Original Paper

2A. BOURLA (1) MD
3Sorbonne Université, Department of Adult Psychiatry and Medical Psychology, APHP, Saint-Antoine Hospital, F-75012, Paris, France

5F. FERRERI (1) MD PhD
6Sorbonne Université, Department of Adult Psychiatry and Medical Psychology, APHP, Saint-Antoine Hospital, F-75012, Paris, France

8L. OGORZELEC (2) PhD
9Sociology and Anthropology Laboratory (LaSA - EA 3189), University of Burgundy Franche-Comté, Besançon, France

11C-S. PERETTI (1) MD PhD
12Sorbonne Université, Department of Adult Psychiatry and Medical Psychology, APHP, Saint-Antoine Hospital, F-75012, Paris, France

14C. GUINCHARD (2) PhD
15Sociology and Anthropology Laboratory (LaSA - EA 3189), University of Burgundy Franche-Comté, Besançon, France

17S. MOUCHABAC (1) MD
18Sorbonne Université, Department of Adult Psychiatry and Medical Psychology, APHP, Saint-Antoine Hospital, F-75012, Paris, France

22(1) Sorbonne Université, Department of Adult Psychiatry and Medical Psychology, APHP, Saint-Antoine Hospital, F75012, Paris, France
23(2) Sociology and Anthropology Laboratory (LaSA - EA 3189), University of Burgundy Franche-Comté, Besançon, France

AB and FF are Co-First Author (contributed equally)
New technologies: are psychiatrists ready for disruption? An original nationwide study

Abstract

Background: Recent discoveries in the field of machine learning (ML), imaging, biomarkers and medical informatics, have brought about a new paradigm shift in medicine. The aim of this study was to explore psychiatrists’ perspectives on this paradigm through the prism of new Clinical Decision Support Systems (CDSS). Our primary objective was to assess the acceptability of these new technologies. Our secondary objective was to characterize the factors affecting this acceptability.

Method: A sample of psychiatrists was recruited through mailing list. Respondents completed an online survey. A quantitative study with an original form of assessment involving the screenplay method was implemented: three scenarios, each featuring one of three support systems (1. EMA and CAT, 2. Biosensors, 3. Machine learning Blood test or MRI). Four acceptability domains were investigated based on ISO and Nielsen models (Usefulness, Usability, Reliability, Risk).

Results: We recorded 515 observations. Regarding our primary objective, overall acceptability was moderate. MRI coupled with ML was considered to be the most useful system and biosensors were considered the least. All the systems were described as risky (79.6%). Regarding our secondary objective, acceptability is strongly influenced by socio-epidemiological variables (professional culture): sex, theoretical approach and practice.

Conclusion: This is the first study to assess psychiatrists’ views on new CDSS. Data revealed correspondences between acceptability profiles and professional culture profiles. Many medical, forensics and ethical issues were raised: therapeutic relationship, data security, data storage, and piracy risk. It is essential for psychiatrists to receive training and become involved in the development of new technologies.
Keywords: Ecological momentary Assessment – Digital phenotype – Machine learning - Clinical Decision Support Systems - Computerized Adaptive Testing - Professional Culture – Acceptability
INTRODUCTION

Recent discoveries in the field of genetics, imaging and biomarkers, together with the development of medical informatics, are leading us to rethink psychiatry. The practices, representations, ethics and beliefs of practitioners could be disrupted. In science, the ability to predict the occurrence of a morbid event opens up important perspectives—not just preventive or curative, but also ethical. At the interface between e-health, new technologies and clinical observation, a large number of new tools are currently being developed for the early detection of psychotic or mood disorders and predict their course. A growing number of studies are reporting on the use of computerized assistance, especially artificial intelligence (AI), in the form of new Clinical Decision Support Systems (CDSS) and current changes to these systems tend to associate two concepts: digital phenotyping and machine learning (ML).

