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Support for Managing Mental Health in the Digital World

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Introduction

Both the NHS and adult social care budgets are under extreme pressure due to the dual effects of an ageing population, and a rapidly growing incidence of chronic diseases. The latter are due, in part, to lifestyle choices such as smoking, binge drinking, a lack of exercise, and poor diet. This has led to commissioners having to make tough choices when allocating funding for some services. Mental Healthcare remains the biggest single item in the NHS budget. However, the overall spend is little over 10% of the overall budget and must deal with a disease burden which is approaching 25% of the whole. Services are therefore poorly resourced and face falling capacity at a time of rising demand, as shown in Figure 1; the King's Fund found that 40% of mental health trusts in England had seen their budgets cut during 2015/6.
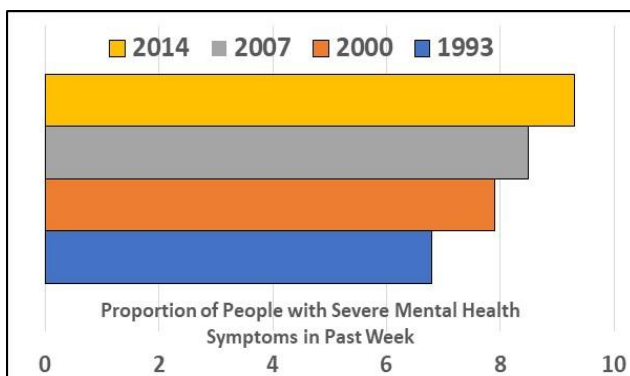

Figure 1: Increasing Trend in Mental Health Cases
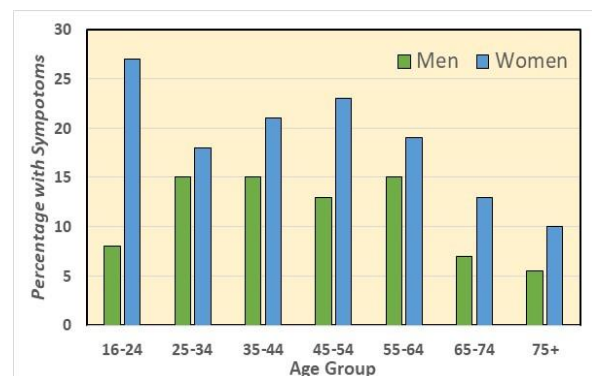

Figure 2: Age Dependence of Mental Health Issues

Despite an investment in 'talking therapies', the most likely form of treatment is medication. For example, the number of prescriptions for anxiety, depression, panic attacks and obsessive-compulsive disorder more than doubled in England from 31 million to 65 million between 2006 and 2016. Similar trends have been observed in Wales and in Scotland. More women suffer from these illnesses than men, especially as teenagers and in their early 20s, though the reasons for this remain unclear. Figure 2 shows the age profiles of patients for both sexes. It should be noted that these age profiles bear little resemblance to those of other long term conditions, which all show a prevalence which increases monotonically with age.

A consequence of mental health issues that is often overlooked, is the impact that they have on physical health. It follows that a failure to address the former, can lead to major issues concerning the latter. Figure 3 displays the possible links between mental health complaints and various parts of the body, though the effects vary significantly between individuals. For example, it has recently been shown that exposure to a stress-related disorder was significantly associated with an increased risk of subsequent autoimmune disease.
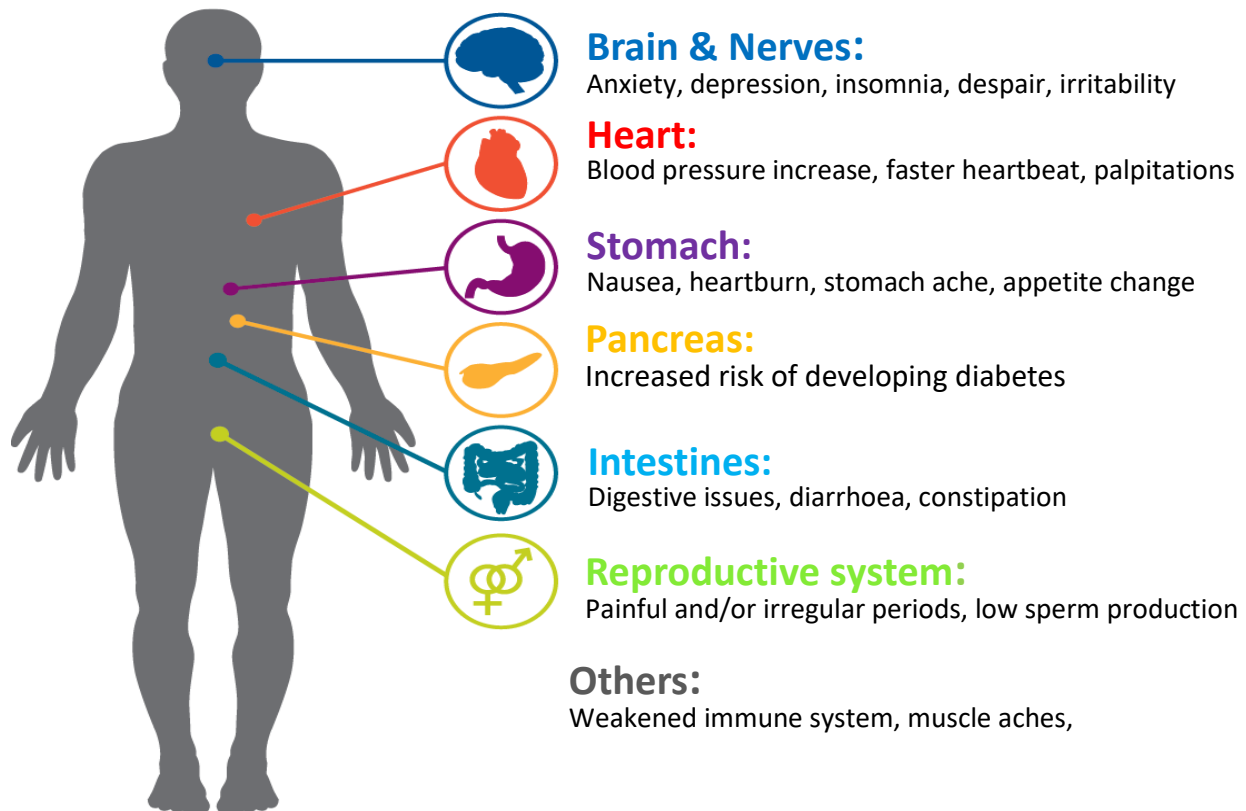
Brain & Nerves:
Anxiety, depression, insomnia, despair, irritability

Heart:
Blood pressure increase, faster heartbeat, palpitations

Stomach:
Nausea, heartburn, stomach ache, appetite change

Pancreas:
Increased risk of developing diabetes

Intestines:
Digestive issues, diarrhoea, constipation

Reproductive system:
Painful and/or irregular periods, low sperm production

Others:
Weakened immune system, muscle aches,

Figure 3: Impact of Mental Health Issues on Physical Health and Well-being

Types of Mental Illness

Table 1 describes the prevalence of a range of common mental health conditions, along with their description and comments. It should be noted that the prevalence refers to incidents in a given week. The overall prevalence of common mental disorders is 17%; this is because some people have multiple conditions.

