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Lesson learned from an international training program on patients' medication adherence for healthcare professionals

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ABSTRACT. **Objective.** ***Healthcare professionals play a crucial role for promoting medication adherence in older adults. This research aimed to assess changes in professionals' opinions about medication adherence after attending a course, collecting suggestions for future educational programs.***
Method. ***A one-week course on medication adherence in older adults was held involving 32 healthcare professionals and students from Italy, Portugal and Poland as part of the Erasmus+ Skills4Adherence Project. Prior to and at the end of the course, participants provided three keyword answers through a Google Form. Responses were collectively discussed and commented on.***
Results. ***At the end of the course a general tendency to put more attention on patient's beliefs and engagement was revealed. The caregivers' role was also underlined. As to suggestions for education, three keywords were considered not enough to characterize adherence issues. Conversely, professionals considered collective discussions and role-playing to be effective for increasing awareness on this theme.***
Discussion and conclusion. ***Several changes in healthcare professionals' opinions regarding determinants of medication-adherence were revealed after this dedicated course. Overall, multidisciplinary and practical training programs should be proposed for increasing healthcare professionals' awareness of factors impacting on medication adherence in older adults.***

Key words: *medication adherence, healthcare professionals, training program, medical education.*

RIASSUNTO. **Insegnamenti tratti da un programma di formazione internazionale per operatori sanitari sull'aderenza dei pazienti anziani ai trattamenti farmacologici.**
Obiettivo. **Gli operatori sanitari svolgono un ruolo cruciale nel promuovere l'aderenza ai farmaci nella popolazione anziana. Questa ricerca ha lo scopo di valutare eventuali cambiamenti di opinioni sull'aderenza farmacologica a seguito di un programma di formazione per professionisti sanitari. Sono altresì proposti suggerimenti per futuri programmi educativi.**
Metodo. **Si è tenuto un corso di una settimana sull'aderenza ai farmaci nella popolazione anziana che ha coinvolto 32 professionisti e studenti di ambito sanitario provenienti da Italia, Portogallo e Polonia nell'ambito del Progetto Erasmus+ Skills4Adherence. All'inizio e alla fine del corso, i partecipanti hanno risposto ad alcune domande attraverso un modulo di Google, fornendo tre parole chiave come risposta ad ognuna delle domande poste. Le risposte sono state discusse e commentate collettivamente in aula.**

1. Introduction

In the 1990's, the patient's non-adherent behaviour to medication and/or treatment was described as a "silent" and "invisible epidemic" (1). Even now the problem of medication non-adherence still persists (2-5), being ever thornier if we consider the continuous ageing process leading to multimorbidity and polypharmacy (6). Indeed, the annual adjusted disease-specific expense of non-adherence per person reaches 44.190 dollars (7) and the individual consequences of non-adherence on psychological and physical wellbeing remains substantial (8).

One factor that may make the difference in fostering adherence is the clinician-patient relationship (5,9-11). Indeed, poor adherent behavior is associated with the lack of a patient-centered approach (12). Conversely, taking patient's needs, beliefs and priorities into consideration may enhance adherent behavior in line with prescriptions (10,11,13).

Thus, considering the relevant role of the healthcare professionals in improving adherence, educational and training programs may be useful to teach approaches and communication strategies (14).

This research was based on a one-week educational and training full-time course for healthcare professionals on medication adherence in older patients. The aims of this paper were: to assess professionals' opinions about adherence prior and after attending the course and to collect the participants' reflections upon the course organization to identify suggestions for future educational programs.