Torous and Gualtieri underlined the potential usefulness of connected objects in the field of mental health, as many devices now include multiple sensors (accelerometer, heart rate sensor, sleep tracker, skin conductance sensor, light sensor, etc.). The prospect of being able to gather real-time physiological data from fitness trackers, as well as from symptom checkers in smartwatches, is an attractive one, and there is increasing interest in using real-time patient data as biomarkers of illness. Their team recently developed the concept of the digital phenotype of pathology. These terms refer to the capture by computerized measurement tools of specific characteristics of psychiatric disorders. Some behaviors or symptoms may be objectifiable and quantifiable by computer tools, thereby constituting an e-semiotic. Thus, the graphorrhea observed in manic episodes can be reflected in an increase in the number of SMS messages sent, and depressive psychomotor retardation can be assessed by means of an accelerometer. Sensor miniaturization and the ubiquitous use of smartphones mean that it is now possible to collect a large amount of data that psychiatrists had never previously been able to access. Models based on these new signs are emerging in the field of schizophrenia and...
mood disorders [5]. These passive data are collected in background tasks for which no intervention is necessary. To reduce observer bias, the individual is not always aware when the data are being collected. Detection may involve a mobile phone and its onboard sensors (GPS, accelerometer, verbal flow detector, etc.) or connected wearable objects that allow biometric monitoring to take place in real time. Data can also be collected actively by ecological momentary assessment (EMA) on a smartphone but the collection of live data requires action on the part of the patient. EMA consists in the evaluation of symptoms from day to day, in the patient’s habitual environment, and as they evaluate themselves “right then, not later; right there, not elsewhere”, there can be no recall biases [7, 8]. This method allows a much more individualized approach introducing “precision diagnosis” in psychiatry [9].

All these data, far too copious to be analyzed manually, can be processed by computer software, allowing patients to be classified according to their illness. As we have seen, new technologies (smartphone, computers, and biomarkers) and the parallel expansion of medical informatics and AI have brought about a paradigm shift toward a more personalized and predictive form of medicine [10]. But if some disorders can be recognized by computer models, and if diseases can be predicted and relapses detected earlier by machines or smartphones, what role will healthcare providers play in the future?

The advent of these technologies calls into question psychiatrists’ professional culture. This sociological concept, derived from the sociology of professions, refers to the fact that in the course of their work, professionals refer not only to theoretical knowledge or experience, but also to a set of customs, a specific language and a set of common values. Indeed, some authors are already suggesting that psychiatrists are an endangered species [11]. According to sociology, a professional activity profoundly influences the identity of the individuals who exercise it [12, 13]: these individuals are defined by their membership of the profession, conceived of as a fully-fledged social group and a culture bearer, sharing values and beliefs, as
well as a common way of expressing them [14, 15]. Psychiatrists diverge from other medical specialties in terms of the predominance of clinical reasoning, the lack of specific or valid imaging techniques or biological tests, and the importance given to intuition, clinical sensitivity and therapeutic relationship. From this point of view, the psychotherapeutic dimension of the psychiatric interview could be challenged by these new technologies.

To our knowledge, there has been little research in this area, and although several studies have recently focused on the acceptability of these technologies for patients or patient compliance, potential prescribers have never been questioned on the subject. The acceptability of these technologies must therefore be assessed at different levels: usability (device’s flexibility and ease of learning), utility (technology’s contribution), satisfaction, reliability (including accuracy, effectiveness and efficiency) and risk impinges on acceptability and constitutes an important dimension of medical reasoning.

The main objective here was to analyze psychiatrists’ perspective on these new technologies by assessing the acceptability of three CDSS (smartphone based EMA, wearable biosensor and Machine learning based prediction MRI or blood test), using a model specifically developed for this purpose with a pluridisciplinary approach (psychiatric and sociological). The secondary objective was to characterize the factors affecting this acceptability, and therefore indirectly the psychiatrists' professional culture, based on the assumption that this culture can be broken down into several subtypes, which influence this acceptability in different ways.

172. MATERIAL AND METHOD

We conducted a qualitative and quantitative study via a computerized survey (Google-Form®), in collaboration with the Sociology and Anthropology Laboratory of the University of Burgundy Franche-Comté (LaSA, UBFC).
2.1 Target population and sample composition

The present study focused on a population of psychiatrists working in France. They ranged from residents to senior psychiatrists, working in psychiatric facilities, general or university hospitals, or private practices.