Table 1: Common Mental Disorders

Condition	Prevalence	Comments
Generalised anxiety disorder	5.9%	Regular uncontrollable worries about different things
Depressive episode	3.3%	Long-lasting low mood that affects everyday life
Phobias	2.4%	Extreme fear triggered by particular situations
Obsessive compulsive disorders	1.3%	Repetitive activities to reduce anxieties of obsession
Panic disorders	0.6%	Exaggerated response to danger, stress or excitement
Post traumatic stress disorder	4.4%	Follows involvement in traumatic events
Mixed anxiety and depression	7.8%	Includes some vegetative symptoms such as tremors
Psychotic disorder	0.7%	Different perception of reality compared with others
Bipolar disorder	2.0%	Enormous swings in mood from highs to lows
Antisocial personality disorder	3.3%	Attitudes, beliefs and behaviours cause life problems
Borderline personality disorder	2.4%	Difficult thoughts/feelings about oneself and others

Not included in Table 1 as a common mental disorder is stress. It isn't actually a psychiatric diagnosis, though it is closely linked to mental health. It has no formal medical definition, perhaps because professionals are not agreed on whether it may be the cause of mental health problems or the result of them. What is clear is that stress can make existing problems worse, and that managing the causes of stress can help overcome other physical and mental health issues. A good starting point is therefore to identify the triggers to stress, and to develop strategies that can be utilised when the triggers start to appear. This involves building emotional resilience, including understanding feelings of sadness, to prepare for dealing with those demanding circumstances that might otherwise become overwhelming. Such approaches can break a vicious circle.

Stress at work is a leading cause of illness and loss of working days. Over a quarter of the workforce take at least a day off from work every year as a result of stress. Managers are most likely to be affected. Some leading causes of stress-induced days of illness in the workplace are described in Table 2, but they are often reported as incidents of physical illness. There could be many reasons for this, as shown in Figure 3. In particular, stress often leads to poor sleep quality which, in turn, causes both emotional stress and the release of hormones such as cortisol and adrenaline, both of which can have adverse health consequences over the longer term.

Table 2: Causes of Stress in the Workplace

Factor	Percentage affected	Comments
Workload	40	Staff can be overloaded by management attempts to increase productivity, or to compensate for absent colleagues
People issues	28	Individuals may be involved in disputes with colleagues, or may be subjected to threats and bullying
Work life balance	20	Workers can feel that they are neglecting their families and friends in order to spent more time at work or taking work home with them
Financial insecurity	6	Trying to meet targets adds pressures especially when linked to financial bonuses that supplement otherwise low pay

Although depressive episodes only affect 3.3% of the population at any one time (see Table 1), when coupled with anxiety, depression has become one of the biggest threats to well-being, leading to tearfulness, poor concentration, fatigue, loss of libido, and feelings of isolation. Depression can affect anyone at any time, but can be triggered by different factors such as:

- Concerns about physical or mental health, including a recent diagnosis or test,
- Bereavement, especially of a close family member or friend who was a companion or carer,
- The ending of an intimate relationship,
- An accident or injury that can prevent someone from going out and socialising;
- Debt or other financial issues,
- Changes in work patterns, including relocation or retirement, or
- A loss of self-esteem or role in some sporting or social activity.

The number of people suffering from anxiety or depression is so great that new management strategies are required, that don't rely on medication and frequent, expensive visits to therapists.

Assistive Technologies

Assistive Technology (AT), often referred to as equipment, is an umbrella term for any device, system or arrangement that facilitates individuals or groups to:

- perform a task that they would otherwise be unable to do,
- enhances their experience, or
- increases the ease & safety with which the task can be performed.

They are considered by many to be essential to enable people with disabilities to perform tasks for themselves, thus increasing their self-esteem & independence.
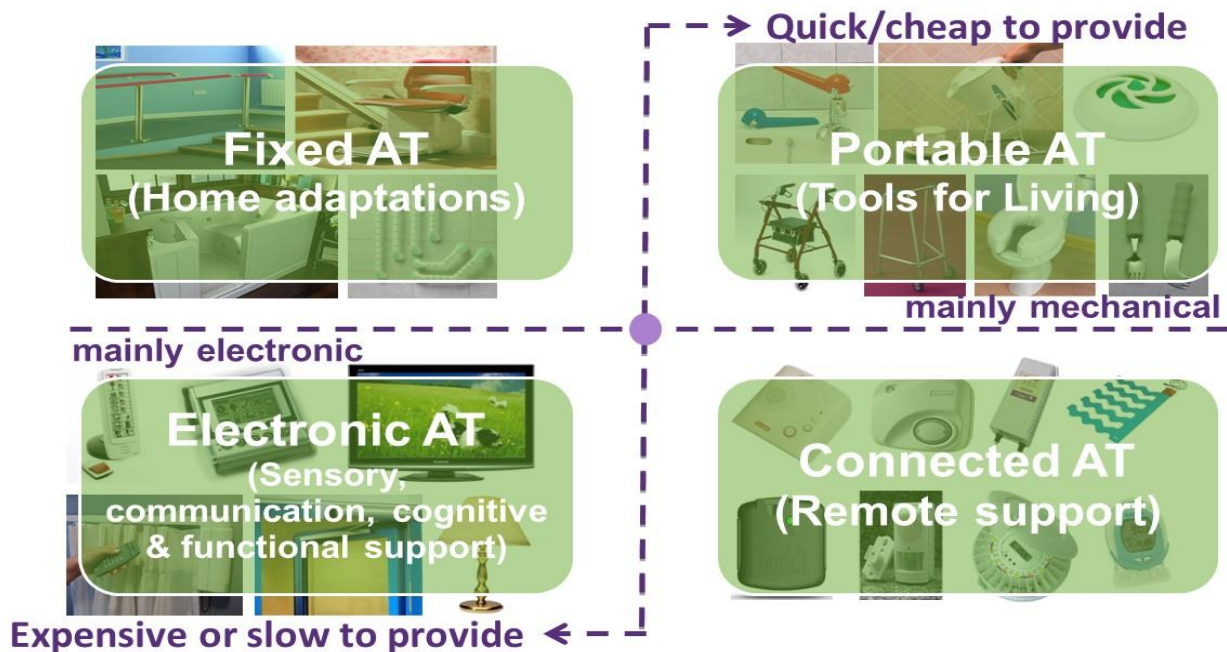

Figure 4: The Four Pillars of Assistive Technology

There are 4 groups (or pillars) of AT shown in Figure 4 – fixed, portable, electronic and connected AT respectively. The first two of these are generally low-tech and mechanical, involving either modifications to the living, or working environments, such as adapted bathrooms or lifts, or smaller devices, such as a cane, that can be carried as a mobility aid, or deployed anywhere. Electronic AT covers a wide range of devices and systems that can mitigate the issues that arise due to disability through often specialist devices, interfaces or actuator devices that can enable people with major physical or sensory deficits to live more independently. They are generally expensive (and slow) to provide because of the need to match the specification to the assessed needs of the individual.