2. Method

A one-week course (40h) (Skills4Adherence Summer School 2019) on medication adherence in the older adult was held in ICS Maugeri in Pavia on September 2019. It was dedicated to healthcare professionals and healthcare students coming from Italy, Portugal and Poland as part of the Erasmus+ Project – Skills4Adherence (www.Skills4Adherence.eu). The program included:

Risultati. **Alla fine del corso, è stata riscontrata una generale tendenza a porre maggiore attenzione all'impatto delle credenze e del coinvolgimento del paziente. È stato anche sottolineato il ruolo dei caregiver. Per quanto concerne i suggerimenti per futuri programmi educativi, tre parole chiave sono state considerate una modalità di risposta non sufficiente a caratterizzare la complessità del tema dell'aderenza. Al contrario, i professionisti coinvolti hanno descritto le discussioni collettive e i role-play come efficaci strumenti per aumentare la consapevolezza su questo tema.** ***Discussione e conclusione.*** **Dopo questo corso, sono stati rivelati diversi cambiamenti nelle opinioni dei professionisti sanitari riguardo all'aderenza ai farmaci in pazienti anziani. Nel complesso, dovrebbero essere proposti programmi di formazione multidisciplinari e pratici per aumentare la consapevolezza di questi operatori sui fattori che possono influire sull'aderenza ai farmaci nella popolazione anziana.**

Parole chiave: aderenza farmacologica, professionisti sanitari, programma di formazione, educazione in ambito medico.

face-to-face lessons, an international event on adherence in cardiovascular diseases, role-playing sessions, open discussions (topics examples: psycho-social and relational aspects, technology impact, medication review). Informal gatherings were organized to promote team-building and the exchange of opinions.

At the beginning and at the end of the Summer School, participants were asked to provide answers via smartphone to a Google Form containing four questions (three terms for each question allowed) regarding adherence (Table I). Participants were informed about the research and voluntarily signed a consent to use data for scientific purposes. During the last day, word-clouds generated from the frequencies of the words collected were shown to the participants to foster a collective discussion. The arrangement of terms was performed through the Python module called "word cloud" (15), providing a visual representation where the size of each term is directly proportional to its reported frequency (16).

After the course, the authors analysed the terms collected in order to quantify them. Adjectives and verbs were turned into nouns, plural forms were turned into singular ones if no changes in meaning occurred. The terms considered synonyms in the Collins Thesaurus were merged and the most often mentioned terms by the participants were chosen. Typing errors were corrected and semantically irrelevant terms were purged. Then the authors determined conceptual categories according to a bottom-up approach. All categories were discussed among authors (MM, ST, NG, AG) until a consensus was reached. The other authors (JW, PL, MKM, PK, EC, LM, MA) supervised the process and provided a final feedback on the identified categories. Differences between the frequencies of terms at the beginning and the end of the course were calculated by Fisher exact test, two tails ($p<.05$).

3. Results

Overall, 32 senior healthcare professionals and healthcare students from 3 countries attended the Summer School, representing various professional areas (biologists, physicians, pharmacists, psychologists, nurses). The majority of participants were female, and the age range was 24-50 years old. Detailed characteristics of the course participants are provided in Table II.

3.1. Categories emerged

Tables III-VI show the identified terms (since the questions were on a voluntary basis, some attendees did not answer to all of them).

Table I. ***Questions presented at the beginning and at the end of the Summer School***

1) Please write three words that better describe the main BARRIERS on adherence in the older adults.	Adherence knowledge
2) Please write three words that better describe the main FACILITATORS on adherence in the older adults.	
4) As healthcare professional, how could you NEGATIVELY AFFECT your patient's adherence?	Skills for adherence
3) As healthcare professionals, what could you do to FACILITATE your patient's adherence?	

Table II. ***Nationality and professions of the healthcare professionals***

Healthcare professionals	Total (n=32)	Poland (n=12)	Italy (n= 10)	Portugal (n=10)
	n (%)	n (%)	n (%)	n (%)
Physician	15 (46.8)	12 (37.5)	0	3 (9.4)
Psychologist	8 (25.0)	0	8 (25.0)	0
Pharmacist	6 (18.8)	0	0	6 (18.8)
Nurse	2 (6.3)	0	2 (6.3)	0
Gerontologist	1 (3.1)	0	0	1 (3.1)
Female	19 (59.38)	6 (50.0)	8 (80.0)	5 (50.0)
Age range	24-50	24-50	25-49	24-50

Table III. ***Three words that better describe the main BARRIERS on adherence in the older adults***