2.2 Survey development

We developed an original form of assessment with two researchers at LaSA UBFC, based on the screenplay method, an original form of assessment used to expose respondents to challenging and problematic clinical cases, in order to ask them to express what should be done or what they themselves have done to act with competency in such situations. By confronting the psychiatrists with systems or device that are still essentially restricted to the field of research, we were able to review some aspects of reality that are not captured by other types of evocation.

The screenplay method featured three clinical case presentations involving new technologies (Table 1 and online data supplement).

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Objective</th>
</tr>
</thead>
<tbody>
<tr>
<td>Detection and diagnosis of a mood disorder using Computerized Adaptive Testing (CAT) [16] and Smartphone-based EMA in a young patient suspected of having a depressive disorder [17].</td>
<td>Evaluate the acceptability of a machine instead of a psychiatrist for making a diagnosis</td>
</tr>
<tr>
<td>Early detection of depressive relapse, using an electronic connected wristband (biosensors) [18] to assess the digital phenotype of a patient with a recurrent depressive disorder in remission</td>
<td>Investigate the psychiatrists' views on the intrusion of a connected object between them and their patients. Investigate their views on the device's ability to intervene preventively (even before the depressive recurrence was manifest)</td>
</tr>
<tr>
<td>Prediction of transition to psychosis in individuals in an at-risk mental state using a machine learning algorithm applied to an MRI [19] or a blood test [20]</td>
<td>Evaluate the acceptability of a machine learning based prediction of disease transition</td>
</tr>
</tbody>
</table>
All the questions were designed during three focus groups including psychiatrists and sociologists, and were tested with cross-validation on a sample of psychiatrists working at Saint-Antoine Hospital in Paris. The first part of the survey (15 questions) collected epidemiological data: sex, job, place of practice, theoretical and practical training (neurobiological, psychoanalytic, integrative, CBT, etc.), workplace, year of graduation, and practice area (adult psychiatry, child psychiatry, forensic psychiatry, etc.). The second part assessed the acceptability of the support systems and the psychiatrists' professional culture, with 15 questions per scenario (total of 60 questions). A blank field allowed us to collect qualitative data in the form of feedback at the end of the survey.

2.3 Assessment of acceptability

The various technologies described above can be studied from a sociological perspective by examining the factors that prevent or, on the contrary, encourage their use. Several dimensions can influence acceptability, including cognitive, cultural, organizational and social aspects, ergonomics, and -specific to medicine- the risk-benefit ratio. All these dimensions were included in an acceptability model specifically developed for the study and inspired by research on Human-Machine Interaction and Management Information Systems, combining the Nielsen, ISO and the Shackel model [28, 29] (see online supplement). The variables most frequently associated with acceptability are usability (i.e., intention to use), supposed usefulness, and reliability (including accuracy, effectiveness and efficiency). Other variables often incorporated in acceptability models include improvement in individual performance, technology responsiveness, and adaptation to the environment or to the user's needs [21-23]. In our model, we assessed four variables (usefulness, usability, reliability and risk), testing several dimensions for each variable (Appendix 4). For each variable, participants responded to the questions on a Likert-like scale ranging from 1 to 6, depending on the item. To gauge the
acceptability of each system, we calculated a composite score with three values (positive: 5-6; intermediate: 3-4; and negative: 1-2).

2.4 Psychiatrists' professional culture

The purpose of each item was to bring out the characteristics of the sociological concept known as “psychiatrists' professional culture”: what made them psychiatrists, with which technologies they would refuse to compromise, how they saw themselves in relation to other specialists. We took two major areas of professional culture into account: first, the psychiatrists’ scientificity level reflected by the use of biometric data, MRI, blood tests and physical examinations (assuming that the more scientifically minded psychiatrists are, the more willing they are to use complementary examinations). Second, we probed the psychiatrists’ specific relationship with technology, by analyzing the hopes and fears generated by these new tools (i.e., did they think that these technologies would help them or replace them?).

2.5 Data collection

The survey was created with Google-Forms® and sent by e-mail to the relevant professionals via several mailing lists (residents’ association, private practice associations, clinical facilities, personal social networks, etc.). Respondents could answer via Internet browser. After a short introductory text, the scenarios appeared one after the other, each followed by the corresponding questions. The survey was anonymous and took about 10-15 minutes to complete.

