Impact of an intervention associating the community pharmacist and the use of a mobile health application for patients with type 2 diabetes

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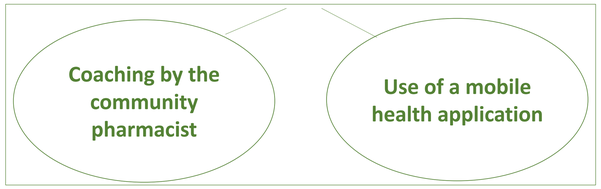
Background

Worldwide, more than 537 million people are living with diabetes, including 61 million patients in Europe[1]. Complications still present a significant burden, which can be reduced by better adherence to both medication and lifestyle advice. The community pharmacist could play a key role in supporting the patient in this process[2].

Intervention



Aims

This study aimed to:

1. Assess the impact of the intervention on the level of therapeutic adherence
2. Assess the impact of the intervention on cardiovascular risk factors

Setting

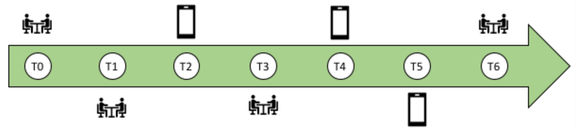
- A six-month interventional study
- Three data collection periods
- In 21 Belgian cooperative community pharmacies (either Dutch or French speaking)
- Quantitative analysis

Funding

This study was funded by the partners University of Liege, Multipharma SC and Comunicare Solutions SA, and received a research grant from Novo Nordisk.

Methods

The program included 7 contacts between the patient and his pharmacist (4 meetings at the pharmacy and 3 calls via the mobile application), one month apart each time, as well as daily access to the application. Data were collected at baseline, after 3 months and after 6 months.



Outcomes of interest :

- Therapeutic adherence level: HbA1c rate and MARS-5 score (calculated on the basis of the MARS-5 questionnaire[3]);
- Cardiovascular risk factors: systolic and diastolic blood pressure, HDL-cholesterol and LDL-cholesterol rates, Body Mass Index and waist circumference.

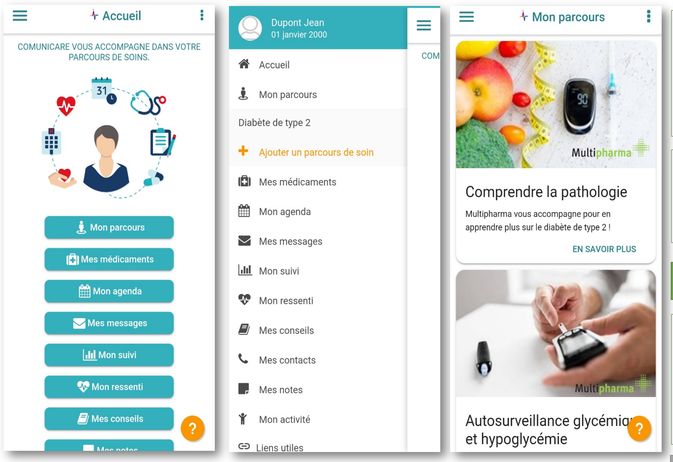


Fig. 1, 2 & 3: Content of the Comunicare mobile application (patient side)

Results

Eligible patients n=**207** → Recruited patients n=**74** → Patients at T0 n=**66** → Patients at T3 n=**50** → Patients at T6 n=**46**

Patient characteristics: mean age = 57 ± 14 years; 56% female; 67% French speaking

Outcomes	T0 n=66	T3 n=50	T6 n=46	Difference between T0 and T3 n=50	p-value	Difference between T3 and T6 n=46	p-value	Difference between T0 and T6 n=46	p-value
HbA1c (%)	6,49 ± 1,32 6,2(5,7-6,9)	6,14 ± 0,68 6,25(5,68-6,6)	6,21 ± 0,83 6,15(5,73-6,6)	-0,13 ± 0,50 0,0(-0,2-0,1)	0,15	0,05 ± 0,29 0,0(-0,1-0,1)	0,53	-0,1 ± 0,54 0,0(-0,2-0,1)	0,37
HDL-cholesterol (mmol/l)	1,39 ± 0,45 1,33(1,06-1,67)	-	1,47 ± 0,49 1,43(1,13-1,78)	-	-	-	-	0,06 ± 0,24 0,05(0,01-0,18)	0,17
LDL-cholesterol (mmol/l)	2,01 ± 0,93 1,84(1,43-2,44)	-	1,99 ± 0,97 1,71(1,41-2,46)	-	-	-	-	-0,06 ± 0,36 -0,07(-0,30-0,16)	0,35
PAS (mmHg)	135,49 ± 15,05 135(129-144)	130,38 ± 16,51 130,0(120,0-141,0)	135 ± 18,92 135(121,5-144)	-6,64 ± 15,56 -8,0(-17,0-0,0)	0,01	3,83 ± 15,0 3,0(-5,0-11,0)	0,11	-2,48 ± 19,22 -3,0(-15,0-8,50)	0,41
PAD (mmHg)	81,86 ± 9,43 80,0(75,0-90,0)	78,34 ± 13,06 76,0(70,0-87,0)	79,6 ± 11,63 80,0(73,5-86,0)	-2,64 ± 12,15 -3,5(-11,0-3,25)	0,20	-0,03 ± 11,82 -1,0(-6,0-8,0)	0,99	-2,25 ± 11,39 -1,5(-8,25-1,0)	0,07
Weight (kg)	93,03 ± 20,58 91,50(77,05-108,0)	94,50 ± 19,72 91,5(78,95-108,8)	95,21 ± 19,44 90,0(81,95-108,8)	-0,55 ± 2,46 -0,1(-1,93-1,0)	0,14	-0,75 ± 3,43 -0,5(-2,0-1,4)	0,17	-1,32 ± 3,86 -0,95(-3,08-1,43)	0,05
Waist circumference (cm)	111,14 ± 16,41 108,0(99,0-118,5)	108,87 ± 14,60 110,0(101-117,5)	110,58 ± 15,37 112,0(102,88-118,0)	-2,06 ± 4,13 -1,0(-4,0-0,0)	0,002	-0,5 ± 4,46 -0,5(-3,0-2,0)	0,49	-2,44 ± 4,92 -1,5(-5,75-0,0)	0,01

Fig. 4: Description of clinical outcomes and comparison of their evolution at T0, T3 and T6

T0-T3

Adherence rates were high at baseline (mean HbA1c = 6.49%; mean MARS-5 score = 24/25)
Systolic blood pressure decreased by 6.6 mmHg (p=0.01) and **waist circumference** decreased by 2 cm (p=0.002)
Diastolic blood pressure and **weight** showed a positive trend

T0-T6

Waist circumference decreased by 2.4 cm (p=0.01)
All outcomes showed a positive trend or stabilized

Conclusion

Systolic blood pressure and **waist circumference**, considered as **cardiovascular risk factors**, showed a significant decrease. All other outcomes changed positively of stabilized between the beginning and the end of the study. We concluded that counseling by the pharmacist, combined with the use of a mobile health application can have a positive impact on type 2 diabetics patients' health and disease management.

References

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