

# Obesity care and the promise of digital health

A Kry Livi report



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# The complexity of obesity

Foreword by Lukas Didon, Vice President, Commercial & Partnerships



Obesity is often misunderstood as a personal choice which ignores the many medical, genetic, mental, environmental and emotional factors involved.

To put it simply, it's complex. And as with anything multifactorial in nature, it needs to be talked about in depth and honestly.

That's exactly what we're doing here at Kry. This paper is reflective of a continued commitment to fostering constructive, open dialogue on chronic diseases such as obesity with the healthcare system and our global partners.

I believe that, for too long, meaningful discussion and debate about tackling obesity have been undermined by stigma attached to it. That stigma often means people avoid seeking medical care which can delay prevention or treatment.

Left unchecked, obesity puts an enormous strain on healthcare systems around the world. It affects the health and wellbeing of populations, productivity of nations and capacity of healthcare providers. At a time when the system needs to do more with increasingly less, we need to change the way we address it. And it requires long-term solutions, not one-off fixes.

The current system of episodic care is not working. We need to think about how we treat obesity as part of a long-term care management relationship. Here at Kry, we're taking action. We're looking to digital's full capabilities to help build a more resilient healthcare system for the future.

We know chronic disease areas like obesity require repeat appointments and continuous care. As such, digital can help connect the dots and ensure that patients can access treatment without costly interventions and complex navigation.

We're already seeing the impact of digital in connecting the dots in primary care and enabling quick and flexible access to a GP with over 8 million patient appointments delivered across Europe by Kry so far.

**But we're not stopping there.** We recognise obesity requires a holistic approach to treatment. Just as obesity can arise due to a combination of different factors, our treatment plans span many different touchpoints of a person's health journey.

Our long-standing and successful obesity programme, first launched in Sweden and now extending across Europe, is unique in its close engagement with patients over time to build long-term healthy habits. Our digital-first and novel care pathways comprise of many elements – combining access to clinical expertise and support for diet, exercise, wellbeing and mental health, with a total focus on patient outcomes.

This paper explores the benefits some of these digital components can have within a holistic obesity care pathway. Looking at external clinical evidence, we examine the impact digital health can make in removing barriers to treatment, increasing access and driving engagement and adherence, so individuals can achieve long-lasting behaviour change. And along the way you'll hear more about our global obesity programme too.

There is no single blueprint to tackling obesity, but awareness and access to healthcare along with provision of accurate, tailored health information are some key parts of the puzzle. Digital can be the enabler.

And while obesity may be complex, our aim is simple - to work in close collaboration with our partners to improve obesity treatment. If we can achieve that, we'll achieve better healthcare for everyone.

# Introduction

Obesity is one of the biggest challenges facing healthcare systems today. Worldwide, the prevalence of obesity has nearly tripled since 1975 and an estimated 13% of adults are obese.<sup>1</sup> By 2035, it is predicted that half the world's population will be obese or overweight.<sup>2</sup>

Obesity is linked to a range of long-term health conditions and can increase risk of diabetes, heart attack and cancers. It is also associated with increasing the likelihood of hospital admissions.

In Sweden, the total cost of obesity was €2.7 billion in 2016.<sup>3</sup> In France, this figure was estimated to range between €2.1 to €6.2 billion in 2002, accounting for between 1.5 and 4.6% of total health expenditure.<sup>4</sup>

In the UK, obesity is said to cost the NHS £6 billion a year.<sup>5</sup> While a recent study reports that the NHS spends £1,375 annually on average on morbidly obese patients, almost double the cost of individuals at a healthy weight.<sup>6</sup>

Without significant improvement in prevention and treatment, the World Obesity Federation predicts that the global economic impact of obesity will reach \$4.3 trillion annually by 2035.<sup>2</sup> As well as the economic costs, obesity markedly affects the lives of those living with it, with significant impacts on quality of life, mental wellbeing, activity and productivity.

Obesity can be caused by many different factors which makes it complex to understand and treat. From a person's genes, through to their own individual circumstances and environment.

**"Despite the wealth of scientific evidence to demonstrate the complexity of obesity, society is continually told that weight gain, and weight loss, are simple."**

*- The Complexity of Obesity, Lancet, Nov 2019, Vol 7, 11, p833.*



Indeed, over the years, different schools of thought have emerged on the classification and treatment of obesity, with different camps on whether obesity is a chronic disease or a behavioural problem at its core.