Connected AT is a relatively new group which recognises the role of both wired and wireless technologies in connecting people and devices to remote carers or to organisations that can provide 24/7 support as appropriate. It includes telecare systems that have developed as an extension of social alarms which link over 1.5 million mainly older people to services that can ensure that there is an appropriate response to emergency situations. Telecare systems are now undergoing a digital transformation that is slowly replacing mainly telephone based devices that were part of an old analogue approach to communication with smarter systems. These include machine to machine messaging, cloud storage, data exchanges, and the emergence of larger, geographically dispersed monitoring and coordination centres where protocols involve responding to alerts rather than alarms as part of a predictive and preventive approach to supporting independence and well-being.

Smart, Digital Personal Assistive Technologies

The emergence of electronic devices with built-in intelligence and wireless communications through wi-fi, mobile telephony (3G, 4G and 5G), Bluetooth and other 'smart home' links such as Zigbee, Thread, Z-Wave and KNX, has enabled applications for connected AT to mushroom in recent years. In particular, it has allowed consumer-grade electronic devices to become '*smart*' and to extend their reach into disability markets. This is in addition to supporting older people who may experience natural decline in their ability to perform Activities of Daily Living (ADLs) such as bathing and feeding, and Instrumental Activities of Daily Living (IADLs) such as using the telephoning, doing their laundry, and managing their medication.
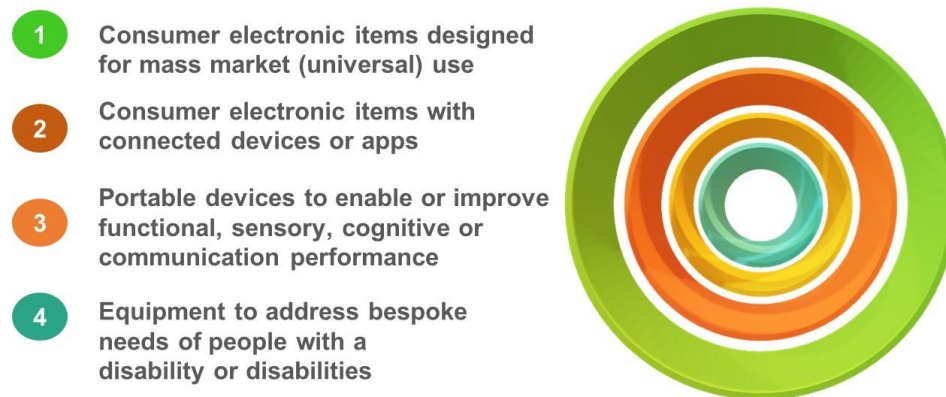
1. Consumer electronic items designed for mass market (universal) use

2. Consumer electronic items with connected devices or apps

3. Portable devices to enable or improve functional, sensory, cognitive or communication performance

4. Equipment to address bespoke needs of people with a disability or disabilities

Figure 5: Layers of the Smart Assistive Technology (SAT) Target

The result is that devices such as mobile phones, tablet computing devices, personal voice assistants/interfaces, wearable fitness and sleep trackers, and domestic appliances such as fridges and washing machines can become platforms for support. This includes providing timers, reminders and instructions to their owners, or to their family carers. It follows that they enable applications that make other devices, designed specifically for AT purposes, to become redundant. The smart phone can, in particular, provide specific support for people with sensory impairments, and in a form that is entirely portable. The benefits are not only a significant reduction in cost, but also the removal of the stigma that can discourage use by disabled people. Table 3 gives examples of applications of smart assistive technologies in each of the four layers shown in Figure 5.

Table 3: Smart Assistive Technology Devices and Systems

SAT Target Layer	Description of layer Items	Examples
1	**Consumer electronics**	Smartphone, tablet, laptop, fitness tracker, smart TV, voice interface/hub, smart appliances, games console, smart meter, cameras, electronic picture frame/clock, robotic cleaner/mower
2	**Consumer electronics with connected device**	Weighing scales, fitness mat, smart watch, motivational apps, glucometer, blood pressure monitor, balance board, smart bed, Bluetooth speaker, pressure switch, smart door bell/intercom, medication reminder/dispenser, activity monitors, sleep tracker, smart toothbrush, reminder tags, home hub
3	**Portable AT devices**	Hearing aid, smart spectacles, GPS backtracker, smart walking stick, speech pad, reminder watch, OwnFone, wearable sensors, mood ring, smart clothing, smart cutlery, therapeutic devices, orthotics
4	**Complex AT**	Profiling bed, exoskeleton, robotic feeding device, environmental control systems, brain interface devices, smart home systems

The Role of Smartphones

Although the primary purpose of all phones is to enable speech communication between people at a distance, the intelligence and sensors – including microphones, cameras, GPS location chips and wifi - embedded with a modern device allows them to be effectively repurposed to support an ever-growing range of needs. This is mainly by running one or more apps (small software applications) that can be personalised to support an individual's lifestyle and needs, and with simple interfaces, including touch-screen control. A smartphone has become ubiquitous, and their operation is normal (rather than stigmatising) in all developed countries. There is therefore considerable benefit in using apps and a smartphone to support mental health needs, using prudent healthcare principles. Even in poorly developed countries, where mobile phone use has increased exponentially during the past decade, the most basic mobile devices can add value.
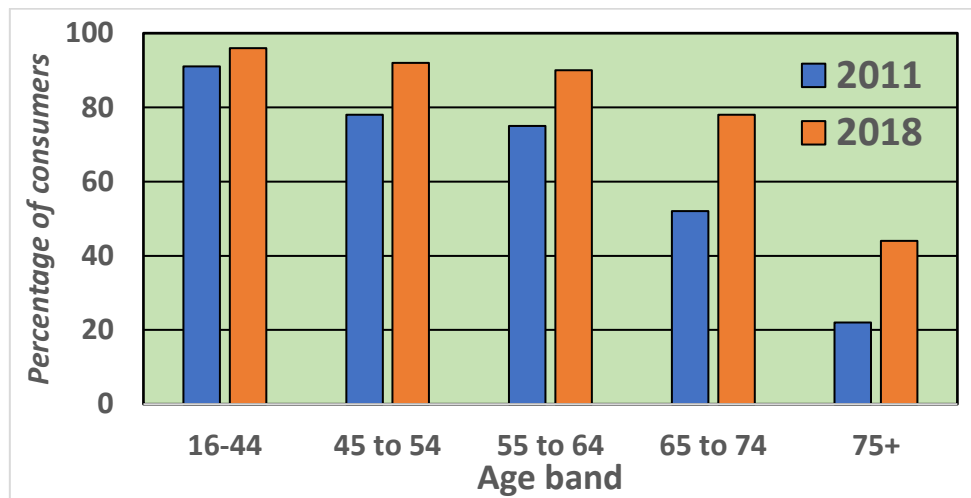

