



GAM

RESEARCH PRESENTS



Medication education and adherence
in Polish and British young adults

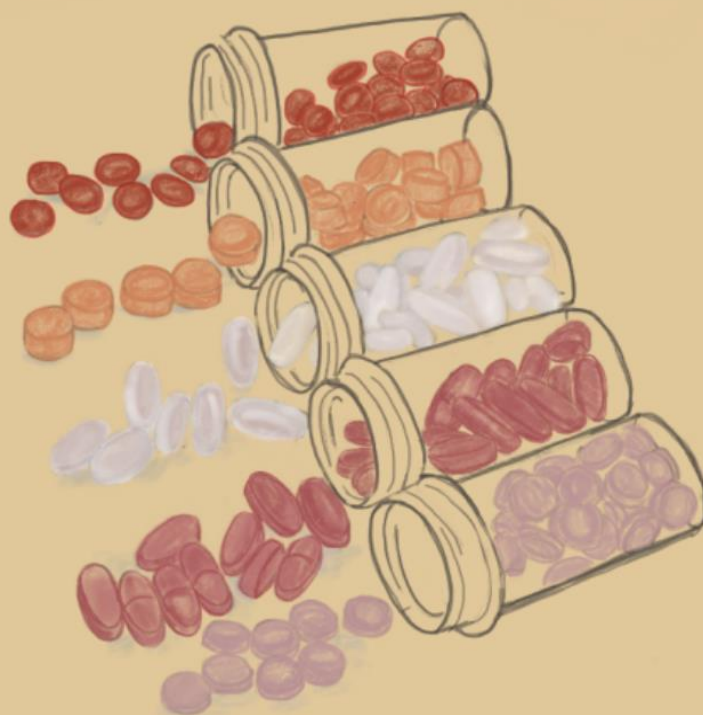


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Medication education and adherence in Polish and British young adults

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Abstract: This report aims to explore the level of medication education and adherence in Polish and British young adults aged 20-35. It does so by presenting and analysing the results of a qualitative case study conducted by the authors in October 2023. Key factors affecting medication adherence are identified with consideration of participant nationality and medication experience. Possible solutions to the concerning global treatment nonadherence rates are presented along with directions on how to expand research on this topic.

Keywords: medication adherence, young adults, patient-healthcare provider communication, long-term medication use, education, healthcare interventions

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GAM Research & Background

Global Awareness Movement (GAM) is an initiative created by young people from Poland, which is spreading all over the world. We aim to highlight the importance of social and environmental issues by creating awareness campaigns, projects, competitions and online events. We want to provide a safe space for active discussions and allow people to learn from each other and inspire one another. We believe that even the smallest actions can drive positive change. *GAM Research* is where you can find all the data, statistics and knowledge we have gathered while working on our projects. We believe it is extremely important to explore what we are passionate about as it is the best way to learn and we do that in collaboration with experts from different fields.

In October 2023, we came across an article written by Dr Robert H. Shmerling for Harvard Health. It explored the recent shifts in life expectancy within the United States. What initially piqued our curiosity was the revelation that, after years of continuous increases in average life expectancy, a reversal had occurred. This decrease was not solely attributed to social determinants of health but also the daunting factors of COVID-19, drug overdoses and accidental injuries, which collectively accounted for approximately two-thirds of the decrease in life expectancy. Additionally, chronic conditions such as heart and liver diseases also played their part in this troubling trend. These truly caught our attention. Upon further research, we were shocked to discover that numerous theoretically curable diseases account for the majority of premature deaths globally. We soon discovered that this perplexing phenomenon could be largely due to the widespread issue of medication nonadherence.

As a youth-driven initiative, we were naturally inclined to investigate how young individuals perceive and interact with medications. Our motivation was underpinned by the understanding that, at some point in life, almost everyone must grapple with the use of medications. Recognising the role that young people play in instigating positive change, with this research we hope to shed light on this problem that holds the potential for significant improvements in global health.

Olga Drygała

Global Head of Project, Education and Research at *GAM*

Expert Commentary

As societies age, the prevalence of chronic health conditions tends to increase. People affected by such long-term disorders are often reliant on one or more medications. However, some of the progress achieved thanks to the development of safer and more effective therapeutics is nullified by treatment nonadherence. Similarly, the COVID-19 pandemic showed that the ultimate societal impact of medical interventions can be dramatically influenced by human attitudes. It is thus vitally important to investigate whether patients are aware of how their medications should optimally be taken – and to what degree they comply with those recommendations. Furthermore, the knowledge of factors affecting medication awareness and adherence could inform measures aiming to improve them. All these topics were tackled in a recent report by Olga Drygała and Maria Albrychiewicz from the Global Awareness Movement (GAM).

The authors of *Medication education and adherence in Polish and British young adults* deserve commendation for focusing on an oft-overlooked topic as the use of medications by the young rarely figures in the public consciousness. Meanwhile, the latter – as noted by the report – can both contribute to young adults' ignorance about the consequences of medication nonadherence and increase the latter due to social stigma. I also appreciated the distinction between the occasional medication users and those who need to take them on a long-term basis due to chronic conditions. Altogether, the report is an interesting piece of qualitative research, which attempts to explore various aspects of the problem and assess the potential of possible solutions, including digital tools. Although the uncertain representativeness due to participant selection *via* convenience sampling and the small sample size mean that the findings cannot be easily generalised to the entire population of Polish and British young adults, the authors were clear about these and other limitations of their methodology, and their results are still valuable as a starting point for more quantitative large-scale research.