Recently, the debate has intensified with the emergence of 'weight loss jabs', with some questioning whether this is reflective of societies' failure to tackle the root causes of obesity.<sup>8</sup> Furthermore, with evidence indicating that weight gain can return once treatment stops, some have asked whether this offers a practical, long-term solution.

One thing many do agree on is that merely recommending diet and exercise cannot be the only route forward any more. A new approach is needed to tackle obesity. One that is holistic, individualised to the patient and realises long-lasting behaviour change.

There are tools at our disposal. Namely digital health and the range of possibilities it offers with the application of telemedicine, apps, communication tools and artificial intelligence as part of a holistic pathway. In this report, we examine the potential benefits these components can offer looking at recent studies.

**"A new approach is needed that recognises the complexity of obesity and provides patient-centred, multidisciplinary care which more closely meets the needs of each individual with obesity."<sup>9</sup>**

*- The Potential Role of Digital Health in Obesity Care.  
Adv Ther. 2022; 39(10): 4397-4412.*

# 1.

## Removing barriers to treatment and increasing access

There are a range of barriers an individual may encounter when attempting to engage in obesity management or weight loss programmes and initiatives, which may, in turn, limit their effectiveness and success.

From personal embarrassment, worry and low motivation through to access, convenience and cost. And that's just scratching the surface of a long list. However, evidence suggests weight loss programmes delivered via digital channels can offer many benefits within obesity pathways in both removing these barriers, increasing access and delivering reductions in body mass index (BMI).

Indeed, in a systematic review and meta-analysis on the effectiveness of telemedicine on BMI, significant weight reductions were achieved in interventions lasting six months or more.<sup>10</sup> This illustrates the need for a long-term ongoing care relationship in place of episodic care.

Furthermore, in a qualitative study, individuals cited how digital weight management programmes helped to remove stigma and anxiety.<sup>11</sup> Some participants noted how it helped create a 'safe space' to talk about issues, and provided an environment where individuals could feel comfortable. While it was also said that such programmes 'expedited access to treatment and provided greater continuity of provision, affording various practical benefits of a timely and reliable service.'

In some scenarios individuals described the comfort of home and its ability to have other sources of support on hand as well, such as a partner or pet. Participants also highlighted how video appointments meant they did not have to leave the house which could be a cause of anxiety in itself.

Others explained how it had given them feelings of self-confidence, motivation and control.

Responses included:

- **"I liked that they did the group thing online... I don't want to be showing people how overweight I am, so I can do this online fine, [but] face-to-face... I stutter."**
- **"It's more gentle when you do it this way... because having to get up and go to a meeting would have just stopped at least half of us even attending."**
- **"If you're a binge eater or bulimia with that comes depression; anxiety; so sometimes you just don't want to leave the house or venture out."**

In clinical approach, some individuals described how digital programmes provided quick referrals and links to other helpful services such as talking therapy and online peer support. While others highlighted "greater consistency and support" and speed of access as key benefits.

Other features of treatment said to be beneficial included the setting of expectations and the stages individuals would go through from their first session. This included providing agendas for sessions, regular follow ups and monitoring to keep motivation high.

While participants also valued the convenience afforded by digital to easily amend appointments where necessary. Some explained how a hesitancy to travel may have previously resulted in a cancelled appointment, but digital offered the necessary flex which could result in less cancelled appointments, and provide services that could more easily fit around one's lifestyle.

## What we're doing at Kry

Kry provides a comprehensive, holistic weight management programme to help people living with obesity to build long-term lifestyle changes. As part of our holistic pathway, individuals can access ongoing support from specially trained weight management doctors and nurses. In Sweden and Norway, our pathway also includes dieticians, physiotherapists and psychologists which individuals can access through our digital platforms.

Duration of our programme can last from 6 months to 2 years and combines medical expertise and support for nutrition, sleep, mental health and exercise. Specially trained nurses work with individuals to understand their needs and deliver a structured and tailored weight management programme with goal setting and continuous support.



## 2.

# Driving engagement and adherence

A key application of digital shown to deliver positive results is that of health apps themselves and self-monitoring technology.