Categories	Fisher exact test	Words inside the category (n)
Treatment characteristics First day (19.6%) vs Last day (15.9%)	.557	FD: Polypharmacy (7), treatment complexity (5), side-effects (3); polytherapy (1), lack of helping products (1), drug management (1) LD: Polypharmacy (7), side effects (2), persistence (1), polymedication (1), complexity (1), single disease guidelines (1)
Cognitive functioning First day (17.4%) vs Last day (11.0%)	.281	FD: Memory (6), cognitive impairment (4), dementia (2), forgetfulness (1), lack of memory (1), lack of understanding (1), understanding (1) LD: Cognitive impairment (6), capacity (2), forgetfulness (1)
(Poor) health literacy First day (14.1%) vs Last day (9.8%)	.486	FD: Lack of knowledge (4), ignorance (3), low health literacy (3), information (1), lack of suitable info (1), poor education (1) LD: Lack of information (3), lack of knowledge (3), education (1), ignorance (1)
Financial aspects First day (14.1%) vs Last day (4.9%)	**.044 ***	FD: Cost (6), money (3), lack of money (2), economic (1), price of drug (1) LD: Cost of drugs (2), expenses (1), finances (1)
(Lack of) social and family support First day (9.8%) vs Last day (7.3%)	.601	FD: Lack of support (4), loneliness (3), Isolation (2) LD: Lack of social support (3), isolation (1), lack of caregivers (1), loneliness (1)
(Poor) patient engagement First day (7.6%) vs Last day (19.5%)	**.025 ***	FD: Communication (3), miscommunication (2), healthcare professionals (1), interaction (1) LD: Lack of communication (9), lack of empathy (3), empathy (1), impatient professionals (1), miscommunication (1), no feedback from providers (1)
Beliefs First day (6.5%) vs Last day (20.7%)	**.007 ***	FD: Lack of belief (1), lack of self-efficacy (1), mentality (1), personal beliefs (1), willingness (1), untrust (1) LD: Beliefs (12), untrust(2), disbelief(1), unwillingness(1), mistrust(1)
Emotions First day (4.4%) vs Last day (2.4%)	.685	FD: Depression (3), fear (1) LD: Fear (2)
Other First day (4.4%) vs Last day (2.4%)	.685	FD: Number (1), politics (1), behavior (1), environmental barriers (1) LD: No national scale (1), politics (1)
Clinical aspects First day (2.2%) vs Last day (1.2%)	1.00	FD: Comorbidity (1), frailty (1) LD: Frailty (1)
(Lack of) motivation First day (0%) vs Last day (4.9%)	/	FD: / LD: lack of motivation (4)

Note. FD: First Day; LD: Last Day;
The percentages are calculated as the ratio between the category occurrences and the total of the word expressed for each question.
First day respondents = 32 (tot words= 92); Last day respondents = 29 (tot words= 82);
*significant at p<.05

3.2. Last day collective discussion with participants

Collective reflections on the responses provided at the Google Form

- At the beginning, responses mirrored the educational path and professional occupation of the participants (e.g. physicians and pharmacists mentioned drug-related issues, while psychologists reported psycho-emotional aspects). Overall, the role of caregivers was considered only by few;
- The economic burden of drugs on adherence was underestimated.

Take home messages from the Summer School lessons

- When dealing with older adult patients, it is important to involve them and to ask for feedback to check if they have correctly understood their prescriptions;
- Healthcare professionals' beliefs may be different from patients' beliefs;
- It is necessary to improve the use of patients' individual strategies;
- It is necessary to pay attention to polypharmacy.

General reflections

- Even if we live in a fast world, we need to slow the pace when caring for a patient;
- The participants emphasized a change from a paternalistic approach to a more collaborative approach where the patient is a co-protagonist in the care pathway;
- It is necessary to have constant exchange of opinions with colleagues on an interdisciplinary level.