In my opinion, the link between medication (non)adherence and the fast-paced nature of modern life particularly warrants an in-depth investigation – as does the influence of relatives' first-hand experience with chronic medication use (as either healthcare workers or patients) on young adults' medication awareness and adherence. Furthermore, I believe that the report is right to emphasise the crucial role of communication between patients and healthcare providers – not least through the consistent use of the term *adherence* (implying collaborative partnership in the development of the treatment plan) instead of a more "hierarchical" and "top-down" *compliance*. The idea that healthcare providers could help increase the levels of medication adherence in their patients by providing them with specific advice on how the optimal use of the prescribed drug can be reconciled with some more challenging life

circumstances also merits further research. Finally, it would be interesting to see this study extended to include young adults without higher education. A larger sample size would also enable a more meaningful comparison between Polish and British participants – which, as the authors admitted, could reveal the potential impact of differences in healthcare system organisation between Poland and the UK.

The *Medication education and adherence in Polish and British young adults* report throws the spotlight on an infrequently tackled subject matter. This awareness-raising initiative is especially praiseworthy given that the study authors – who are at the very beginning of their scientific careers – managed to perform it independently and with very limited resources. As such, it clearly shows both their passion for socially impactful research and familiarity with the conventions of academic writing. I thus wish Ms Drygała and Ms Albrychiewicz further accomplishments – and I am looking forward to reading the GAM medication adherence guidebook.

Milena Malcharek

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Introduction

In the latest World Health Statistics check-up, the World Health Organization underscored the alarming prevalence of non-communicable diseases such as diabetes, asthma, cardiovascular disease and cancers, which collectively account for a staggering 74% of all annual global deaths (WHO, 2023). According to WHO chief Tedros Adhanom Ghebreyesus, this “sends a stark message on the threat of noncommunicable diseases, which take an immense and increasing toll on lives, livelihoods, health systems, communities, economies and societies” (UN News, 2023). Shockingly, despite the availability of effective treatments, in the past, it was estimated that patients with chronic illnesses take their prescribed medications at a rate of only around 50% (Jimmy & Jose, 2011). The Centers for Disease Control and Prevention in the United States report that nonadherence leads to 30 to 50 percent of chronic disease treatment failures each year (FDA, 2016). This means that many individuals are not reaping the full benefits of potentially life-saving treatments.

Medication adherence, as defined by World Health Organization, is “the degree to which a person’s behaviour corresponds with the agreed recommendations from a health care provider” (Jimmy & Jose, 2011). Unlike the term “compliance”, adherence suggests a collaborative partnership between patients and healthcare professionals in determining the most effective treatment plan. Extensive literature reviews demonstrate that medication nonadherence in developed countries averages around 50%, with some studies reporting alarmingly high rates of up to 92%.

Naturally, the rates of adherence fluctuate over time and across regions due to demographic, socioeconomic and psychological factors. Nonadherence encompasses a range of behaviors, from never initiating treatment and discontinuing medication without medical guidance to deviating from the prescribed dosage. Whether intentional, rooted in personal beliefs and attitudes, or unintentional due to inadequate or insufficient knowledge about a medication and its use, nonadherence can have significant physical and mental health repercussions. This holds true not only for chronic but also over-the-counter medications.

Unfortunately, measuring medication adherence and misuse remains a challenge, and practicing physicians often remain unaware of the magnitude of this issue. In the United States, for instance, medication nonadherence is estimated to result in at least 125,000 preventable deaths and an additional \$100 billion in medical costs annually (Jimmy, B. & Jose, J). This topic represents a critical yet often overlooked avenue for improving the quality of life and reducing the economic burden on a global scale.

Another important factor in maximising treatment outcomes is the correct use of medications. Medication-medication, medication-food/drink and medication-condition interactions can occur leading to alterations in the action of a particular drug and unexpected side effects. Knowledge in this area could prove crucial to one's health, especially in cases of polypharmacy, where multiple medications are administered at the same time (Harvard Health, 2016). Many medications are also time-sensitive due to reasons such as the body's hormonal fluctuations or the need to maintain a particular concentration of active ingredients. Being truly medication adherent, therefore means not only taking medications as frequently as prescribed but also ensuring the right dose and appropriate and timely administration (Schultz, 2023).

This case study aims to delve deeper into the subject matter through exploring the level of medication education and adherence in British and Polish young adults and the potential for future transformative interventions and digital solutions.

Research Questions

1. How does medication adherence and awareness vary among young adults in Poland and the United Kingdom, and between chronic medication takers and non-takers?
2. What are the common factors influencing medication adherence, including consistency, forgetfulness, and patient-provider communication, in both cultural contexts?
3. How do differences in healthcare systems and cultural factors affect medication adherence and awareness among the study participants?
4. What role does digital technology play in aiding medication adherence?
5. What suggestions do participants provide for improving medication adherence, and how can these be applied to healthcare interventions?
6. What impact does the level of education have on medication adherence and awareness among the study participants?

Research Objectives

1. Compare medication adherence and awareness between young adults in Poland and the United Kingdom, and between medication takers and non-takers.
2. Explore the factors influencing medication adherence (consistency and forgetfulness), including the influence of family, doctors, and societal stigmas, within both cultural contexts.
3. Investigate the role of patient-provider communication in providing information about appropriate medication usage and its impact on adherence.
4. Analyse the role of digital technology in medication adherence and propose potential digital tools for improving medication adherence.
5. Assess the suggestions provided by participants for improving medication adherence and awareness.
6. Examine the impact of healthcare system differences and cultural factors on medication adherence and awareness among participants.
7. Discuss the implications of the study's findings for healthcare interventions targeting improved medication adherence.
8. Evaluate the role of education in enhancing medication adherence and awareness among young adults.
9. Address any limitations of the study, such as sample size and self-reporting bias.
10. Summarise the key findings and their significance.