These solutions can provide tailored programmes to the individual based on their current behaviour and lifestyle. This in turn can help drive engagement and adherence, which can result in weight loss.

**“Available evidence suggest that mobile health apps are effective in achieving weight loss and weight loss maintenance and are at least as effective as in-person interventions”<sup>9</sup>**

- *The Potential Role of Digital Health in Obesity Care. Adv Ther. 2022; 39(10): 4397-4412.*

Certainly, in a review of 39 studies on digital self-monitoring tools including websites, apps, wearables, e-scales and more, 74% of interventions positively correlated with weight loss.<sup>12</sup> These tools were also found to be more effective vs non-digital forms of self-monitoring with higher engagement rates in 21 out of 34 comparisons.

**“Self-monitoring via digital health is consistently associated with weight loss in behavioural obesity treatment.”<sup>12</sup>**

- *Self-Monitoring via Digital Health in Weight Loss Interventions. Obesity. 2021; 29(3) 478-499.*

Other evidence similarly suggests that apps can be effective for reducing weight and improving overall health in key areas such as glucose levels and blood pressure.<sup>13</sup> The capabilities of these tools to facilitate ‘effortless self-monitoring of diet and physical activity’ in addition to providing regular feedback and reminders are cited as key features in driving user engagement and with it, successful weight management.

Other beneficial app components cited include the provision of health-related information and digital coaching alongside provision of face-to-face coaching and assessment sessions.





## What we're doing at Kry

Currently in Sweden and Norway, Kry's app and websites enable delivery of personalised weight management interventions. At the outset of our programme, individuals can access a calculator to monitor BMI, and also submit blood pressure and weight measurements. Our platform is intuitive and easy to use.

Based on the results, we create a personalised treatment plan adapted to the individual's needs for diet, exercise and healthy habits. The individual can then access tailored information and lifestyle content where and when they need it on an ongoing basis. A clinician will also regularly check-in to track progress throughout treatment.



### 3.

## Overcoming stigma and increasing personalisation

Conversations about obesity can be challenging to broach for both clinicians and patients alike. It has been likened to 'breaking bad news' with significant communication barriers and stigma attached that have to be overcome.<sup>14</sup>

Digital forms of communication can help however, and the humble email, SMS text message and website have been shown to deliver some positive results.

Indeed, research shows that both channels have the potential to be effective communication tools for obesity management.<sup>15</sup> In four trials, it was reported that communications through such channels had significantly aided weight loss compared with no contact or face-to-face contact over a period between 3 and 24 months.

#### Approaches employed by trials included:

- The utilisation of a web-based portal whereby individuals would self-report and practise online problem solving
- A telephone-based weight loss programme whereby participants received personalised text messages, with goals, rewards and benefits set
- Participants self-reporting by text message once a week and at weekends and receiving tailored feedback that was congratulatory or motivational in tone
- Individuals receiving a weekly email from a dietitian including diet and exercise advice. This was accompanied by self-reporting on weight, and attending a clinic and weight check after 6 months.

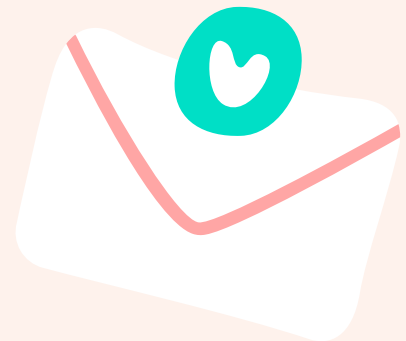
Key aspects of these approaches include personalisation, the role of reporting in aiding self-awareness and the remote involvement of a dietician or clinician to build trust in programmes. This can also potentially limit the amount of clinical time required and costs involved. While text messaging offers an effective, simple means of communication for patients.



## What we're doing at Kry

A core component of our holistic pathway is ongoing patient communication delivered by Kry Livi clinicians. Our physicians play a central role in the lives of individuals, acting as health coaches that provide advice, guidance and support, to help individuals form long-lasting healthy habits.

Complementary to this approach, we provide a comprehensive programme of educational and medical content to support behaviour change. This is delivered by our obesity management team via a range of channels, including digital content hubs, video and SMS. And we work to engage individuals in weight management programmes through Kry Livi's online content and email newsletters.