Figure 6: Use of Internet by Age Group

The role of technology in addressing mental healthcare needs, as well as other more general requirements for education, entertainment and communication, is highly dependent on access to the Internet and to other resources that are stored in the cloud. Office of National Statistics data show that recent use of the Internet increased to over 90% of adults by 2018 with only 8.4% claiming never to have used it. Non-users are generally assumed to be older people as shown by the changes between 2011 and 2018 in recent use age profile shown in Figure 6. It may be observed that nearly all people under the age of 45 now use the Internet frequently. The reluctance of people aged over 67 to use technology is often associated with their reluctance to accept digital transformation, and a fear of new technologies. Digital exclusion is often cited as a major obstacle that limits opportunities to introduce technology enabled support and monitoring services for older people that have the potential to improve their health, well-being and quality of life.

Only 8.4% of adults have never used the Internet though this includes 20% of disabled adults.

The penetration of digital devices among UK adults over the past few years shows contradictory trends for laptop, tablet and smartphones, as shown in Figure 7. Both ownership (and use) of laptops and tablets has started to level off at about 75%, while the use of the former has hardly increased over a period of 6 years. Some of these changes may be explained by the monotonic surge in smartphone use. Some of the increase may be due to the increasing capabilities of these devices, many of which are now able to perform the same functions as tablets and of laptops. It might also be relevant that 'dumb' mobiles are becoming something of a rarity.
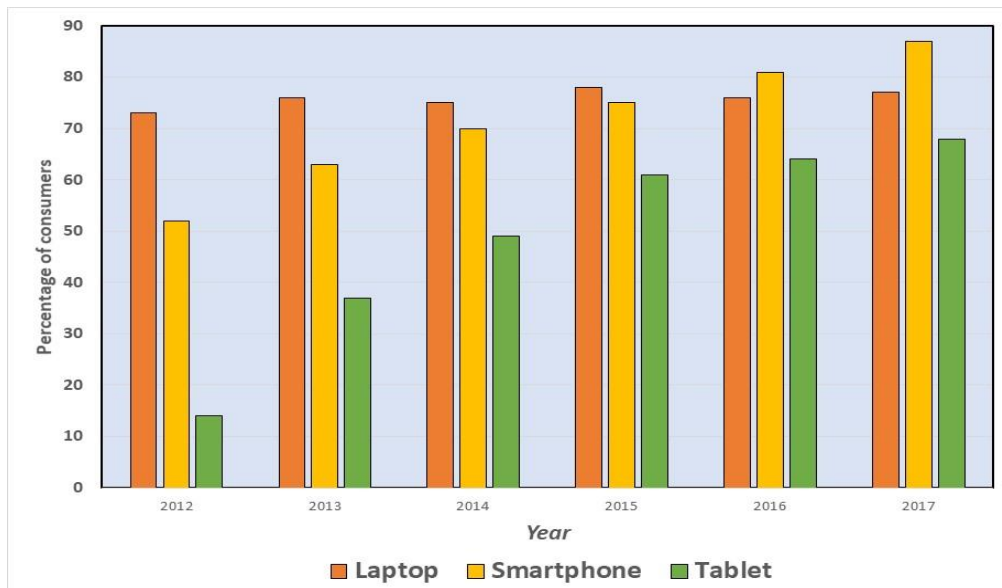
Figure 7: Device Penetration Amongst UK Adults between 2012 and 2017

Figure 8, based on data from the Deloitte Global Mobile Consumer Survey in June 2017, shows that penetration of smartphones amongst people aged over 55 remains the lowest, but has more than doubled during five years. More striking is the fact that ownership amongst 16 to 24 year old is nearly 100%, and is about 90% for the bands between 25 and 45.

The significance of the smartphone data is that smartphones, and access to their friends, social media and sources of information are almost ubiquitous amongst the people who are at greatest risk of developing a mental health issue. Most users have access to them at all times, including when they are in bed at night. They are therefore ideal platforms for enabling people with mental health problems to use their smartphones as a potential therapist and as a means of monitoring their status using the in-built sensors, voice and call patterns, and multimedia apps as sources of rich data for ongoing analysis and support. As an example, the Mobilyze! System uses 38 smartphone sensor values alongside user responses and other inputs to measure (and predict) psychological status. It can then deliver appropriate interventions for unipolar depression. Current research focuses on using location, voice analysis and measurements from wrist-bands to gauge sleep levels and activity profiles as further inputs for evaluating and treating mental health issues.
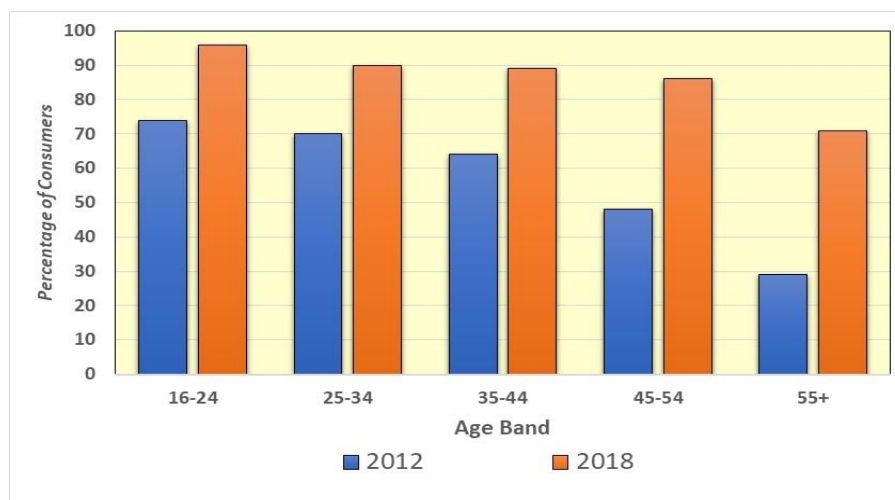