Scope and Methodology

Research Design and Team:

This report is based on eight interviews, designed and conducted by the members of the *Global Awareness Movement* Education Department, namely Olga Drygała and Maria Albrychiewicz.

Participant Selection:

The interviews targeted two distinct groups, each one further divided into two subgroups:

- Polish young adults aged 20-35, residing in Poland:
 - 2 participants with chronic diseases who take chronic medications (one male and one female), further referred to as **medication takers**
 - 2 participants without chronic diseases who do not require chronic medications (one male and one female) – further referred to as **medication non-takers**.

- British young adults aged 20-35, residing in the United Kingdom:
 - 2 participants with chronic diseases who take chronic medications (one male and one female), further referred to as medication takers
 - 2 participants without chronic diseases who do not require chronic medications (one male and one female), further referred to as medication non-takers.

Choice of Age Group:

The age group of young adults aged 20-35 was purposefully selected for this study due to its unique position in the life course. At this stage, individuals are often transitioning into greater independence, including taking control of their health decisions and medication management. Exploring the attitudes and behaviours related to medication use in this demographic provides valuable insights into the factors influencing these choices and decisions of young people. As a youth-driven initiative, this age group is of particular interest to us.

Gender Inclusion Rationale:

To ensure a comprehensive and well-rounded understanding of medication-related attitudes and behaviours, both male and female participants were included in each subgroup of the study. This gender-balanced approach recognises the potential for gender-specific variations in health-related decision-making, medication adherence, and attitudes. By including participants of both genders, the study aims to provide a more nuanced exploration of the subject matter.

Data Collection:

The interviews were conducted in October 2023 using real-time videotelephony to facilitate effective communication.

Interview Structure:

Each interview followed a structured format with all participants responding to the same standardised set of questions. Efforts were taken to minimise potential interviewer bias, ensuring a consistent and objective data collection process.

Sampling Method:

Given time and resource constraints, convenience sampling was employed. This method was chosen for its practicality and accessibility, allowing the research team to engage with a diverse group of participants while staying within the study's limitations.

Ethical Considerations:

In line with sound ethical research practices, all potential interviewees were provided with comprehensive information about the study's objectives and the procedures for handling data. They were also informed of their right to withdraw from the study at any point without consequence. Additionally, it is important to note that each participant granted written informed consent to take part in the study, ensuring that the research was conducted in an ethical and transparent manner.

Participants

1. Polish Participants

Participant 1 (P1) – Chronic Medication Taker

Gender: Female

Age: 20

Education: Bachelor's degree in IT for Criminology (pending),

Medication experience: 4 years, a single medication administered once a day

Participant 2 (P2) – Chronic Medication Taker

Gender: Male

Age: 23

Education: Master's degree in Psychology (pending)

Medication experience: 13 years, a single medication administered once a day

Participant 3 (P3) – Medication Non-Taker

Gender: Female

Age: 25

Education: Master's degree in Economics and Information Systems

Medication experience: occasionally prescribed a medication, occasionally takes over-the-counter medications

Participant 4 (P4) – Medication Non-Taker

Gender: Male

Age: 25

Education: Master's degree in Finance and Accounting

Medication experience: rarely prescribed a medication, frequently takes over-the-counter medications

2. British Participants

Participant 5 (P5) – Chronic Medication Taker

Gender: Female

Age: 30

Education: Master's degree in Applied Linguistics (pending)

Medication experience: 1.5 years, multiple medications administered once a day

Participant 6 (P6) – Chronic Medication Taker

Gender: Male

Age: 21

Education: Integrated Master's degree in Neuroscience (pending)

Medication experience: 12 years, multiple medications administered once a day

Participant 7 (P7) – Medication Non-Taker

Gender: Female

Age: 21

Education: Bachelor's degree in Comparative Literature with French (pending)

Medication experience: very rarely prescribed a medication, rarely takes over-the-counter medications, a close relative takes medications long term

Participant 8 (P8) – Medication Non-Taker

Gender: Male

Age: 20

Education: Bachelor's degree in Computer Science (pending)

Medication experience: very rarely prescribed a medication, very rarely takes over the-counter medications, a close relative is a nurse

Summary of Results

1. Polish Participants; Medication Takers and Non-Takers

Medication Adherence and Awareness:

- Medication takers (P1, P2) revealed a lack of consistency in the timing of their medication intake.
- Medication non-takers (P3, P4) claimed to follow a consistent schedule when prescribed a medication.
- All participants were aware of the recommended consistent timing for medication intake.
- All participants, except one medication taker (P1), claimed to always be aware of potential interactions their medications might have with other prescription and over-the-counter medications.
- All participants, except one medication taker (P2), were aware of potential interactions between their medications and food and drink.

Information Sources:

- One medication taker (P2) and one medication non-taker (P4) claimed to always read the medication leaflet.
- Both medication takers (P1, P2) and one of the medication non-takers (P4) reported engaging in online research about their medications.

Patient-Healthcare Provider Communication:

- On a scale from 1 (not at all involved) to 5 (very involved), medication takers (P1, P2) expressed an average involvement level of 3.5 in the collaborative establishment of their treatment plans. They also stated that their doctors provided clear instructions on proper medication intake.
- Only one medication non-taker (P3) reported receiving information from their doctor regarding potential medication interactions with other medications.
- All participants, except one medication taker (P2), acknowledged that their doctors inform them of potential interactions between their medications and food and drink.
- All participants claimed to always inform their healthcare providers about their current medication regimens.

Medication Adherence and Forgetfulness:

- On a scale from 1 (very rarely) to 5 (very often), medication takers (P1, P2) reported occasional forgetfulness, with an average score of 2.5.
- On the same scale, medication non-takers (P3, P4) scored an average level of forgetfulness of 2.
- Medication takers (P1, P2) listed oversleeping, morning rushes and overall busyness as the reasons for forgetting to take medications.
- Medication non-takers listed becoming overwhelmed with the amount of other responsibilities and feeling better as the reasons for forgetting to take their medications.