## 4.

# Finding new possibilities in obesity management

Looking to the future, the continuing evolution of digital technology offers a host of new avenues for obesity management.

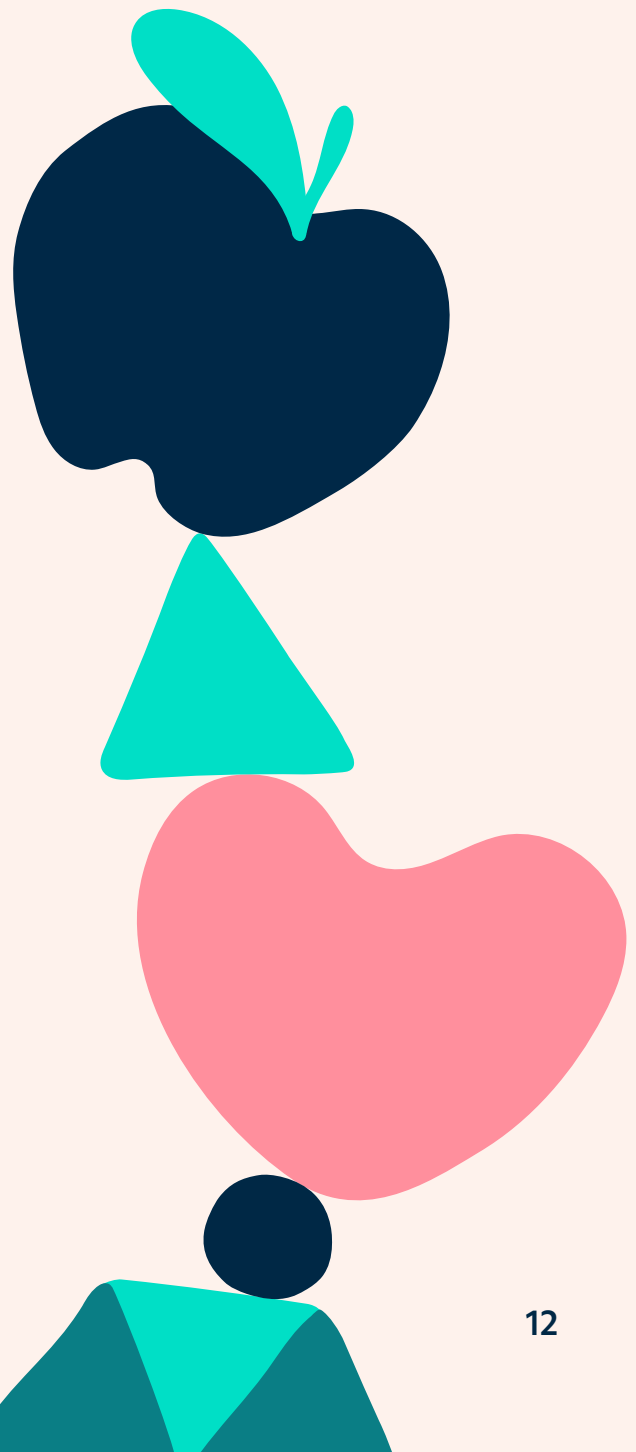
Data from wearable devices that have the ability to track heart rhythm and blood oxygen levels could make a significant impact on the management and prevention of obesity and cardiovascular disease, if integrated with patient medical records.<sup>9</sup>

While the ongoing development of 'Just in time adaptive interventions' (JITA) incorporating machine learning could make obesity interventions even more personalised and tailored to the individual. JITA can help to deliver support based on an individual's current behaviours and circumstances in a given moment. While further research is required, some studies already indicate that JITA approaches can increase physical activity.<sup>16</sup>

Furthermore, the promise of AI could enable us to predict obesity at an early age. Certainly, in a recent review, machine learning algorithms, decision trees and artificial neural networks were all found to be helpful for the purposes of prediction in childhood obesity.<sup>17</sup> AI, if applied appropriately to patient data could help us to understand more about the determinants of obesity and the very complexity highlighted at the beginning of this report.

Already, researchers have developed algorithms that can predict an individual's responses to different foods which could enable more individualised dietary plans.<sup>18,19</sup> And advancements in AI chatbots and conversational AI could support nudge theory, providing subtle, supportive messages to promote healthy lifestyles.