Reflections upon the course organization

- Three terms are not enough to describe adherence since it is a too complex and multifaced phenomenon. This forces participants to prioritize some concepts, neglecting the others;

Table IV. ***Three words that better describe the main FACILITATORS on adherence in the older adults***

Categories	Fisher exact test	Words inside the category (n)
Social and family support First day (30.1%) vs Last day (27.1%)	.74	FD: Support (12), family (8), caregivers (6), friends (1), social network (1) LD: Caregivers (11), social support (9), family support (3)
Health literacy First day (25.8%) vs Last day (14.1%)	.091	FD: Information (10), education (8), health literacy (4), knowledge (2) LD: Information (5), knowledge (4), education (1), explanation (1), health literacy (1)
(Promotion of) patient engagement First day (12.9%) vs Last day (29.4%)	**.006 ***	FD: Communication (8), empathy (1), good caring (1), honesty (1), relationship (1) LD: Empathy (9), ask feedbacks (5), communication (5), collaboration (1), empowerment (1), patients (1), resilience (1), self- management (1), caring attitude (1)
Financial aspects First day (8.6%) vs Last day (1.2%)	**.037 ***	FD: Money (2), refunding (2), assurance (1), fair prices (1), finance support (1), reimbursement (1) LD: Financial support (1)
(Attention for) treatment characteristics First day (5.4%) vs Last day (3.5%)	.724	FD: Unidose (2), individualized care (1), monotherapy (1), pharmacy care (1) LD: Follow-up (1), individualized care (1), medication reconciliation (1)
Beliefs First day (5.4%) vs Last day (4.7%)	1.00	FD: Trust (3), belief (1), purpose (1) LD: Beliefs (2), trust (2)
Healthcare professionals First day (4.3%) vs Last day (1.2%)	.372	FD: Doctor (1), geriatrist (1), health care team (1), nurses (1) LD: Multidisciplinarity (1)
Motivation First day (3.2%) vs Last day (10.6%)	.070	FD: Motivation (3) LD: Motivation (9)
Strategies and ICT First day (2.2%) vs Last day (2.4%)	1.00	FD: Reminder (1), strategies (1) LD: Reminders (1), technology (1)
Cognition First day (1.1%) vs Last day (2.4%)	.602	FD: Decision making skills (1) LD: Capability (1), mental stability (1)
Other First day (1.1%) vs Last day (2.4%)	.602	FD: Obedience (1) LD: Opportunities (1), will to live (1)
Time First day (0%) vs Last day (1.2%)	/	FD: / LD: Time (1)

Note. FD: First Day; LD: Last Day;
The percentages are calculated as the ratio between the category occurrences and the total of the word expressed for each question.
First day respondents = 32 (tot words= 92); Last day respondents = 29 (tot words= 82);
*significant at p<.05

- The course organization might have introduced a bias in the final responses, having stressed some topics more than others;
- The open discussion and role-playing sessions enabled participants to put into practice the knowledge learned, sustaining a change of perspectives.

4. Discussion and Conclusion

4.1. Discussion

Professionals' and students' perspectives about medication adherence, prior and after attending a one-week course on this issue, were collected; changes were quantified and collectively discussed. Suggestions for improving educational programs were gathered too.

A tendency to move attention through the patient role was revealed: at the end of the course, facets concerning patient's beliefs and engagement were mentioned more significantly as pivotal elements for medication adherence. This is in line with the recent literature underlying the importance of cooperating with the patient (5,17). This reflects the trend in the healthcare landscape to shift from a paternalistic physician-centred approach to a person-centered care approach, where the patient plays an active role in health-related decisions (18). Indeed, patient engagement is a crucial element for a successful healthcare path (19).

Moreover, participants became more aware of the role of caregivers in supporting the patient to adhere (5,11,20-22). Thus, adherence has to be considered a family issue more than an aspect solely involving the patient (6). Indeed, adherence is influenced by the quality of social support perceived such that the caregiver may help patient to overcome hindrances by providing emotional, instrumental and informative support (11,20,21).