Figure 8: Penetration of Smartphones for People of Different Ages in the UK

Apps to Support People with Mental Health Issues

There are hundreds of thousands of apps currently available that aim to help people or professionals either to deal with specific ailments or to improve their self-care capabilities. Generally, their use has varied from those that people can rely on every day of their lives through to those that are used once only and then forgotten about. Unfortunately, there are also a great many that are inappropriate as they offer wrong or potentially dangerous information, or they have poor data security that would enable hackers to obtain personal information from them. As many of these apps are freely available to download from one of the proprietary App Stores, they can be easily accessed by members of the public, who might then not realise their limitations and effectiveness. It is apparent that there is a need for greater vigilance and for a level of curation and testing so that both users and prescribers can have the confidence to use or recommend options.

Several organisations, such as Orcha, have offered professional accreditations for apps; these typically involve testing features such as usability, security, limitations for use and value for money that are considered in reviews of hardware devices (such as through T-Cubed's established Vivo evaluation framework), and when endorsement or accreditation are possible. However, this approach may not be useful for apps because the majority of those available are free of charge; this means that neither the developers nor the distributors are in a financial position to fund such work. Therefore, alternative testing approaches are needed.

Two organisations lead in this work in the UK. One is myhealth apps (http://myhealthapps.net/) which claims to bring together the world's favourite healthcare apps – tried and tested by consumers – and supported by a group of organisations and partners shown in Figure 9, and the NHS Apps Library currently in a beta release - https://apps.beta.nhs.uk/

Figure 9: myhealth apps partners and research collaborators

Myhealthapps.net

The myhealthapps.net approach, managed by PatientView, is based on recommendations for apps by appropriate healthcare communities internationally, and involves:
- empowered consumers
- patients
- carers
- patient groups
- charities and other not-for-profit organisations,

in an effort to bridge the gap between the public (represented by the groups above) and the app developers. This enables the latter to improve the content, relevance and usability of apps so that

quality, impact and trust in apps can be improved. Patient/user groups can submit apps for inclusion directly via the website. PatientView confirms reviews from over 100 professional bodies and other information before uploading details to the site.
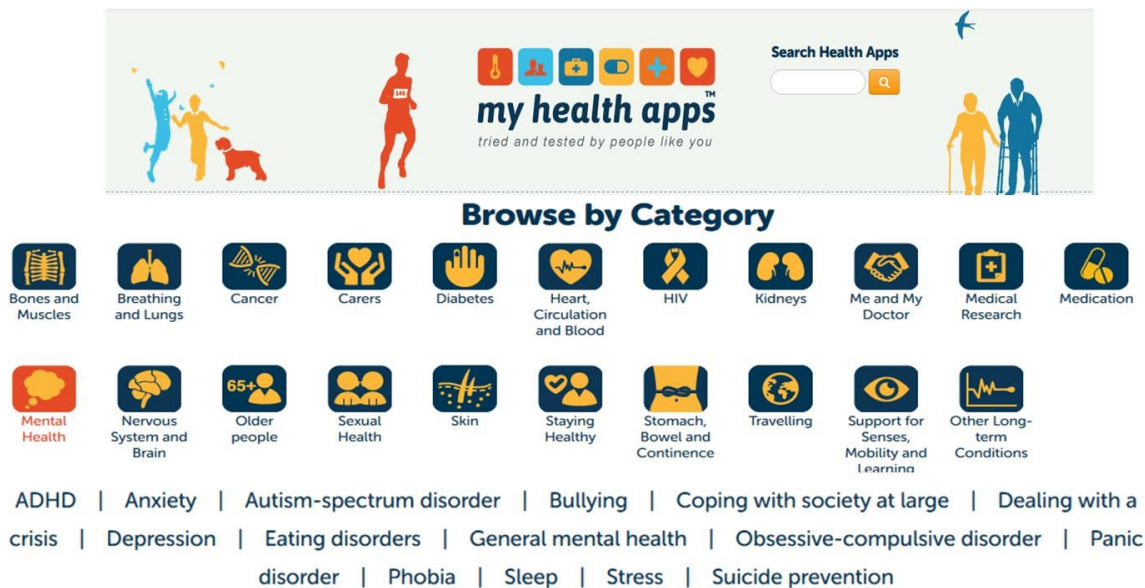

Figure 10: App Classifications Focusing on Mental Health

Apps may be classified in many different ways, depending on how they are used. From a self-care perspective, and recognising different perceptions of risk, myhealthapps.net separate apps into three classes broad classes, though many of the apps will feature in more than one class:

- **Disability** — these are apps that enable people to cope with daily living and provide support to people with any type of disability, including physical, mental and sensory impairment.
- **Health, wellbeing and care in the community** - these apps include most lifestyle apps, and allow individuals to manage their health and care support without the need for medical assistance; and which do not result in clinical decision-making by the user, or require input from a health professional.
- **Medical apps -** these involve clinical decision-making, diagnosis or treatment.

The mental health apps are further classified into 15 different sub-groups under which recommended apps are displayed in the form shown in Figure 11. Many of the most popular apps appear under many of these sub-groups. Each display shows the availability for different operating systems, the cost, and the relevant languages, along with one or more comments by reviewers.

Figure 11: The Display for Beat Panic Under Anxiety and Mental Health Apps

There are 23 apps displayed under the Anxiety heading. One of these is Beat Panic as shown in Figure 11. Table 4 shows some of the most popular Mental Health apps, and the sub-categories where they are displayed, and some comments.