2.6 Data analysis

We performed an initial descriptive analysis of the population using multiple regression analysis. Comparisons of proportions were carried out using a z test with Bonferroni correction.
Pearson correlation coefficients were used to analyze correlations between variables. The variables were compared with nonparametric chi² tests, or with Fisher’s test when the conditions for chi² application were not met, using Microsoft Excel®, SPSS v24 and R-STAT software. The significance level was set at 5%, such that differences with a \( p \) value < 0.05 were deemed to be significant. In order to achieve 95% statistical power with an alpha risk of 0.05, bibliographic analysis indicated that 374 participants were required (bearing in mind that there were 12570 psychiatrists in France in 2015). Qualitative variables were partially analyzed by LaSA using MODALISA© (not yet published).

## 3. RESULTS

### 3.1 Survey implementation

The survey was available online between 30 June and 8 August 2016. A total of 528 responses were received. Five empty surveys, five duplicates and three incomplete surveys (no responses to at least one whole scenario) were excluded, such that 515 surveys were included in the analysis.

### 3.2 Demographic characteristics (see online data supplement)

The study population was predominantly female (58.1%), mainly composed of young psychiatrists who had already graduated or were set to do so between 2010 and 2020 (66.4%), and the majority of practitioners worked in adult psychiatry (52.4%). Residents made up a large proportion of the sample (46.8%), followed by hospital practitioners (28.7%) and private practitioners (9.5%). The two most common theoretical approaches were “Several approaches focusing on neurobiology or CBT” and “Integrative practice”
3.3.1 Quantitative analysis

Overall acceptability was moderate (Table 2). Positive scores only outweighed negative scores for machine learning. They did not differ significantly for CAT or EMA, and the fewest positive scores were for the connected wristband (Table 1). MRI coupled with ML was considered to be the most useful system, although when asked about reliability, participants gave CAT most positive scores. All the systems were deemed to be potentially risky (41.1%) or risky (38.5%). MRI and blood tests had the most favorable risk profile (i.e., fewest negative scores). For those who responded that there was a risk (potential or real), the main risks were medical (regardless of the technology), then ethical (especially regarding MRI and blood tests) and finally legal (mainly with regard to the connected wristband).

Figure 1. Acceptability
<table>
<thead>
<tr>
<th>Acceptability domains</th>
<th>Technology</th>
<th>Positive score (5-6) %</th>
<th>Intermediate score (3-4) %</th>
<th>Negative score (1-2) %</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Utility</strong></td>
<td>EMA / CAT</td>
<td>25.9</td>
<td>53.4</td>
<td>20.7</td>
</tr>
<tr>
<td></td>
<td>Biosensors</td>
<td>15.3</td>
<td>58.4</td>
<td>26.3</td>
</tr>
<tr>
<td></td>
<td>Machine learning</td>
<td>34.7</td>
<td>51.55</td>
<td>13.75</td>
</tr>
<tr>
<td><strong>Usability</strong></td>
<td>EMA / CAT</td>
<td>17.65</td>
<td>63.7</td>
<td>18.8</td>
</tr>
<tr>
<td></td>
<td>Biosensors</td>
<td>17.7</td>
<td>55.9</td>
<td>26.4</td>
</tr>
<tr>
<td></td>
<td>Machine learning</td>
<td>30.45</td>
<td>54.5</td>
<td>15.05</td>
</tr>
<tr>
<td><strong>Reliability</strong></td>
<td>EMA / CAT</td>
<td>30.05</td>
<td>28.6</td>
<td>9.95</td>
</tr>
<tr>
<td></td>
<td>Biosensors</td>
<td>10.7</td>
<td>52.3</td>
<td>14.8</td>
</tr>
<tr>
<td></td>
<td>Machine learning</td>
<td>13.75</td>
<td>57.15</td>
<td>9.45</td>
</tr>
<tr>
<td><strong>Risk</strong></td>
<td>EMA / CAT</td>
<td>12.3</td>
<td>45.7</td>
<td>42</td>
</tr>
<tr>
<td></td>
<td>Biosensors</td>
<td>18.3</td>
<td>46.8</td>
<td>34.9</td>
</tr>
<tr>
<td></td>
<td>Machine learning</td>
<td>29.6</td>
<td>41.1</td>
<td>29.3</td>
</tr>
<tr>
<td><strong>Average</strong></td>
<td>EMA / CAT</td>
<td>21.47</td>
<td>47.85</td>
<td>22.86</td>
</tr>
<tr>
<td></td>
<td>Biosensors</td>
<td>15.5</td>
<td>53.35</td>
<td>25.6</td>
</tr>
<tr>
<td></td>
<td>Machine learning</td>
<td>27.12</td>
<td>51.07</td>
<td>16.88</td>
</tr>
</tbody>
</table>

