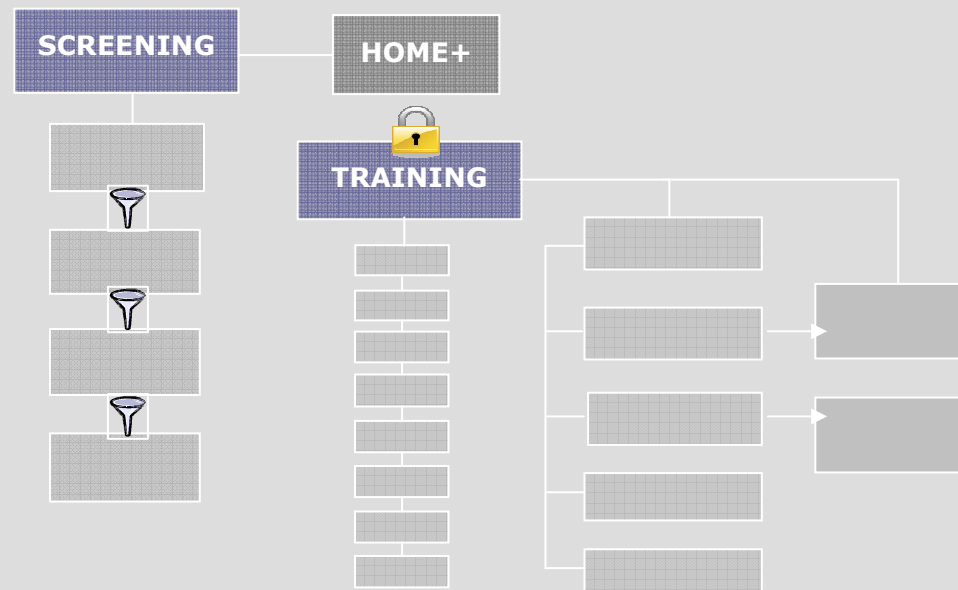
## MyMigraine - front office & back office

server hoosting - external maintenance

participant management - co-ordinator

## participant management - case manager

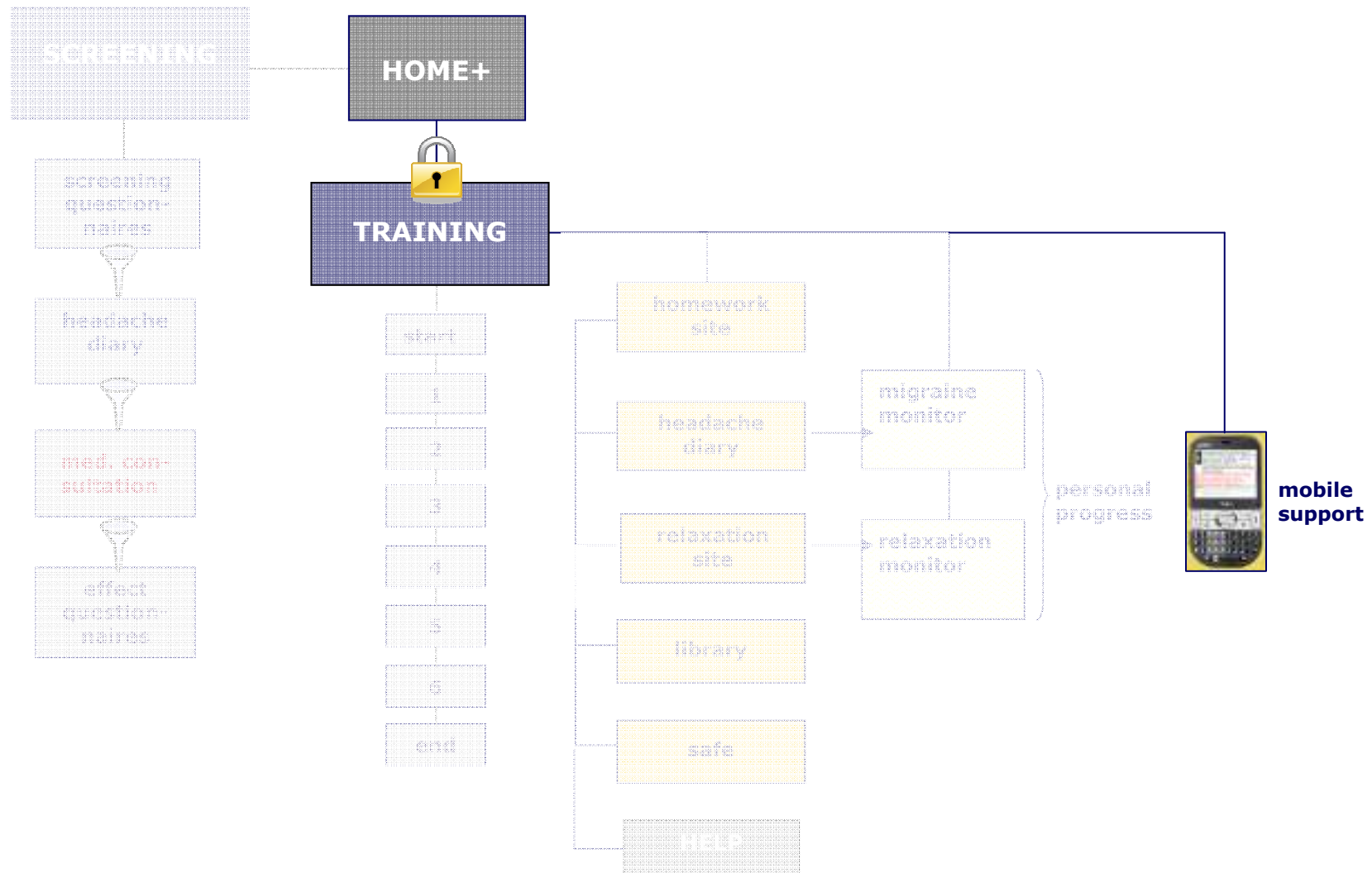
participant





# ODA – ODA within MyMigraine content management system

4.0  
2009





on our way to the virtual therapist

## ODA – ODA within the MyMigraine content management system

4.0  
2009



- ODA acceptance equally positive
- technology improved  
internet transmission problems  
2006: 4.1%      2009: 0%  
PDA hardware problems  
2006: 2.5%      2009: 0.5%
- compliance improved  
2006: 85%      2009: 100%