Table 4: Some Popular Mental Health Apps on myhealthapps.net

Name	Symbol	Price	Categories	Comments
Anti-stress Chromo -therapy		Free	Anxiety Stress	App intended to reduce stress by demonstrating the therapeutic value of 256 shades of colour.
Big White Wall		Free (sign up required)	Anxiety Coping with society at large Depression General mental health Panic disorder Stress	Provides advice helpful to people with anxiety, debt, stress, or work problems.
CBT Keeper		Free, but upgrade for ads removal is £1.27	Anxiety Depression	App that relies on cognitive behavioural therapy (CBT) to help the user overcome anxiety and depression.
MindShift		Free	Anxiety Panic disorder Stress	Aims to help teens and young adults cope with anxiety
Mood Diary		Free	Anxiety General mental health	App to help people to monitor and manage their mental health
MoodKit		£3.99	Anxiety Coping with society at large Depression Stress Suicide prevention	A means by which people with anxiety or depression can improve their mood.
PTSD Coach		Free	Anxiety Depression General mental health Panic disorder Stress	App designed to help people with Post Traumatic Stress Disorder to manage their condition
StressHeads		Free	ADHD Anxiety Stress	App aimed at 16-25 years olds to help them manage stress, and identify what triggers it.
MyTalkTool Mobile		£64.46	Autism-spectrum disorder Learning disability	Allows user to communicate through audio, images, symbols, video by touching image, which app reads out
Living Safely		£22.95 (iOs only)	Health, Wellness & Care in Community	Uses illustrations to teach about personal/home safety e.g. electrical and medicines

The NHS App Library

Originally launched as a pilot in 2013, the NHS Apps Library was forced to close down in October 2015 as a result of NHS-approved apps being found to leak data. It has now been relaunched as a Digital Apps Library, with tested data security features, though still in Beta form. The vision remains for the library to host leading healthcare apps so that they are accessible and trusted by members of the public. Users are able to filter apps by categories - cancer, COPD, dementia, dental, diabetes, healthy living, learning disability, mental health, online community, pregnancy and baby, and other. The 16 apps that are included under Mental Health are shown in Figure 16. Some are labelled as currently being tested in the NHS while others have already been tested in academic or other user trials.
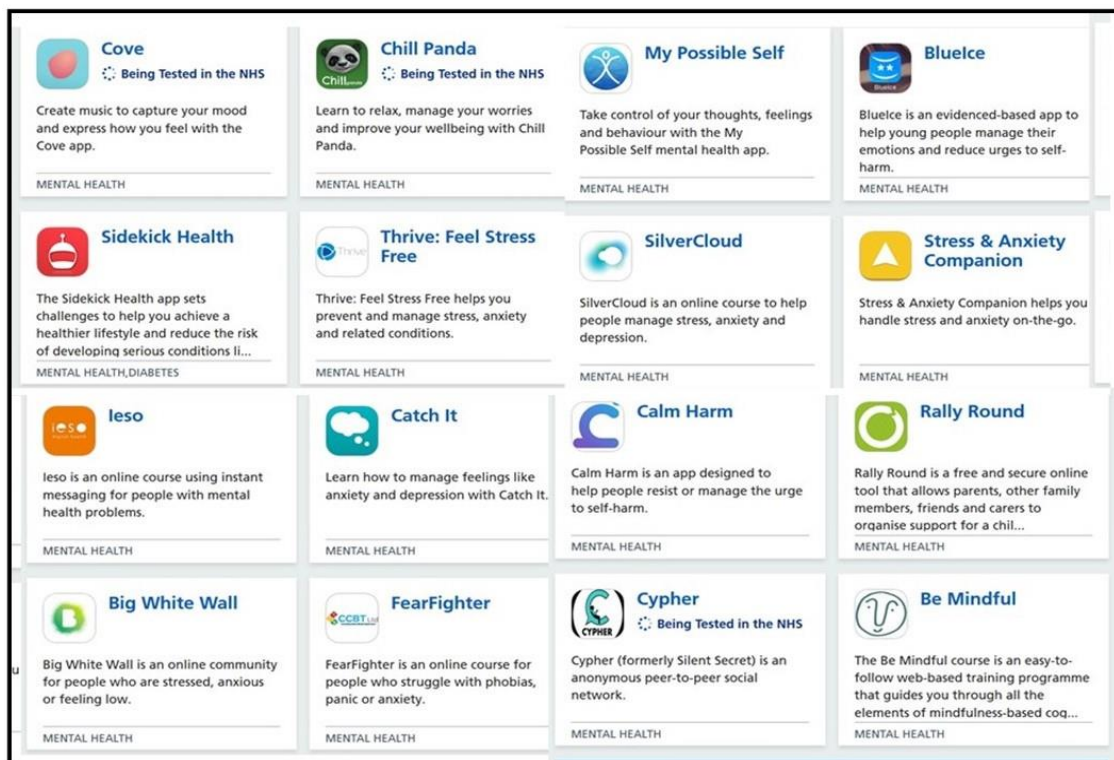

Figure 16: The Mental Health Apps in the NHS Apps Library

Each one of these apps is described in a standard, easy to understand manner using the format shown in Figure 17. It includes details of how to access the app. This may be through the respective apps stores operated by Apple and Google, but, in some cases, only through the developers.
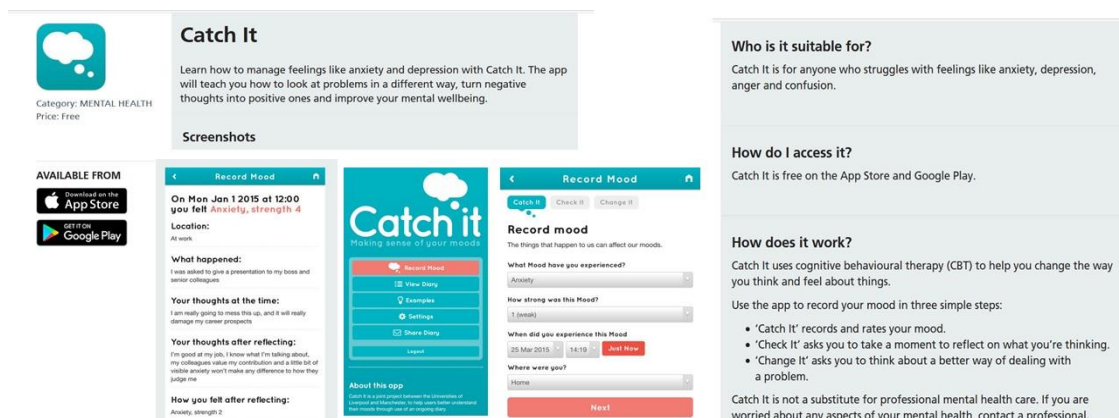

Figure 17: The information Available for the Catch It App in the NHS Apps Library

Apps and Hardware to Manage Stress

Although smartphones have several sensors that can measure some physiological parameters, these are not available on a continuous basis, nor do they yet enable accurate measurement of activity levels, heart-rate and blood pressure. However, when linked wirelessly to a worn device, apps can allow long term monitoring of a wide range of parameters. If the device can be worn day and night (and if the battery has the capacity to keep the device running for several days without the need for a lengthy recharge), this combination of hardware and smartphone app can become a powerful means of giving users access to their own data. This, in turn, enables feedback to be applied so that the user can monitor and control their own feelings and stress levels whenever necessary. Some apps enable meditation techniques to be applied, without the need for hardware. Table 4 compares four different apps that are relevant to stress release.