In a study on behavioural chatbot, 'Tess', for the purposes of behavioural counselling of adolescents coping with weight management and prediabetes, participants reported experiencing positive progress toward their goals 81% of the time.<sup>20</sup>



## What we're doing at Kry

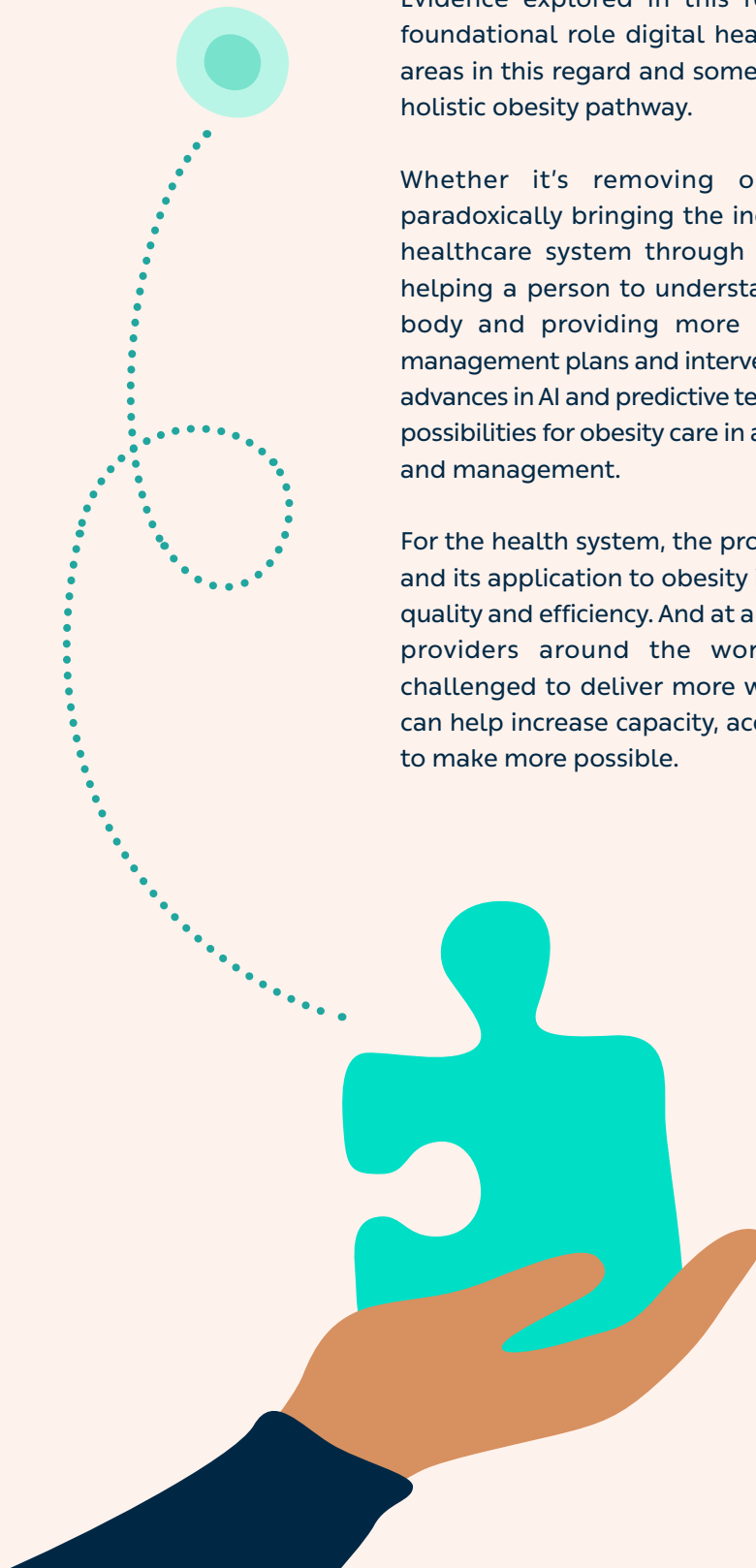
We believe AI and predictive technology will be integral to the future of weight management programmes. Our R&D in this area promises potentially significant gains in the global fight against chronic diseases.