During the role-playing sessions and open discussions, professionals had debates on problems that a patient may encounter in the attempt to adhere to the treatment. These included practical aspects of the medication (e.g. swallowing pills, managing an injection) as well as subjective beliefs and concerns (e.g. previous negative experiences, fear of side effects). The characteristics and

Table V. ***As healthcare professional, how could you NEGATIVELY AFFECT your patient's adherence?***

Categories	Fisher exact test	Words inside the category (n)
Clinician's misconduct First day (29.2%) vs Last day (13.4%)	**.025 ***	FD: Indifference (8), misinstruction (5), ignore (3), be judgmental (1), be unkind (1), blame (1), criticize (1), delayed prescription (1), distraction (1), do not listen (1), lack of respect (1), mislead (1), intolerance (1) LD: Ignore (3), disinterestedness (2), absence (1), ethical misconduct (1), insist without listening (1), negligence (1), scare the patient (1), unprioritized patient (1)
(Hindrance to) patient engagement First day (18.0%) vs Last day (25.6%)	.199	FD: Empathy (9), lack of listening (3), lack of communication (1), lack of relationship (1), lack of therapeutic alliance (1), misunderstanding (1) LD: Lack of communication (6), lack of empathy (5), lack of trust (5), detachment (2), miscommunication (2), lack of feedbacks (1)
Paternalistic approach First day (18.0%) vs Last day (11.0%)	.281	FD: Judgement (5), simplify (2), use professional terms (2), assume what one knows (1), boring technical speech (1), deny (1), entitlement (1), impose treatment (1), patronizing (1), selfish (1) LD: Assume without asking (4), judgment (2), patronizing (2), be directive (1)
(Lack of) time First day (13.5%) vs Last day (2.4%)	**.012 ***	FD: Lack of time (6), haste (5), pressure (1) LD: Lack of time (2)
(Hindrance to) health literacy First day (12.4%) vs Last day (12.2%)	1.00	FD: Ignorance (5), lack of information (5), doubts (1) LD: Lack of information (5), ignorance (4), disinformation (1)
(Poor attention to) treatment characteristics First day (5.6%) vs Last day (14.6%)	0.71	FD: Polypharmacy (2), multiple changes (1), focus on side effects (1), multiply drugs and doses (1) LD: Polypharmacy (9), frequent therapy changes (1), confusing prescriptions (1), no review medication (1)
(Lack of) social and family support First day (2.3%) vs Last day (11.0%)	**0.26 ***	FD: Lack of support (2) LD: Lack of support (9)
(Lack of) motivation First day (1.1%) vs Last day (2.4%)	.602	FD: Lack of motivation (1) LD: Lack of motivation (2)
Strategies and ICT First day (0%) vs Last day (2.4%)	/	FD: / LD: No strategies (2)
Beliefs First day (0%) vs Last day (2.4%)	/	FD: / LD: Beliefs (2)
Other First day (0%) vs Last day (2.4%)	/	FD: / LD: Distress (1), intentional nonadherence (1)

Note. FD: First Day; LD: Last Day;
The percentages are calculated as the ratio between the category occurrences and the total of the word expressed for each question.
First day respondents = 32 (tot words= 92); Last day respondents = 29 (tot words= 82);
*significant at p<.05

the management of a treatment may facilitate or prevent adherence according to the degree of integration and fit of the therapies with the daily routine of the patient (10,11,23).

As to the modality adopted to request feedback, three keywords were considered insufficient to cover all the facets that characterise adherence. Therefore, future programs should adopt a different response modality. Moreover, some factors may have been more stressed than others during the course, possibly influencing the participants' answers. For instance, financial issues were mentioned less at the end of the course. However, it has to be said that the nations involved in the course are characterised by three different but mainly public healthcare systems (24) such that the affordability of care is always guaranteed. Also, the collective discussions and role-play sessions offered during the week were described as a crucial method for increasing professionals' awareness.

Finally, this research has to be considered in the light of its limits.

Firstly, the small sample size prevents to carry on further analysis and to generalize data. However, the Fischer exact text has been chosen to unveil more robust findings, overcoming the sample size issue according to what suggested by statisticians and researchers.