Table 4: Apps and Devices to Provide Relief from Stress

Name	Access	Cost	Hardware	Description
InterAxon Muse	https://store.choosemuse.com/products/muse	£229 (for Brain-sensing headband)		EEG neurofeedback technique helps with understanding calm or active mind
PIP device	https://thepip.com/en-eu/	£159 (for Electro dermal sensor device)		Monitors stress at fingertips and provides visual and auditory feedback for control
Calm app	https://www.calm.com/	$4.99 per month (annual subscription) or $299 (lifetime)	None	Teaches meditation and breathing to relax mind and body, by listening to calming stories or music or watching soothing nature scenes
Headspace app	https://www.headspace.com/	£5.99 per month (annual subscription) or £299 (lifetime)	None	Daily 10 minute guide helps focus and release anxiety to form a beneficial habit. It has 100s of themed sessions for reminders and practising weak points

It should be noted that these approaches are all based on a professional model; some provide a free app but with a charge for the required hardware, while others operate a subscription model. The lifetime costs are similar, so individuals and organisations need to choose between having bespoke hardware as an interface, or to rely on the app. The benefits are most obvious if used at times of high stress which the hardware devices can monitor, especially if used in conjunction with a wrist-worn activity tracker that can provide continuous measurements of pulse rate, for example.

Figure 18 shows the author's activity pattern for a day while wearing a Fitbit Versa watch and using the PIP device and app every 15 minutes. The former provides a continual monitoring of activity level, number of steps taken during that period, and the heart rate. The latter provides a measure of stress based on changes in skin conductivity. It may be observed that activity can increase at certain times of the day, and in response to factors such as work issues, but can then be moderated by going for a walk, having a drink or by relaxing through listening to music or reading.
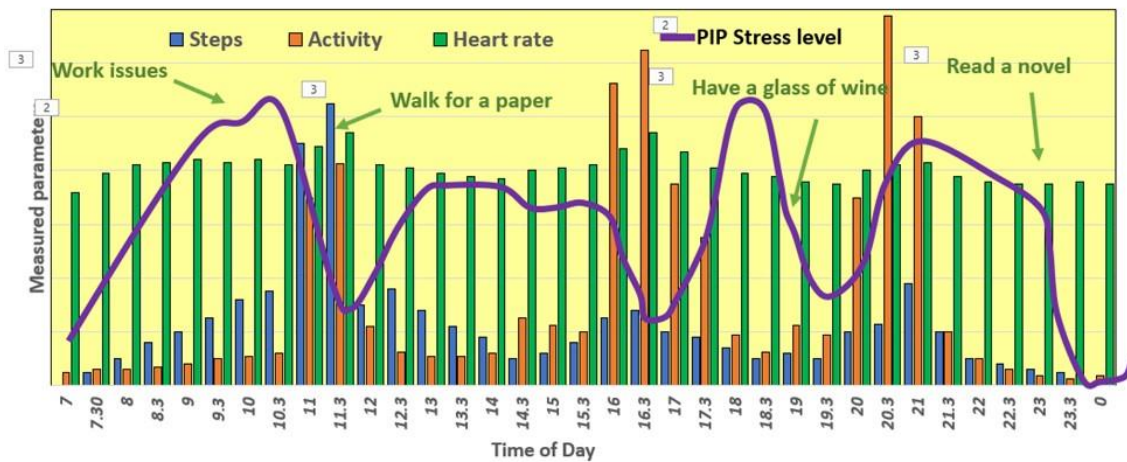
Figure 18: Activity and Physiological Parameter Profile of an Individual Using a Fitbit and PIP

The Pip device couples with its apps to give immediate feedback on stress levels. The app offers a number of different options including one that shows a winter image that the user needs to transform into summer by holding the device between the thumb and index fingers while it measures skin conductivity for a few minutes. The longer that the stress levels are kept low, the faster the scene changes. Long term use enables users to employ meditation and mindfulness to manage their stresses at any time and in any place.

Apps for People on the Autistic Spectrum

The development of social skills are critical to later success in adult life. Most children are able to build these skills and experiences by interacting with their family members and with their friends. However, some students, especially those who are diagnosed with autism spectrum disorders (ASD), struggle to deal with these aspects of life. Unless they receive additional teaching and interventions, they grow up finding it hard to develop relationships and to communicate effectively in the workplace. It is evident that the outcomes are best when interventions take place at an early age, and as part of the education process, though the evidence from research remains weak. Fortunately, technology is enabling new approaches based on apps to enter into the classroom and others that can be used in the home.