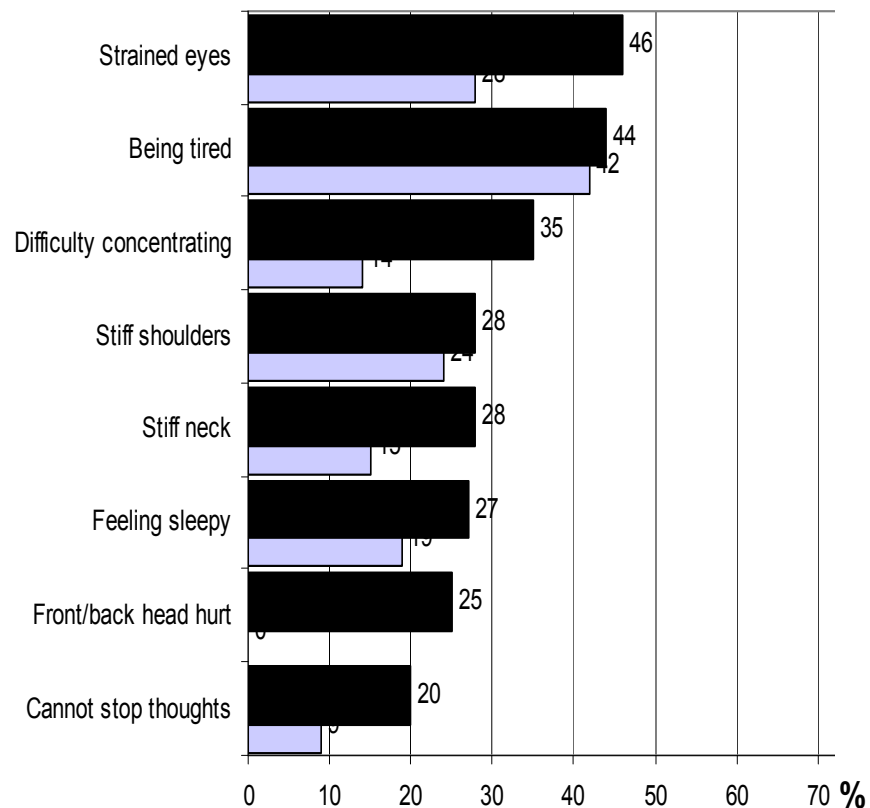
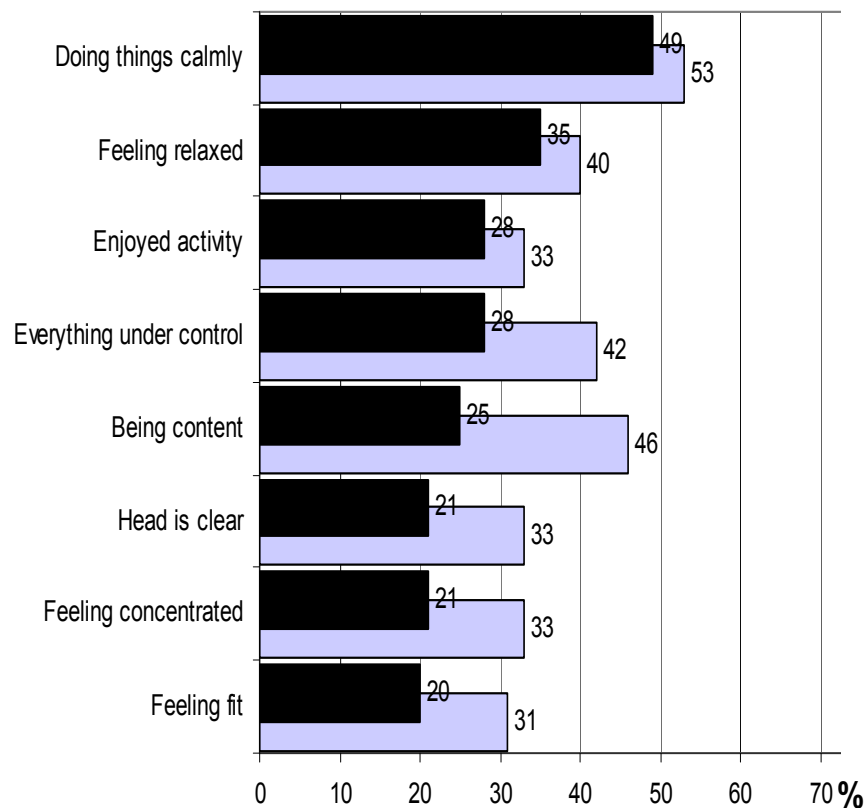


high-density

real time

data

## ODA output – momentary state before the attack compared to matched migraine-free control days





A close-up photograph of a person's hand holding a black smartphone. The phone's screen is on, displaying a dark background with yellow and white text. The hand is positioned palm-up, with the thumb and fingers visible around the edges of the phone.

thank you  
for your attention

m.j.sorbi@uyu.nl  
d.westhuis@uu.nl  
h.g.vansilfhout@uu.nl



**Universiteit Utrecht**