Universität Basel

Medizinische Fakultät
Departement Public Health

SQUEEZE

25 Years of Growth
2000-2025
Nursing Science
Pflegewissenschaft
Universität Basel

Ongoing development of the SQUEEZE eHealth facilitated integrated care model to improve adherence to Disease-Modifying Antirheumatic Drugs in adults with Rheumatoid Arthritis – an Implementation Science project

Sofia Calado[1], Christina Wettengl[1], Sabina De Geest[1,2], Janette Ribaut[1], Bart van den Bemt[3,4], Simone Brand[5], Loreto Carmona[6], Kristina Chingov[7], Mary-Louise Daly[5], Andreas Dam[8], Codruta Filip[7], Estibaliz Loza[6], Chrysoula Manolaraki[9], Teresa Oton[6], Diego Kyburz[5], Agnes Kocher[1,5], on behalf of the SQUEEZE WP8 team

[1]Institute of Nursing Science, Faculty of Medicine, University of Basel, Basel, Switzerland, [2]Department Public Health and Primary Care, KU Leuven, Leuven, Belgium, [3]Department of Pharmacy, Radboud University Medical Center, Nijmegen, Netherlands, 4Departments of Pharmacy and Research, Sint Maartenskliniek, Nijmegen, Netherlands, [5]Department of Rheumatology, University Hospital Basel, Basel, Switzerland, [6]Instituto de Salud Musculoesquelética (InMusc), Madrid, Spain, [7]European Alliance of Associations for Rheumatology (EULAR), Zurich, Switzerland, [8]HealthBuddy, Copenhagen, Denmark, [9]Rheuma Basel, Basel, Switzerland

INTRODUCTION

Disease-modifying antirheumatic drugs (DMARDs) slow rheumatoid arthritis (RA) progression[1].

However, adherence rates remain suboptimal, leading to poor clinical outcomes, and increasing healthcare utilization[2].

DMARDs adherence-enhancing interventions in RA are scarce, methodologically weak and have not been translated into daily clinical practice[3].

Moreover, integrated care models fit to deliver adherence interventions are lacking, and embedding eHealth solutions remains limited[3,4].

AIM

We describe the ongoing development of the **SQUEEZE eHealth facilitated integrated care model** to improve DMARDs adherence in adults with RA, to be pilot-tested and implemented in two Swiss-centres.

METHODS

Theoretical underpinning: Grounded in the eHealth-Enhanced Chronic Care Model[5], we combine methods from implementation, behavioural, and computer sciences.

Medication Adherence taxonomy: We use Vrijens' taxonomy[6] composed by: initiation, implementation, and persistence.

Intervention development approach: Primary development follows the Behaviour Change Wheel[7] (BCW). Simultaneously, we incorporate insights from state-of-the-art medication adherence (MA) interventions in transplantation, specifically the effective real-world Medication Adherence Promotion System[8] (MAPS) intervention.

Evidence integration: RA-specific evidence is integrated, including a systematic review of DMARD adherence interventions[3] and contextual factors[9].

Co-design process: An international team of clinicians, IT-developers, and patient-research-partners co-designs the intervention, engaging clinician and patient-panels.

RESULTS

Select target behaviours

Through the BCW, we identified **five target behaviours** related to implementation and persistence adherence—phases where non-adherence is reported—across all DMARD administration routes (Figure 1).

Overall behaviour: Taking the DMARDs according to the individual regimen and administration route agreed with the rheumatologist				
Implementation Phase			**Persistence Phase**	
Taking the prescribed DMARD(s)	Taking the right DMARD(s) dose	Adhering to clinical appointments for infusion/SC injection of DMARDs	Persisting on taking DMARD(s) in the long-run	Persisting to clinical appointments for infusion/SC injection of DMARDs in the long-run

Figure 1. *Identified five target behaviours.*

Identify what needs to change

Subsequently, multi-level barriers to each target behaviour were identified, withdrawing from different data sources using the Capability, Opportunity, Motivation, and Behaviour (COM-B) framework (see Figure 2 for examples).