Our vision is not to provide digital consultations in place of in-person care. It's about integrating digital into the patient journey to ensure continuous and connected care taking into account the physical and mental determinants of health. And we're working to equip the system with tools that enable smarter decisions, reduce admin and allow clinicians to focus more on what matters most of all - giving patients the best care possible.

So far, we are applying generative AI technology to the clinical processes which our clinicians work with every day. Now, we're looking at ways AI can be applied holistically to care pathways to deliver more personalised experiences across multiple touchpoints, such as provision of adaptive information and lifestyle advice.



# Conclusion



Obesity is a complex issue caused by multiple factors which differ from person to person. Successful weight management not only requires approaches that remove the many personal barriers individuals face when engaging in obesity programmes, but also more personalised approaches that drive engagement, adherence and ultimately, success.

Evidence explored in this report illustrates the foundational role digital health can play in many areas in this regard and some key components of a holistic obesity pathway.

Whether it's removing obesity stigma and paradoxically bringing the individual closer to the healthcare system through remote channels, or helping a person to understand more about their body and providing more personalised weight management plans and interventions. While ongoing advances in AI and predictive technology point to new possibilities for obesity care in assessment, treatment and management.

For the health system, the promise of digital health and its application to obesity is one of gains in both quality and efficiency. And at a time when healthcare providers around the world are increasingly challenged to deliver more with less, digital tools can help increase capacity, access and effectiveness to make more possible.

# About Kry's obesity programme

As Europe's leading digital-physical healthcare provider, Kry is committed to the long-term management of chronic disease. Our long-standing and successful obesity programme, first launched in Sweden, is now expanding globally across Europe.

We know weight can be affected by medical, genetic, mental, environmental and emotional factors, and it requires a holistic and multi-modal approach that does not start and end with prescribing medication.

Therefore, our programme can include several professional categories working together to ensure patients receive effective treatment at the right time. Through our digital platforms, we have the capability to combine clinical expertise, diet, exercise and mental health. We are the only company that can scale technology and care management expertise, enabling our partners to choose key elements that suit their needs.

Pathways may include the following:

- **Nurses** - onboard the individual and provide continuous support and guidance throughout a personalised care journey
- **Dieticians** - translate theoretical knowledge into practical advice about nutrition, teaching how to sustain healthy dietary behaviour
- **CBT** - fosters understanding around the root causes of obesity and teaches coping techniques that improve quality of life, self-esteem and eating attitudes

- **Physiotherapy** can treat injury and help individuals to lead a less sedentary lifestyle
- **Peer support** - enables individuals to share lived experiences of coping with obesity, problem-solving strategies and advice
- **Medication** - may be prescribed where appropriate and used in combination with diet, exercise and behaviour changes

Our focus is on continually improving the patient experience by increasing access, embedding digital into healthcare, and collaborating with partners to address chronic diseases through research and dedicated pathways.

As such, we are committed to fostering ongoing open dialogue on obesity, both with the healthcare system and global partners to take action.



## What Kry's medical community is saying



*"The role of general medicine is to not only treat disease, but also work proactively to improve population health. Due to high demand and scarce resources, clinicians in primary care seldom have the opportunity to do so. Instead of treating obesity alongside other conditions like hypertension and diabetes, we need to target it.*

*That means offering holistic, individualised and easy accessible care. I believe we have an opportunity to give patients something which is really unique. If we do that, we'll not only make a difference for the individual, but society as a whole."*

**Dr Joakim Röstlund, Medical Director, Kry Sweden**



*"Obesity encourages the onset of diabetes, cardiovascular disease and cancer, and impairs quality of life and mental health. It also has very high direct and indirect costs. Caring for individuals living with obesity requires a wide range of skills, including those of GPs, specialists, dieticians and adapted physical activity coaches.*

*It's a long-term process. Telemedicine can help to streamline care for those who find it hard to travel or difficult to interact with others because of self-image."*

**Dr Nicolas Leblanc, Medical Director, Livi (Kry) France**



*"Addressing obesity in Europe is paramount as it not only impacts significantly on individual health but also exerts a large strain on healthcare systems. I believe that a holistic approach integrating nutrition, physical activity and mental wellbeing, supported by a multidisciplinary team is essential to combat this complex challenge effectively.*

*By working together, we can empower individuals to reclaim their health and pave the way for a healthier, happier future."*