Integration into Daily Life:

- Both groups found incorporating medication into their everyday lives easy, with an average score of 1.5 on a scale from 1 (very easy) to 5 (very difficult) in each group.
- Common reasons for this included having a well-defined routines and taking their treatment seriously their treatment seriously, especially when feeling unwell.
- Medication takers (P1, P2) used strategies like pillboxes and tracking the remaining medication supply.
- Medication non-takers (P3, P4) relied on phone alarms and their established routines.
- The only digital technology used to aid medication adherence, if any, was the reminder / alarm app on their phone.

Challenges and Deviations:

On an Individual Level:

- The majority of participants highlighted consistency as the most challenging aspect of taking medications long term.
- One medication non-taker (P4) emphasised the importance of remembering to have them on hand, especially during travel.
- One medication taker (P2) claimed to have never intentionally deviated from prescribed dosages while one (P1) admitted to self-discontinuing a medication due to side effects.
- One medication non-taker (P3) admitted to have mixed medications with alcohol before, and another one (P4) admitted to sometimes taking unnecessary medication for recreational purposes.

On a Global Scale:

- Medication takers identified the culture of haste, limited public education on medication management, and the complexity of administering certain medications as factors contributing to medication nonadherence on a global scale.
- Medication non-takers highlighted that some individuals believe that the potential consequences of improper medication intake do not apply to them.

Suggestions for Improved Adherence:

On an Individual Level:

- Three out of four respondents (P1, P2, P3) indicated that a designated app could potentially help them with medication management.
- One medication non-taker (P4) suggested that increased family support would help in enhanced medication adherence.
- The same medication non-taker (P4) expressed concern about privacy and data security issues with health-related apps.

On a Global Scale:

- In response to global low adherence rates, medication takers proposed the implementation of an anti-stigmatisation campaign (P1) and emphasised the importance of early education on medication management (P2).
- Medication non-takers (P3, P4) suggested that healthcare practitioners play a pivotal role in building awareness and should educate patients not only the possible consequences of medication nonadherence and misuse but also about the mechanisms of medication action.
- All participants expressed the view that young people may exhibit lower concern for medication adherence as they are statistically more resilient and healthier in comparison to older age groups.

Additional Comments:

P1, a medication taker: "I think in Poland it is easy to feel stigmatised over taking medications chronically and it is also easy to get discouraged about treatment if there is a 2-year-long waiting list. Something needs changing because not everyone can afford private healthcare".

2. British Participants; Medication Takers and Non-Takers

Medication Adherence and Awareness:

- All participants in this group (P5, P6, P7, P8) revealed a lack of consistency in the timing of their medication intake.
- All participants, except one medication non-taker (P7) were aware of the recommended consistent timing for medication intake.
- All participants claimed to always be aware of any potential interactions their medications might have with other prescription and over-the-counter medications.
- One medication taker (P5) and one medication non-taker (P7) claimed to always be aware of potential interactions between their medication and food and drink.

Information Sources:

- Only one medication non-taker (P7) claimed to always read medication leaflets.
- One medication taker (P5) relied on information from the medication packaging.
- All participants, except one medication non-taker (P7) reported engaging in online research about their medications.

Patient-Healthcare Provider Communication:

- On a scale from 1 (not at all involved) to 5 (very involved), medication takers (P5, P6) expressed an average involvement level of 2.5 in the collaborative establishment of their treatment plans. They also stated that their doctors provided clear instructions on proper medication intake.
- Only medication takers (P5, P6) reported receiving information from their doctor regarding potential medication interactions with other medications.
- One medication taker (P6) and one non-taker (P8) reported that their doctors do not inform them of potential interactions between their medications and food and drink.
- All participants claimed to always inform their healthcare providers about their current medication regimens.

Medication Adherence and Forgetfulness:

- On a scale from 1 (very rarely) to 5 (very often), medication takers (P5, P6) reported rare instances of forgetfulness, averaging a score of 1.5

- On the same scale, medication non-takers (P7, P8) scored an average level of forgetfulness of 3.
- Medication takers listed occasional lapses due to feeling ill for reasons unrelated to their initial condition as the reasons for forgetting to take their medications.
- Non-takers listed oversleeping and organisational challenges as the reasons for forgetting to take their medications.

Integration into Daily Life:

- On a scale from 1 (very easy) to 5 (very difficult), medication takers (P5, P6) found incorporating medication into their daily lives relatively easy, scoring an average of 2.5.
- On the same scale, medication non-takers (P7, P8) found it considerably more challenging to incorporate medication into their daily lives, scoring an average of 3.5.
- Among takers, reasons for this included sporadic forgetfulness and only taking a single medication a day.
- Among non-takers, reasons for this included requiring privacy for certain treatments and lack of immediate negative effects of missed doses.
- Medication takers (P5, P6) employed strategies such as always maintaining a supply of extra medication on hand and setting reminders on their phones.
- Medication non-takers (P7, P8) relied on pillboxes and memory.

Challenges and Deviations:

On an individual level:

- Medication takers emphasised the importance of ensuring a supply of extra doses (P5) and highlighted the obstacle encountered when travelling or studying abroad due to the differences in healthcare systems worldwide (P6).
- Medication non-takers pointed out remembering (P8) and deteriorated mental health (P7) as the biggest challenges to medication adherence.
- Only one non-taker (P7) claimed to never deviate from prescribed dosages.
- One medication taker (P5) indicated only ever intentionally skipping a dose when extremely ill.
- One medication taker and one medication non-taker (P6, P8) admitted they had self-discontinued a medication when they thought it was optimal.

