THE 21ST CENTURY PHYSICIAN: EMPOWERED PHYSICIANS IN THE DIGITAL HEALTH ERA

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MASLOW’S HIERARCHY OF HEALTHCARE
GLOBAL CHALLENGES

Growing number of chronic diseases,
Rising of life expectancy,
Lack of medical workforce,
Increasing amount of administrative tasks,
The cost of medical treatment....
Physician Burnout and Depression

- Burned out: 42%
- Colloquially depressed: 12%
- Clinically depressed: 3%

NOT ONLY IN HUNGARY!!

Burnout
<table>
<thead>
<tr>
<th>Source</th>
<th>Odds Ratio (95% CI)</th>
<th>Favor No Patient Safety Incidents</th>
<th>Favor Patient Safety Incidents</th>
<th>Weight, %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Egan et al., 2017</td>
<td>7.04 (4.86-10.12)</td>
<td></td>
<td></td>
<td>12.05</td>
</tr>
<tr>
<td>At Wernert et al., 2013</td>
<td>9.00 (7.14-10.85)</td>
<td></td>
<td></td>
<td>8.00</td>
</tr>
<tr>
<td>Fuhrekind et al., 2000</td>
<td>1.37 (0.65-2.80)</td>
<td></td>
<td></td>
<td>4.27</td>
</tr>
<tr>
<td>Gonzales-Gonzalez et al., 2015</td>
<td>2.12 (1.5-3.35)</td>
<td></td>
<td></td>
<td>6.03</td>
</tr>
<tr>
<td>Hoesen et al., 2015</td>
<td>1.37 (0.85-1.44)</td>
<td></td>
<td></td>
<td>5.95</td>
</tr>
<tr>
<td>Haywood et al., 2012</td>
<td>1.32 (1.46-3.10)</td>
<td></td>
<td></td>
<td>4.70</td>
</tr>
<tr>
<td>Kang et al., 2013</td>
<td>0.90 (1.04-2.60)</td>
<td></td>
<td></td>
<td>9.33</td>
</tr>
<tr>
<td>Klein et al., 2015</td>
<td>3.84 (1.42-12.32)</td>
<td></td>
<td></td>
<td>2.73</td>
</tr>
<tr>
<td>Kowit et al., 2016</td>
<td>0.35 (1.13-3.52)</td>
<td></td>
<td></td>
<td>3.32</td>
</tr>
<tr>
<td>Liner et al., 2005</td>
<td>1.07 (0.93-1.15)</td>
<td></td>
<td></td>
<td>4.92</td>
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<tr>
<td>Liu et al., 2011</td>
<td>2.95 (2.26-3.85)</td>
<td></td>
<td></td>
<td>3.88</td>
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<tr>
<td>O’Connor et al, 2017</td>
<td>2.91 (1.92-3.42)</td>
<td></td>
<td></td>
<td>5.56</td>
</tr>
<tr>
<td>Price et al., 2008</td>
<td>2.08 (1.42-3.02)</td>
<td></td>
<td></td>
<td>6.28</td>
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<tr>
<td>Quash et al., 2015</td>
<td>1.89 (1.06-1.55)</td>
<td></td>
<td></td>
<td>6.18</td>
</tr>
<tr>
<td>Shafirov et al., 2010</td>
<td>1.17 (0.95-1.02)</td>
<td></td>
<td></td>
<td>9.30</td>
</tr>
<tr>
<td>Weed et al., 2015</td>
<td>2.01 (1.27-3.10)</td>
<td></td>
<td></td>
<td>4.30</td>
</tr>
<tr>
<td>West et al., 2007</td>
<td>0.90 (1.05-1.27)</td>
<td></td>
<td></td>
<td>6.20</td>
</tr>
<tr>
<td>West et al., 2009</td>
<td>1.17 (0.92-1.51)</td>
<td></td>
<td></td>
<td>8.21</td>
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<tr>
<td>Subtotal (P = 0.57, 95% CI = 0.00)</td>
<td>1.61 (0.69-3.34)</td>
<td></td>
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<td>100</td>
</tr>
</tbody>
</table>

Electrolyte Imbalance

Hypothesis et al., 2002                  | 1.69 (1.64-2.43)    |                                   |                               | 9.12      |
Kang et al., 2010                      | 0.35 (1.03-4.50)    |                                   |                               | 4.26      |
O’Connor et al., 2017                  | 2.14 (1.42-3.29)    |                                   |                               | 5.55      |
Price et al., 2009                     | 2.03 (1.24-3.36)    |                                   |                               | 12.79     |
Shafirov et al., 2002                  | 1.84 (1.42-2.36)    |                                   |                               | 11.98     |
Weed et al., 2015                      | 2.43 (1.96-3.02)    |                                   |                               | 13.35     |
West et al., 2007                      | 2.91 (1.45-3.02)    |                                   |                               | 9.75      |
West et al., 2006                      | 1.07 (0.92-1.27)    |                                   |                               | 13.95     |
West et al., 2009                      | 1.64 (1.36-2.98)    |                                   |                               | 14.65     |
Subtotal (P = 0.13, 95% CI = 0.00)    | 1.71 (0.92-2.98)    |                                   |                               | 100       |