**Dr Bryony Henderson, Associate Medical Director, Livi (Kry) UK**







*"Currently across Europe, I believe we have a 'sickness system' instead of a healthcare system. We must proactively look at how we improve patients' health and wellbeing. Tackling obesity with digital care is one way we can help improve the health of millions.*

*Patients need support with behaviour and lifestyle changes to make a positive impact on their future health outcomes. By working together with patients over a long period of time, we can ensure sustained, long-term change. Doing so will help the individual to find their best weight, maintain it and improve their future health.»*

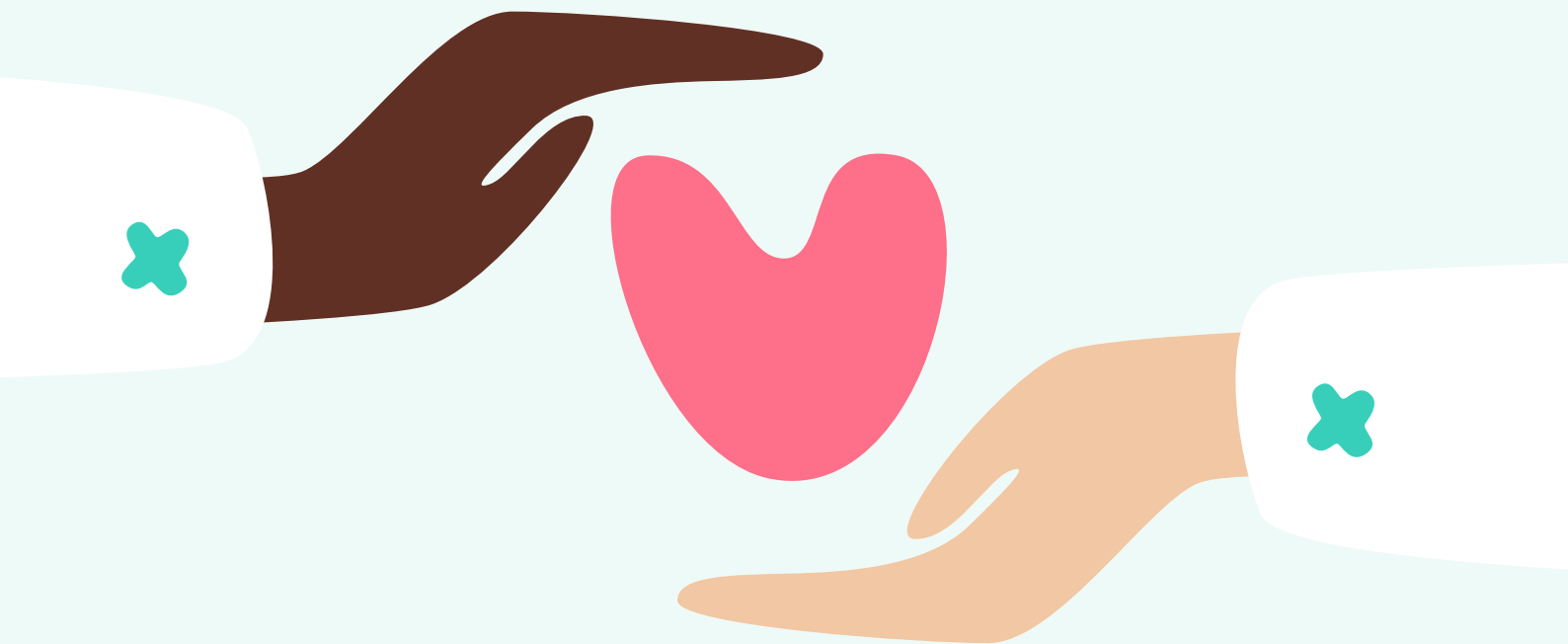
**Dr Charlotte Salter, Head of Lifestyle Medicine, Kry Norway**



*"Working in healthcare we have all seen the growing problem with obesity affecting all specialities of medicine and surgery alike. With too few tools and resources available these patients have often ended up slipping through the cracks of the healthcare system with no institution able to care for them in a complete and holistic way.*

*By providing an easily accessible multidisciplinary treatment approach we can have a huge impact on the wellbeing of individuals that will hopefully last for generations."*

**Dr Yamin Granberg, Medical Director, Kry Global**



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