On a Global Scale:

- Medication takers recognised the pervasive culture of haste, limited public education on medication management, and experiencing adverse side effects

associated with certain medications as factors contributing to medication nonadherence on a global scale.

- Medication non-takers suggested that some individuals might be indifferent towards their own health and place more trust in the advice of family members than medical professionals.

Suggestions for Improved Adherence:

On an Individual Level:

- One medication taker (P5) indicated that inconsistency in their medication intake could only be improved if they were able to organise better.
- Non-takers suggested the utility of phone notifications (P8) and a reduction in the societal stigma surrounding medication intake (P7), particularly in public settings.

On a Global Level:

- In response to global low adherence rates, medication takers (P5, P6) recommended enhancing patient involvement in treatment decisions, stressing the importance of collaboration in establishing the course of therapy.
- One medication taker (P5) noted that some individuals might perceive a top-down approach as condescending.
- Non-takers (P7, P8) suggested that education and illustrating the consequences of medication nonadherence and misuse are crucial strategies to promote better adherence.
- One medication taker and one medication non-taker (P5, P7) expressed the view that young people care more about appropriate use of medications and medication adherence due to their relative novelty to the area and their adeptness with internet resources. Interestingly, both participants were female.
- One medication taker and one medication non-taker (P6, P8) believed that young people may demonstrate lower concern for medication adherence because of their limited experience and the statistical likelihood of better health compared to older age groups.

Additional Comments:

P7, a medication non-taker: “Maybe it would be worth exploring the impact of family members and friends of chronically ill people on their medication adherence”.

Discussion

1. Medication Experience: experiences, attitudes and awareness

Polish Medication Takers vs Non-Takers:

In comparison to the non-takers, medication takers reported a slightly lower level of consistency in medication intake timing. This discrepancy can be attributed to the inherent challenge of maintaining long-term consistency, particularly for medication takers. Common factors contributing to medication forgetfulness included feeling overwhelmed by other responsibilities and oversleeping. Interestingly, it appears that medications are not always a top priority for young individuals.

Both medication takers and non-takers demonstrated a strong comprehension of appropriate medication use. However, non-takers acknowledged instances of intentional, inappropriate medication usage attributing this behaviour to being young and reckless. In contrast, medication takers strived to adhere to prescribed doses but also encountered more adverse side effects which sometimes led to discontinuation of treatment. This underscores the significance of side effects in influencing patients' decisions about medication adherence. Negative side effects can be demotivating, potentially prompting patients to discontinue treatment, even when the unmanaged illness threatens with more severe consequences in the future. This points out another serious problem: the lack of education and understanding of illnesses and medication mechanisms of action. When patients are instructed without explanation or consideration of alternative options, they may feel less autonomous and may be less likely to comply with the treatment plan, both in case of short- and long-term illnesses.

Unfortunately, not all participants received comprehensive information from their doctors about medication interactions and relied on family, medication leaflets and the internet instead. This underscores the need for improved patient-healthcare provider communication.

British Medication Takers vs Non-Takers:

Medication takers in this group declared a higher level of consistency in the timing of their medication intake compared to the non-takers. The reason for this discrepancy might arise due to the medication takers' greater understanding of the importance of medications in maintaining their overall well-being. Common reasons for non-takers forgetting to take

medications included issues with self-organisation and oversleeping, whereas medication takers occasionally lapsed due to illness, either related or unrelated to their initial conditions. It becomes apparent that medication takers place a higher priority on their medication regimen and treat it with greater seriousness compared to non-takers.

Furthermore, both medication takers and one of the non-takers demonstrated an overall comprehensive understanding of appropriate medication use. However, all participants except one non-taker admitted to instances of intentional, inappropriate medication usage linking this behaviour to a sense of trust in their own judgment over their doctor's instructions or temporary illness. This once again highlights the importance of fostering patient-healthcare provider collaboration rather than mere patient compliance.

Surprisingly, none of the participants received comprehensive information from their doctors regarding medication interactions. They relied on sources such as leaflets, medication packaging, and the internet for supplemental information. Yet, one medication taker and one non-taker lacked knowledge about potential interactions with food and drink, suggesting that self-guided reading on medications may not be sufficient.

Overall Cross-Experience Comparison:

In a comprehensive cross-experience analysis, it becomes clear that medication takers and non-takers, whether Polish or British, share a common understanding of appropriate medication use. Both groups recognise the importance of medications for maintaining health, although with inter- and within-group differences in consistency of adhering to their prescribed medication. This suggests that the level of medication adherence may not necessarily be associated with one's medication experience but rather the severity of one's condition, individual choices, patient-healthcare provider communication and external factors such as one's working environment or family support.

2. Cultural Comparison: experiences, attitudes and awareness

Polish vs British Medication Takers:

All medication takers, regardless of their nationality revealed inconsistencies in the timing of their medication intake. However, Polish medication takers exhibited a higher frequency of forgetting to take their medications compared to their British counterparts. This discrepancy may be due to a combination of individual and cultural factors. It appears that British participants have a more conscientious approach to medication than Polish individuals, citing their original condition or falling ill for other unrelated reasons as the primary reasons for occasional lapses in medication intake. Polish individuals, on the other hand appeared to prioritise other responsibilities and sleep over their recommended medication schedules.

Polish and British medication takers demonstrated a similar level of understanding regarding appropriate medication use. Both groups also admitted to instances of intentional, inappropriate medication usage, influenced by factors such as negative side effects or personal perception of what is optimal for their well-being. Once again, this highlights the importance of both physical and mental well-being in sustaining long-term medication adherence. Notably, one of the Polish medication takers mentioned the effects of stigmatisation on young people who may feel unwelcome at healthcare providers and embarrassed about their condition as taking medications at a young age is not widely normalised in Poland. In contrast, British medication takers explained that “British people do not like to be told what to do” and this sentiment may contribute to perceiving some healthcare services as condescending. These results suggest that medication adherence can be drastically influenced by external factors, which require broader social changes.