Dysfunction

Hypothesis et al., 2002                  | 2.72 (1.53-4.74)    |                                   |                               | 4.52      |
Kang et al., 2002                       | 2.85 (1.79-4.36)    |                                   |                               | 6.74      |
O’Connor et al., 2017                  | 3.17 (2.31-4.43)    |                                   |                               | 11.55     |
Price et al., 2009                     | 2.55 (1.47-4.43)    |                                   |                               | 10.04     |
Shafirov et al., 2009                  | 1.36 (0.85-2.18)    |                                   |                               | 10.89     |
Weed et al., 2013                      | 2.13 (1.12-3.91)    |                                   |                               | 12.57     |
West et al., 2006                      | 1.17 (1.03-1.33)    |                                   |                               | 12.99     |
West et al., 2009                      | 1.09 (1.01-1.17)    |                                   |                               | 13.03     |
Subtotal (P = 0.15, 95% CI = 0.00)    | 1.64 (1.25-2.18)    |                                   |                               | 100       |

Personal accomplishment

Hypothesis et al., 2009                  | 2.27 (1.34-3.82)    |                                   |                               | 15.34     |
Kang et al., 2013                       | 2.86 (1.45-5.52)    |                                   |                               | 5.98      |
O’Connor et al., 2017                  | 1.35 (1.00-1.84)    |                                   |                               | 4.91      |
Price et al., 2009                     | 2.06 (1.01-4.10)    |                                   |                               | 14.82     |
Shafirov et al., 2009                  | 1.17 (0.92-1.42)    |                                   |                               | 10.55     |
Weed et al., 2015                      | 1.99 (1.14-3.81)    |                                   |                               | 13.45     |
West et al., 2006                      | 1.56 (1.13-2.15)    |                                   |                               | 15.47     |
West et al., 2009                      | 1.08 (1.02-1.14)    |                                   |                               | 15.99     |
Subtotal (P = 0.14, 95% CI = 0.00)    | 1.49 (1.12-2.01)    |                                   |                               | 100       |

**JAMA Internal Medicine | Original Investigation | PHYSICIAN WORK ENVIRONMENT AND WELL-BEING**

Association Between Physician Burnout and Patient Safety, Professionalism, and Patient Satisfaction: A Systematic Review and Meta-analysis

Marica Pangrazio, PhD, Keith Geraghty, PhD, Judith Johnson, PhD, Anil Zhou, MD, Efthymia Parapoulopoulou, PhD, Carolyn-Olive Guillen, MD, David Piers, MD, Alexander Hoffenson, PhD, Ruth Kelley, PhD, Alessio Ercolani, MD, PhD

47 studies, 42,472 doctors

JAMA Internal Med October 2018

https://jamanetwork.com/journals/jamainternalmedicine/fullarticle/2698144
2017 CHICAGO: „I WILL ATTEND TO MY OWN HEALTH, WELL-BEING, AND ABILITIES IN ORDER TO PROVIDE CARE OF THE HIGHEST STANDARD.”
PRESENCE OF DIGITAL HEALTH

Cognitive Computing Application: “Medical Sieve”
Image anomaly detection and identification

- Quickly filters irrelevant images
- Highlights disease-depicting regions
- Multi-modal decision support
### Biological
- Gender
- Physical illnesses
- Disabilities
- Genetic vulnerabilities
- Immune function
- Medications

### Psychological
- Learning/Memory
- Personality
- Behaviours
- Emotions
- Coping Skills
- Previous mental issues

### Social
- Social support
- Family background
- Cultural traditions
- Socio-economic status
- Education

### Digital
- Digital expansion of biological self
- Digital engagement of patients
- Social networking

### Core Digital Health Categories:
- Electronic health records
- Online health info and reviews
- Mobile health tracking
- Wearable technologies
- Genetic services
- Telehealth and telemedicine
WHAT IS DIGITAL HEALTH?

• Digital health is defined as “the cultural transformation of how disruptive technologies that provide digital and objective data accessible to both health care providers and patients leads to an equal-level doctor-patient relationship with shared decision-making and the democratization of care.”

  • Meskó B, Drobni Z, Bényei É, Gergely B, Győrffy Z. Digital health is a cultural transformation of traditional healthcare. mHealth 2017;3:38.
PRESENT AND FUTURE: PARTICIPATORY MEDICINE
E-PATIENT MOVEMENT:
THE LETTER „E” CAN STAND FOR

• „electronic” (using digital technologies in their disease or health management),
• „equipped” (having digital health technologies at their disposal),
• „enabled” (having newly acquired access to information),
• „empowered” (by the loss of the ivory tower),
• „engaged” (taking an active part in their care), and
• „expert” (in using technologies in their care or health management)
Health services research
Research

What happens when patients know more than their doctors? Experiences of health interactions after diabetes patient education: a qualitative patient-led study

Rosamund Snow¹, Charlotte Humphrey², Jane Sandall³

Author affiliations →

Abstract
Objective To explore the impact of patient education on the lives of people with diabetes, including the effect on interactions with doctors and other healthcare professionals.