There are dozens of resources that list examples of apps including coordinated efforts in some countries to use the Padogogy Wheel approach to providing such information. One of the best known is *Apps for Students with Autism Spectrum Disorders v.4* shown in Figure 19 by Mark Coppin (https://www.dropbox.com/s/336tv4jsofn7gcm/Apps%20List%20V4.pdf?dl=0#). It offers 10 or more apps, in 6 different domains – Communication, Social Skills, Need for Sameness or Routine, Sensory Sensitivity, Difficulty with traditional Learning Methods, and Behaviour. The wheel extends outwards from a core of common learning characteristics through Common Learning Traits to App Categories before providing some examples of apps that can provide an appropriate starting point. Other apps can then be deployed to build on developing skills or for personalisation through the learning process.
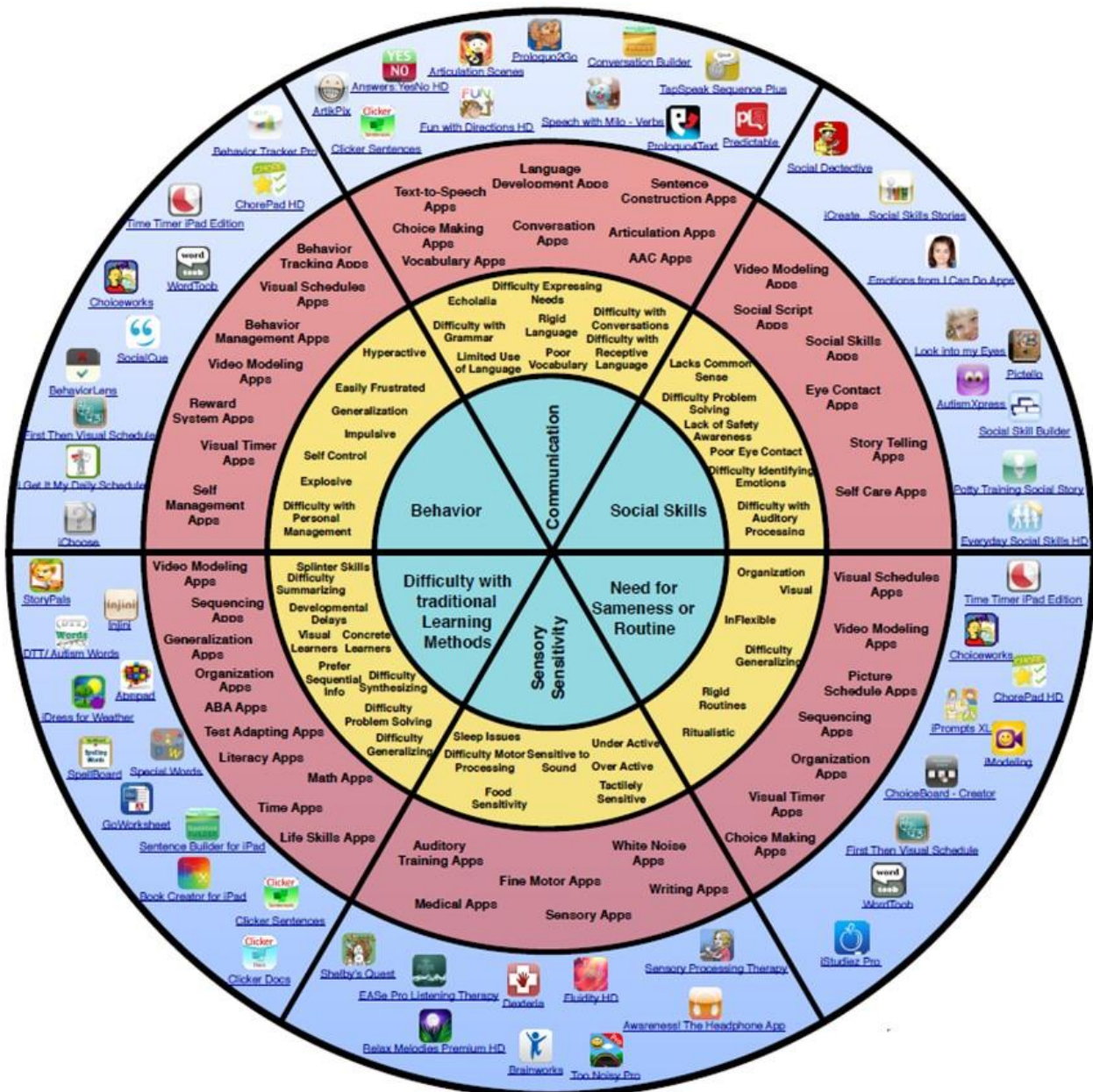
Figure 19: Apps for Students with Autism Spectrum Disorders (version 4 – 2016)

One of the more advanced apps, which operates commercially in the UK , is Brain in Hand (http://braininhand.co.uk/) . It offers personalised support when and where it's needed, using the app on an individual's own smartphone. A diary, notes and reminders are held on the app to ensure that important events are not forgotten. It also provides coping strategies to help reduce anxieties. The traffic light system shown in Figure 20 (left) help to monitor levels of anxiety and to request additional help by pressing the red button that appears on the phone's screen. It also offers a really simple timeline for ensuring that support is coherent (see right of Figure 20). It is currently being made available in some areas through local authority or NHS contracts. However, it can be purchased privately by individuals for £49 per month, which can be part of a personal care budget when appropriate. A fee of £280 is charged as a typical one off payment for setting up the app initially and for helping the individual get started. This is based on a need for perhaps 4 one-hour sessions either face-to-face or over the telephone. Long term mentoring services are also available at £50 per month.
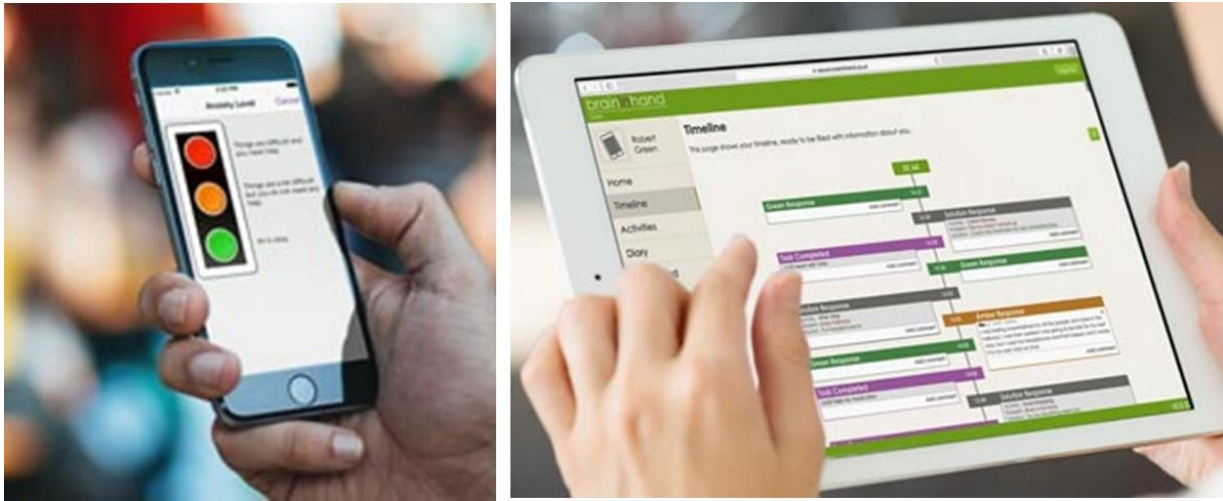
Figure 20: Screens from the Brain in Hand App

Apps within a Managed Service

Few local authorities, NHS organisations, nor telecare and community service providers have yet developed operational models that deal adequately with the challenges posed by digital transformation. These include:

- Assessments that identify the best app to meet the needs of the individual rather than restricting the inventory to a small number of hardware devices;
- Having experience and expertise in the application and efficacy of apps;
- Understanding the hardware requirements (including operating system) to operate the app appropriately on a smartphone;
- Downloading and installing the app, and setting up a secure account;
- Setting up personal features for alerts and/or for dash-board;
- Providing on-going support to deal with maintenance issues, including transferring the app to a new phone if the original device is lost or replaced; and
- Having protocols in place at a 24/7 monitoring centre to deal with exceptions and alerts in a non-judgemental manner; and
- Having community and volunteer responders in place who have been appropriately trained to manage the issues that may arise at some stage.

It follows that these products need to be the subject of more robust evaluation by independent experts with the appropriate digital skills and experience of telecare services, so that they may be prescribed with confidence by assessors. This would suggest that the training courses currently available in this space, and often delivered by supplier companies rather than by teams with broader experience, need to be improved and accredited by universities or other appropriate agencies.

Conclusions

Mental health technology applications are now plentiful and sufficiently mature to play an important role in dealing with many of the issues faced at some time by a significant percentage of the population. More robust trials and training may be required.

Acknowledgement

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