*For the Risk domain, positive and negative score were inverted*

### 3.3.2 Qualitative analysis

The qualitative analysis explored the obstacles to the acceptability of these new technologies. There were three major issues emerging from the analysis, with a variable distribution according to different scenarios: medical, ethical and forensic (table 3).
Table 3. Major issues raised by psychiatrists

<table>
<thead>
<tr>
<th></th>
<th>Alteration of the therapeutic relationship</th>
<th>Generating anxious counter-reactions (wearable device, prediction)</th>
<th>False-positive, false-negative</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medical</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ethical</td>
<td>Impact of preemptive antipsychotic treatment</td>
<td>Impact of predicting a potentially incurable disease</td>
<td>Stigmatization risk</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Used to compensate increasing shortages of health professionals in some areas</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Associated in people’s minds with the electronic ankle tagging of prisoners</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Feeling of being controlled</td>
</tr>
<tr>
<td>Forensic</td>
<td>Delegate a monitoring task to a machine</td>
<td></td>
<td>Data privacy</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Medical liability</td>
</tr>
</tbody>
</table>

2.903.3.3 Subgroup analysis

A cross-analysis of the epidemiological data and acceptability profiles was performed to determine the factors associated with the psychiatrists’ professional profiles.

Table 4. Cross-analysis

<table>
<thead>
<tr>
<th>Acceptability</th>
<th>Positive scores</th>
<th>Intermediate scores</th>
<th>Negative scores</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex</td>
<td>Male</td>
<td><em>ns</em></td>
<td>Female</td>
</tr>
<tr>
<td>Theoretical approach</td>
<td>Neurobiological</td>
<td>CBT Integrative Systemic</td>
<td>Psychoanalytic</td>
</tr>
<tr>
<td>Practice</td>
<td>Adult psychiatry</td>
<td><em>ns</em></td>
<td>Child psychiatry</td>
</tr>
<tr>
<td></td>
<td>Addiction medicine</td>
<td></td>
<td>Forensic psychiatry</td>
</tr>
<tr>
<td></td>
<td>Geriatric psychiatry</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Role</td>
<td>Professor</td>
<td>Hospital practitioner</td>
<td>Resident</td>
</tr>
<tr>
<td></td>
<td>Assistant professor</td>
<td>Assistant practitioner</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Private practitioner</td>
<td></td>
</tr>
<tr>
<td>Year of graduation</td>
<td>1990-2009</td>
<td>2010-2015</td>
<td>2016-2020</td>
</tr>
</tbody>
</table>

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2.963.4 Secondary outcome: characterization of psychiatrists’ professional culture
Three questions allowed us to study the place of psychiatrists compared with other medical specialists, in terms of *scientificity*, by probing the importance they gave to physical signs (i.e., biometric data), technology, and algorithmic thinking. These questions made it possible to distinguish between psychiatrists who:

- Make extensive use of biometric data in their practice;
- Give a prominent place to predictability based on algorithms;
- View technology not as replacing them but as playing a complementary role.

They also allowed us to highlight the degree of opposition to these dimensions, including affirming the primacy of the human relationship and the refusal or rejection of technology.

We were able to place psychiatrists on a continuum running from *medical* to *psychological subtype*, and conducted an analysis in which these profiles were crossed with epidemiological data (see online data supplement).