Unfortunately, participants from both groups shared a common lack of comprehensive information from their doctors about medication interactions, relying on the internet or medication leaflets for supplementary knowledge. Interestingly, Polish medication takers expressed a higher average level of involvement in establishment of their treatment plans than British participants, who reported minimal involvement. These findings highlight a potential gap in the services provided to British participants, where there is a strong perception that British individuals appreciate making autonomous decisions regarding their healthcare, yet they feel they do not receive adequate patient recognition.

Polish vs British Medication Non-Takers:

Contrary to British non-takers, Polish medication non-takers, claimed to follow a consistent schedule when prescribed a medication. However, the forgetfulness score for Polish non-takers was only slightly better than for British non-takers. All participants were aware of the

recommended consistent timing for medication intake and cited similar reasons for forgetfulness.

Polish non-takers demonstrated a comprehensive understanding of appropriate medication use, including awareness of potential interactions with other medications and food and drink. British non-takers showed slightly lower knowledge in this area, with one participant lacking information about potential medication interactions with food and drink. However, when it came to intentional inappropriate medication use, British non-takers showed a more responsible approach compared to their Polish counterparts. This surprising contradiction suggests that while Polish non-takers seemed to be well-informed about medication adherence and usage, they approached treatment with a somewhat more relaxed attitude. This might be linked to their observation that some individuals, especially young people, believe to be exempt from the potential consequences of improper medication intake. The reason for this could be the limited visibility of young medication takers in the public sphere and the associated stigma surrounding medications, potentially leading to ignorance.

Similarly, British non-takers suggested that some individuals may remain indifferent to their own health, even when fully aware of the potential repercussions of inappropriate medication intake. This indifference may stem from the belief that they have engaged in riskier activities in their lives, such as drugs. One of the British non-takers also mentioned that some people might not feel comfortable administering medications in public spaces.

Regrettably, none of participants received comprehensive information from their doctors regarding medication interactions, leading them to rely on external resources such as the internet or medication leaflets.

Overall Cross-Cultural Comparison:

A cross-cultural analysis reveals that Polish and British participants show a higher level of medication-related knowledge and positive behaviours than their counterparts, depending on the aspect being considered. In general, however, British participants expressed a more conscientious approach towards appropriate medication usage, while Polish participants tended to be more relaxed in this regard. This might be influenced by the associated social stigmas in Poland, potentially leading to diminishing the perceived importance of treatment. Although seemingly taking medications in public appears more socially acceptable in the United Kingdom, the act itself might still carry an element of discomfort. Additionally, the importance of individualism among British people emerges as a significant factor influencing these attitudes, highlighting the complexity of cultural elements in medication adherence. Unfortunately, a common challenge both Polish and British participants faced was the lack of comprehensive communication with their healthcare providers, suggesting that this issue may transcend borders and be a global concern.

3. Education and Awareness: education level and adherence

All participants, regardless of their nationality and medication experience, highlighted the absence of education about medication mechanisms of action and appropriate usage in their school curriculums. At the time of the study, participants had achieved a similar level of formal education, with some pursuing health-related courses. However, the differences in attitudes and awareness between participants studying health-related and unrelated courses were not clear enough to indicate a connection with the level of medication adherence. Nevertheless, as suggested by the participants, education in this specific area could play an important role in determining patient's choices and behaviours.

4. Factors Influencing Medication Adherence and Suggestions for Improvement

Factors influencing medication adherence between medication takers and non-takers seemed to vary more than between the two nationalities. However, many of the factors identified were not limited to a particular group and in practice could affect anyone, regardless of their medication experience. A comprehensive list of these factors, together with suggestions for improvement is presented below:

Factor: Experiencing negative side effects affecting mental and/or physical well-being

Suggestions: Self-discontinuation of treatment could be prevented through improved patient-provider communication. Possible treatment alternatives and strategies for mitigating negative side effects should be discussed prior to or when these occur.

Factor: Feeling ill for reasons related/unrelated to the initial condition

Suggestions: Healthcare provider should inform patients about steps to take in such situations to ensure safe alterations to treatment when necessary.

Factor: Complexity of administering certain medications (privacy and hygiene issues)

Suggestions: Alternatives could be available and should be discussed with the healthcare provider. In cases where no alternatives exist, patients could consider other means to simplify the administration process, such as utilising a medical kit.

Factor: **Lack of immediate effects of missed doses, discontinuing treatment once feeling better**

Suggestions: Education in this area, including an understanding of medication mechanisms of action and long-term consequences of nonadherence, is vital.

Factor: **Problems with accessing medication when travelling, especially abroad**

Suggestions: Maintaining extra medication supply should become a habit, especially for long-term medication users. It is crucial to stress the discrepancies between healthcare systems globally and the importance of self-organisation. Some medications are not always available immediately and one should always have some extra medications on hand in case of any unexpected events. Additionally, discussing alternative treatments with healthcare providers or seeking support through groups and foundations in cases of financial difficulties is advisable.

Factor: **Medication-medication, medication-food/drink, medication-condition interactions**

Suggestions: These interactions should be discussed with the healthcare providers when establishing the treatment course. It is also important to explain the mechanisms of action of medications and the consequences of ignoring these interactions, so that patients can make informed decisions.

Factor: **Deterioration in mental health**

Suggestions: Deterioration in mental health could occur due to reasons other than the direct side effects of medications. For many people, the perspective of taking medications long-term can be daunting and upsetting. Help could be sought through family, friends and support groups.