Secondly, the participants' professional role is not homogeneous. This aspect may be linked to the fact that each country taking part in the ERASMUS Plus project "Skills4Adherence" has a main area of expertise, that is pharmacy for Portugal, medicine for Poland and psychology for Italy. However, the participants have been chosen among a pool of students and professionals of the participating institutions, strictly respecting the principle of equal rights, non-discrimination, and equal representation of different target groups to minimise possible biases and to pursue the equity principle. Despite this, the professional role of who agreed to partake to the specific activity described in this manuscript may potentially impact on the external validity of the study. Thus, further research must consider this aspect, finding solutions for recruiting

Table VI. ***As healthcare professionals, what could you do to FACILITATE your patient's adherence?***

Categories	Fisher exact test	Words inside the category (n)
(Foster) health literacy First day (31.1%) vs Last day (13.4%)	**.010 ***	FD: Information (9), education (8), explain (7), health literacy (3), scientific background (1) LD: Information (8), education (3)
(Promotion of) patient's engagement First day (21.1%) vs Last day (36.6%)	**.028 ***	FD: Empathy (5), listen (4), adapted speech (1), availability (1), collaboration (1), comfort (1), confidence (1), cooperate (1), engage (1), honesty (1), improve communication (1), involve the patient (1) LD: Ask feedbacks (9), empathy (7), communication (5), listen (3), be supportive (1), care (1), commitment (1), explain (1), improve self-management (1), kindness (1)
(Sustain) psycho-social and family support First day (21.1%) vs Last day (17.1%)	.568	FD: Support (17), psychological support (2) LD: Support (11), accompaniment (2), presence of caregivers (1)
(Attention for) treatment characteristics First day (12.2%) vs Last day (12.2%)	1.00	FD: Medication review (3), individualized care (1), reduce complexity (1), self-management (1), simplify (1), treatment goals (1), treatment particularities (1), one-capsule-drug (1), reduce the amount of drugs (1) LD: Reduce polypharmacy (3), follow-up (2), reliable treatments (1), telemedicine (1), evaluate (1), medication review (1), re-evaluate therapy (1)
Motivation First day (4.4%) vs Last day (11.0%)	.147	FD: Motivate (4) LD: Motivate (9)
Beliefs First day (3.3%) vs Last day (2.4%)	.623	FD: Trust (3) LD: Respect beliefs (1), trust (1)
Strategy and ICT First day (3.3%) vs Last day (6.1%)	.478	FD: Give strategies (1), app (1), visual schemes (1) LD: Strategies (4), telephone (1)
Financial aspects First day (2.2%) vs Last day (0%)	/	FD: Reduce costs (2) LD: /
Time First day (1.1%) vs Last day (0%)	/	FD: Time (1) LD: /
Other First day (0%) vs Last day (1.2%)	/	FD: / LD: Foster adherence (1)

Note. FD: First Day; LD: Last Day;
The percentages are calculated as the ratio between the category occurrences and the total of the word expressed for each question.
First day respondents = 32 (tot words= 92); Last day respondents = 29 (tot words= 82);
*significant at p<.05

more homogeneous samples not only on the basis of nationality, but also on the basis of participants' kind of occupation and age range.

4.2. Practical implications

The participants' findings and reflections highlighted the complexity of the concept of medical adherence in the older adults and suggested aspects that should be taken in consideration in clinical practice and in training programs. First, involving caregivers in adherence management is essential for the successful treatments in older adults. Indeed, social support affects adherence and, in turn, mortality and recovery rates in this population (21). Second, patients need to be involved in the decision-making process and their beliefs have to be addressed, as patient may actively adhere to treatments and prescriptions if well motivated, informed and equipped with adequate strategies (4,5,17). Finally, multidisciplinary and practical training for healthcare professionals may be a winning card for increasing awareness and empowering these workers with successful strategies and approaches.

Results of this exercise have already been used in practice: they served as a fine-tuning of the content of the educational Skills4Adherence program, which is now freely available online at www.Skills4Adherence.eu

4.3. Conclusion

This one-week course characterised with debates and practical activities appeared to be a useful and valuable way for allowing healthcare professionals to think and exchange perspectives on medication adherence in the older adults.

Conflict of Interest

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