Design Qualitative user-led study using longitudinal interviews and 146 h of participant observation. Data were analysed using a narrative approach.

Participants 21 patients with type 1 diabetes, those either about to attend a patient education course or those who had completed the course in the previous 10 years.

Setting Established patient education centres in three UK teaching hospitals teaching the Dose Adjustment for Normal Eating (DAFNE) course.

Results Both postcourse and several years later, most participants spoke of the experience of taking part in education as life-changingly positive. It helped them understand how to gain control over a very complex disease and freed them from dependence on medical advice and restrictive regimes. However, interactions within the health system following patient education could be
WHAT EMPOWERED PATIENTS NEED: EMPATHY, TIME, AND ATTENTION
HOW COULD DIGITAL TECHNOLOGY MAKE AN IMPACT ON PRIMARY CARE?

THE RESPONDENTS

- 183 questionnaires from 37 countries
- 70% work in cities smaller than 1 million residents
- Mean size of practice was around 2,000 patients
- 42.6% of the respondents were women
- Age varies between 24-77, while the average age was 47.5
ATTITUDES TOWARDS DIGITAL HEALTH

75.4% eagerly uses digital health tech
20.8% hasn't adopted yet

TYPES OF DIGITAL HEALTH TOOLS PHYSICIANS USE

WHAT DO THEY WANT TO USE IN THE (NEAR) FUTURE?

- Social media (10.53%)
- Smartphone apps (15.07%)
- Health sensors (16.36%)
- Telemedicine (13.12%)
- Portable diagnostics (16.88%)
- Artificial intelligence (10.51%)
- VR/AR (9.44%)
- 3D Printing (9.08%)

General practitioners are not eager to use very futuristic or less comprehensible technologies.
WHY IS IT BENEFICIAL TO WORK WITH DIGITAL TECH?

- Higher patient engagement: 66%
- Faster access to care: 65%
- More efficient work: 61%
- Increases quality of care: 59%

Money doesn't matter. Only 14.2% of GPs mentioned digital tech would bring extra income.

WHAT COULD BE THE POTENTIAL NEGATIVE CONSEQUENCES?

The biggest fear of primary care physicians is patients misinterpreting their results. 70% of the respondents said it.

- Patients misinterpret their results: 70%
- Extra expenses for practices: 51%
- Overdiagnosis: 49%
- Increased administrative burden: 44%
WHAT DOES THE FUTURE HOLD?

76% think data analysis will be part of practicing medicine
For 70% of the respondents, the use of digital tech is inevitable in the future
Patients will be the point of care, says 69.9%
Medical decision-making will be a shared process between patients and their caregivers according to 61.8% of the surveyed GPs
THE RISE OF EMPOWERED PHYSICIANS

MESKO B, GYŐRFFY Z

THE RISE OF THE EMPOWERED PHYSICIAN IN THE DIGITAL HEALTH ERA: VIEWPOINT

J MED INTERNET RES 2019;21(3):E12490
ELECTRONIC

Uses digital technologies in their disease or health management.

Uses digital technologies in their practice with ease.
EQUIPPED

Has digital health technologies at their disposal (e.g.: wearable sensors).

Has digital health technologies at their practice (e.g.: live access to patients' data).
Enabled by their newly acquired access to data about their health.

Enabled by regulations and guidelines to use digital technology in their practice.
Empowered by the loss of the ivory tower.

Empowered by technologies that support their job and their e-patients.
E-NGAGED

Can take an active part in the decision making of their care.

Incorporates the feelings and views of their patients into the healing process.
E-XPERT

Knows how to use technologies in their treatment or health management.

Knows how to apply new technologies in their clinical practice.
STATISTICAL HIGHLIGHTS

We sent out more than 100 packages to 22 countries.

577 badges and/or pins arrived to

hundreds of medical professionals in 10 months.

Badges/pins per country

- Australia: 142
- Sweden: 128
- USA: 95
- Netherlands: 48
- Belgium: 16
- Hungary: 16
- South Africa: 14
- Canada: 14
- India: 13
- UK: 12
- Brazil: 10
- Finland: 6
- Singapore: 4
- United Arab Emirates: 4
- Germany: 4
- Pakistan: 4
- New Zealand: 4
- Greece: 4
- France: 2
- Argentina: 2
- Kenya: 2
- Turkey: 1
- Poland: 1
„THE DOCTOR TREATS, PERSONAL RELATIONSHIPS HEAL”