Factor: **Oversleeping, morning rushes**

Suggestions: While in some cases it is essential that the medication is administered in the mornings, in other the timing could be adjusted. This could be discussed with the healthcare provider.

Factor: **Culture of haste**

Suggestions: Many of the study participants cited becoming overwhelmed with the amount of other responsibilities and prioritising them over their medication schedule. Here, self-organisation is essential. Having an established routine, using pillboxes and setting phone reminders could help in managing medication as recommended. While disruptions to routines (for example holidays) occur and phone reminders are not always practical (for example if in a meeting), these

strategies are available and it is up to the individual to establish which one works the best for them.

Factor: Societal stigmas, limited public education on medications and their management

Suggestions: Increased education on medications, their mechanisms of action and appropriate management is needed through school curricula and by health organisations. The study revealed that the issue of societal stigmas affects primarily long-term medication takers. Support is available through dedicated support groups. As decreasing societal stigmas is a long-term goal, it is important that in the meantime people feel as comfortable as possible taking medications wherever they are.

Factor: Family and friends

Suggestions: Some of the participants highlighted the role that their relatives play in their medication adherence and claimed to trust their judgement and advice over that of their healthcare provider. The results of the study also showed that non-takers whose close relatives are health workers or suffer from a chronic condition are more aware of challenges medications takers face and learn about medications primarily from them. This means that relatives of frequent medication takers should also have a good understanding in the area.

Factor: Age

Suggestions: While the study focused on one specific age group – young adults – the majority of participants suggested that younger people may be less conscientious about appropriate medication use. They attributed this to being young, believing that they will not experience the possible negative consequences because they are statistically healthier compared to older age groups and have relatively more urging responsibilities. At the same time, they considered young people to be more digitally literate and able to gain information through the internet and social media. Their suggestions for improvement of medication adherence, especially amongst young people, included creating online awareness campaigns and designated secure medication management apps.

Factor: Gender

Suggestions: The study's findings did not show any clear association between gender and medication adherence levels. Nevertheless, it is noteworthy that both participants who mentioned the existence of societal stigmas were female. Additionally, two female participants expressed the belief that young people tend to be more diligent in their approach to medication adherence. These

observations indicate a variety of experiences and attitudes towards medications, suggesting that education and management of some external factors can play a pivotal role in bridging potential gaps.

Factor: Culture

Suggestions: Attitudes towards medications may differ between cultures. Hence, it is important that healthcare providers are trained to effectively communicate with their patients based on their cultural inclinations, characteristics, beliefs etc.

The factors influencing medication adherence ultimately converge to **three critical pillars: enhanced patient-provider communication, comprehensive education and building awareness**. By fostering open dialogue, we can empower patients to make informed decisions and optimise their medication management, hopefully improving their overall health and well-being. This approach embodies a commitment to **longtermism**, as it not only addresses immediate medication adherence challenges but also establishes a sustainable foundation for the future.

5. Healthcare System Differences

Both NHS (National Health Service) in the United Kingdom and NFZ (National Health Fund) in Poland share a common aim of ensuring universal access to healthcare. However, they diverge in their funding mechanisms: the NHS is financed directly from the state budget, affording all ordinary UK residents free access to medical care, while NFZ relies on a health insurance system, covering approximately 91% of the population (Myśliński et al., 2022). Those not covered by the insurance are only provided outpatient emergency medical care, which makes private healthcare providers an integral part in the Polish system.

Furthermore, the NHS operates with decentralised management in each of its four countries (England, Scotland, Wales and Northern Ireland) while NFZ is administered centrally at the national level (Walkowiak, 2019). Both systems emphasise primary care as the first point of contact for patients providing initial healthcare services and referrals to specialists. However, according to the study participants, waiting times for certain specialist medical services tend to be shorter within the NHS.

Despite these several differences between the healthcare systems in Poland and the United Kingdom, they are similar in their primary characteristics. Nevertheless, the scope of our study does not allow us to draw meaningful conclusions regarding their impact on medication adherence levels in either system.

6. Digital Technology and Implications for Healthcare Interventions

The only digital tool employed by our participants, if any, to aid medication adherence was the reminder/alarm application on their phones. Some of them, however, noted that standard pop-up notifications can be easily overlooked and alarms can be casually snoozed without even unlocking the phone, rendering them insufficient in some cases. They suggested that a designated app featuring personalised notes, infused with additional information and motivation, would be of more help. Interestingly, Polish participants showed a greater interest in this idea compared to their British counterparts, which might imply that they were less aware of such digital tools available on the market.

Although some health-related apps already exist, none of our participants were currently making use of them. One participant expressed concerns regarding confidentiality and privacy issues tied to health-related apps, especially given the sensitivity of the data they collect. Therefore, any prospective app designated for medication management must address numerous ethical and legal considerations. Ideally, it should originate from a trusted source, like in the case of the new *NHS App* in the United Kingdom or *mojeIKP* in Poland, which facilitate access to healthcare services but currently lack medication adherence-related features. These features, including personalised reminders and interaction information, represent a potential enhancement to be incorporated into these apps and other similar future applications.

Recent studies have shown that mobile apps hold the potential to contribute to enhanced medication adherence (Harvard Health, 2020) offering an exciting avenue for exploration. With time, these apps could be further improved, potentially incorporating features like gamification or incentive programs. Gathering insights from patients would be invaluable in shaping these developments. Ideally, they should also integrate with electronic health records, allowing for easy access to medication histories and records and tailoring interventions accordingly.

Another interesting digital tool that has been developed is smart medication packaging equipped with built-in sensors that can detect when a dose is taken. However, the use of such devices is not without costs and currently primarily serves research purposes (Riekert & Rand, 2002).