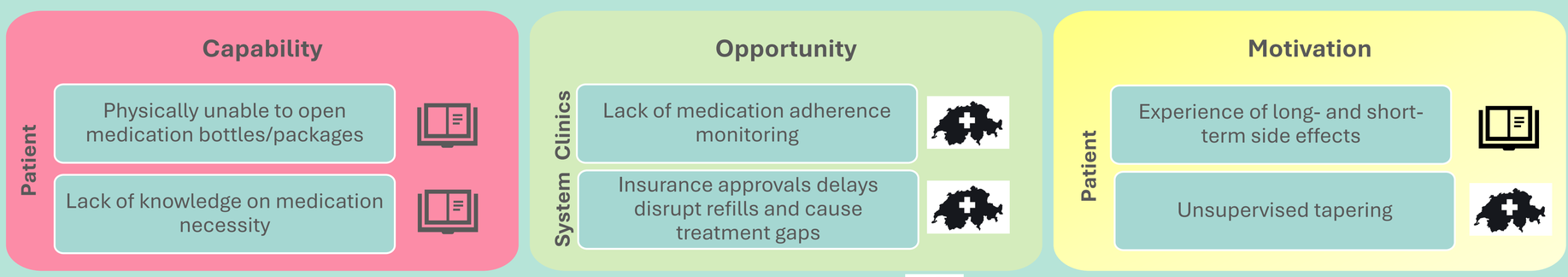

Figure 2. *Examples of multi-level barriers through COM-B analysis.* = *Literature review* = *Swiss Contextual Analysis*[9]

Preliminary components

Like MAPS, the care model is being designed to address frequent barriers. Preliminary components include DMARDs adherence and barriers assessments via Patient-Reported Outcome Measures. Identified barriers are linked to algorithm-driven interventions, tailored to individual preferences.

Delivery of components **includes trained clinicians and/or digital tools**. The model will fit into clinical-workflows, with centre-adapted implementation strategies.

CONCLUSIONS

By **integrating theory, evidence, context and stakeholder collaboration**, our dynamic approach upholds RA relevance and strengthens care models' effectiveness and implementation–both to be pilot-tested in a hybrid design.

REFERENCES

1. Smolen JS et al. EULAR recommendations for the management of rheumatoid arthritis with synthetic and biological disease-modifying antirheumatic drugs: 2022 update. Annals of the Rheumatic Diseases 2023, 82(1), 3–18.
2. Kocher A et al. Prevalence and correlates of adherence to disease modifying antirheumatic drugs (DMARDs) in adults with rheumatoid arthritis and its consequences – a scoping review. Annals of the Rheumatic Diseases 2025, 84, supplement 1, p.1464.
3. Ribaut J et al. Effectiveness and Implementation of DMARD Adherence Interventions in Rheumatoid Arthritis: A Systematic Review [poster]. EULAR congress, 11.-14.06.2025. Barcelona, Spain.
4. De Geest S et al. Adherence management in transplantation. In Psychosocial Aspects of Chronic Kidney Disease. 1st Edition. Exploring the Impact of CKD, Dialysis, and Transplantation on Patients (pp. 409-448). Elsevier 2021.
5. Gee PM et al. The eHealth Enhanced Chronic Care Model: A Theory Derivation Approach. Journal of Medical Internet Research 2015, 17(4), e86.
6. Vrijens B et al. A new taxonomy for describing and defining adherence to medications. British Journal of Clinical Pharmacology 2012, 73(5), 691–705.
7. Michie S et al. The behaviour change wheel: A new method for characterising and designing behaviour change interventions. Implementation Science 2011, 6(1), 42.
8. Hooper DK et al. A Medication Adherence Promotion System to Reduce Late Kidney Allograft Rejection: A Quality Improvement Study. American Journal of Kidney Diseases: The Official Journal of the National Kidney Foundation 2022, 79(3), 335–346.
9. Wettengl C et al. Examining rheumatoid arthritis care and eHealth support in two Swiss centres: A contextual analysis to develop the SQUEEZE care model for DMARDs adherence and implementation strategies (Oral presentation, Abstract OP0116-HPR). Presented at the EULAR 2025 Congress, Barcelona, Spain. Annals of the Rheumatic Diseases, 84(Suppl 1), 103.

ACKNOWLEDGEMENT

We thank the SQUEEZE WP8 members for their critical feedback in the development of the study methods.

CONTACT US!

https://nursing.unibas.ch
https://squeeze-project.eu
agnes.kocher@unibas.ch
sofia.calado@unibas.ch

Project funded by

Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Swiss Confederation

Federal Department of Economic Affairs, Education and Research EAER
State Secretariat for Education, Research and Innovation SERI

Funded by the European Union

UK Research and Innovation

This project has received funding from the European Union's Horizon Europe research and innovation programme under grant agreement no. 101095052, by UK Research and Innovation (UKRI) under the UK government's Horizon Europe funding guarantee grant number 10055567 as well as the Swiss State Secretariat for Education, Research and Innovation (SERI). Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or any other granting authority. Neither the European Union nor any other granting authority can be held responsible for them.