In addition to advancing new digital tools, the practical implications of our study findings extend to the area of healthcare interventions. Online anti-stigmatisation awareness campaigns hold immense potential. According to participants, it is vital not just to discuss the consequences of improper medication use but to illustrate them. Encouraging young people to share their experiences can foster empathy and understanding, emphasising that health problems and medication adherence are universally relevant, irrespective of statistical probabilities. Furthermore, participants emphasised the importance of influential

figures, including celebrities and role models, openly discussing their health conditions. This can provide a sense of having someone to identify with and feeling less alone, particularly for those struggling with stigma and isolation.

However, educational endeavors such as campaigns and workshops need not only target patients but also engage healthcare practitioners who play a pivotal role in reshaping the status quo. Achieving visible, long-term changes may necessitate shifts in curricula, policy and behavioural norms.

In the meantime, some immediate actions could be taken to fight the problem of medication nonadherence, such as promoting social media support groups, delivering trustworthy, patient-friendly information through sources like leaflets, medication packaging, and the official NHS and NFZ websites. These approaches can offer valuable support while longer-term strategies evolve.

Conclusion

The aim of this study was to explore the level of medication education and adherence in British and Polish young adults and to propose potential future transformative interventions and digital solutions. The findings cover several key themes, including medication experiences, cultural comparisons, education and awareness, factors influencing medication adherence, healthcare system differences, and the role of digital technology in driving positive change.

One notable observation is that medication takers, whether Polish or British, often struggle with maintaining consistent medication intake timing, which emphasises the challenges inherent in long-term adherence. Various factors contribute to medication forgetfulness, including overwhelming responsibilities, oversleeping, and the tendency for medications not to be a top priority for young individuals. Furthermore, the study underscores the significant impact of side effects on patient decisions regarding medication adherence. Negative side effects can demotivate patients and lead to treatment discontinuation. Other factors influencing medication adherence include societal stigmas and healthcare environments. This highlights the need for more comprehensive education about illnesses and medication mechanisms.

The study also showed that improved patient-healthcare provider communication is essential to bridge the gap in the knowledge about appropriate use of medications and in

particular interactions. Not all participants received such information from their providers, relying on sources such as family and the internet instead.

In a cross-cultural context, British participants exhibit a more conscientious approach to medication adherence, while Polish participants demonstrate a more relaxed attitude, which may be linked to social stigmas and consequently diminished importance of treatment.

Digital technology in the form of personalised mobile apps was identified as a potential tool for medication adherence enhancement. While health-related apps exist, concerns about confidentiality and privacy arose within our participant group and would need to be addressed in future developments.

Beyond digital tools, healthcare interventions can play an important role in addressing medication adherence challenges. Online anti-stigmatisation campaigns and influential figure sharing their health experiences could be the first step in that direction. Future educational campaigns should target not only patients but also healthcare practitioners, as reshaping healthcare systems requires changes in curricula, policies, and societal behaviours.

In conclusion, this study reveals that enhanced patient-provider communication, comprehensive education, and increased awareness are pivotal pillars in addressing medication adherence. Digital tools could also contribute to the positive shift if developed with sufficient consideration of patient needs and privacy rights. These findings align with a long-term commitment to improving patient health and well-being, bridging gaps in medication adherence, and ensuring better health outcomes for all.

Future Research

Future research could explore issues such as the practical effectiveness of digital tools in improving medication adherence as well as ways in which these tools could be integrated into healthcare services. As this report suggests, digital inequalities do not fully explain the digital divide in health and individuals' orientations should be considered to inform future developments in the field. Further similar studies could include an extended set of variables, including digital literacy, family support or socioeconomic status.

As *Global Awareness Movement*, we are also planning to compile a follow-up, patient-friendly guidebook on medication adherence based on extensive literature review and an interview with an expert in the field. It will soon become available on our website:

<https://globalawarenessmove.wixsite.com>.

Limitations of the Study

This study utilised self-reporting as a primary data collection method and employing convenience sampling approach. While the research aimed to gain insights into medication education and adherence as well as possible future healthcare interventions and digital tools, it is important to acknowledge several limitations that may impact the generalisability and comprehensiveness of these findings:

- **Small sample size and qualitative nature:** The study's limited sample size and qualitative nature may restrict the generalisability of findings. Although it provides rich, context-specific insights, it may not fully represent the range of factors influencing medication adherence.
- **Limited exploration:** The study focused on a subset of factors known to influence medication adherence rather than examining all potential variables, such as socioeconomic factors.
- **Participant selection:** Convenience sampling employed may introduce selection bias and limit the representativeness of the sample, which means that the findings may not apply to populations with different characteristics, for example other age groups.
- **Self-reported data:** The study relied on self-reported information rather than direct observation, which can be subject to biases including recall and social desirability bias.
- **Interpretation subjectivity:** Qualitative analysis involves interpretation, which can introduce subjectivity. Efforts were made to minimise bias but the potential for interpretation differences remains.

In summary, this study offers valuable qualitative insights into medication adherence within its specific context. However, the above limitations must be considered when applying the findings to broader populations. Future research with larger and more diverse samples and consideration of more factors may yield a more thorough understanding of medication adherence behaviours.

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Useful links

The NHS App: <https://www.nhs.uk/nhs-app/>

Aplikacja mojeIKP: <https://pacient.gov.pl/internetowe-konto-pacjenta/poznaj-mojeikp>

Learn more about your medications: <https://www.nhs.uk/medicines/>

Dowiedz się więcej o swoich lekach: <https://obywatel.gov.pl/pl/ochrona-zdrowia-i-ubezpieczenia-spoeczne/informator-o-lekach-portal-informacyjny>

Reminder:

If in doubt, contact your healthcare provider. Do not alter your treatment on your own.