### 4. DISCUSSION

#### 4.1 Principal findings

We achieved our primary objective of determining the acceptability of new technologies by psychiatrists and to our knowledge it is the first study to assess psychiatrists’ views on computerized clinical decision support systems. The CDSS clearly had different acceptability profiles: the connected wristband seemed to have the lowest acceptability profile, CAT and EMA smartphone-based assessment were rated as the most reliable, but with the greatest risk and Machine learning based MRI or blood tests were rated as having the greatest usefulness and usability but the greater risk. Furthermore approximately half of the psychiatrists claimed to wait for (and expected to receive) more scientifically validated arguments before reaching any conclusions. The subgroup analysis showed that acceptability was strongly mediated by
psychiatrist’s profile, and more specifically by sex, theoretical approach, mode of practice, role, and experience. The questions probing the psychiatrists’ professional culture indicated that a certain type of professional culture corresponded to a certain acceptability profile. Our analysis suggests that there were several subgroups, which differed in almost every aspect, with psychiatrists whose professional culture could be defined as medical at one extreme, and those who had a more psychodynamic culture at the other extreme. The question of prediction seems more sensitive for certain categories, especially child psychiatrists and forensics practitioners who are the most reluctant in this area, which illustrates the current important debate on neuroprediction.

The number of usable responses we collected (N = 515) allowed us to have a representative sample of a good size with a geographical distribution that did not influence the data (no significant differences between the regions). Compared with other survey-based studies, this was a large sample, as most studies collect between 50 and 150 responses. The questions were developed in collaboration with sociologists, to ensure the relevance of the data we collected and allow for the construction of a sociological hypothesis. Our analysis allowed us to identify a typology of French psychiatrists that featured two contrasting schools of thought. The use of quantitative data, including ratings on 3- or 6-point scales, allowed us to undertake a relatively fine-tuned analysis. Furthermore the questions were developed from a model specifically adapted to medical technology acceptance and inspired by several valid theoretical models. Qualitative analysis allows us to explore the different fields of acceptability, raising several constraints. The main obstacle was the fear that they would do more harm than good, either by generating anxious counter-reactions (especially with regard to the EMA smartphone app and connected wristband) or by creating a risk of overtreatment by diagnosing problems that “did not exist”. Much of the feedback focused on the third scenario (which had the highest acceptability profile), with questions about which course of action to pursue if the
MRI or the blood tests predicted a transition to psychosis, and pointing out the risk of *jumping to diagnostic conclusions*. Several respondents indicated that they would refuse to introduce a preemptive antipsychotic treatment based on a prediction made in this way. Several commented that there was no point predicting an *incurable* disease. Feedback on the second scenario raised the same questions, with the idea that it is not ethically acceptable for a psychiatrist to delegate a monitoring task to a machine. This technology elicited particular ethical and political considerations, based on the notion that these connected wristbands are associated in people’s minds with the electronic ankle tagging of prisoners, and that they are part of a political agenda, used to compensate for increasing shortages of health professionals in some areas. Regarding the first scenario, some respondents argued that this technology could result in loss of opportunity, especially if it prevented practitioners from diagnosing other problems because the focus was on the system’s diagnosis. Some mentioned the risk of practitioners losing their clinical sensitivity through lack of practice.

### 4.2 Assumptions and recommendations

Significant disparities between devices highlight varying degrees of acceptability, both technology-dependent (previously known technology such as MRI seems better accepted while connected objects are less well-known) and the underlying theoretical presupposition. Thus the prediction of the psychotic transition remains subject to many fears, whereas the computerized questionnaires are not. Paradoxically, it is the MRI coupled with machine learning that psychiatrists find most useful. Furthermore our results lead us to make the assumption that new technologies are challenging the *psychological* subtype of psychiatrist, while consolidating the *medical* subtype. Neurobiological psychiatrists are not challenged by these technologies, which they regard rather as tools that extend or complement their own practice. Regardless of the system, psychiatrists with a psychoanalytic orientation are clearly reluctant, and we suggest that
it is both the use of scales and the technological dimension that account for their negative
stance. This assumption is reinforced by the large number of comments that evoked the
technology’s impact on the therapeutic relationship.

Many ethical issues were raised by this study, and data security, data storage, the piracy risk,
have yet to be resolved. Disease prediction or risk prediction, whether in the case of depressive
relapse or transition to psychosis, is necessarily stressful for patients and brings the risk of
excessive focus and an anxious counter reaction. To offset these risks, it is essential for
psychiatrists to be involved in the development of new technologies, to prevent them from
losing control over them. Developers have a major interest in communicating better about the
design of these tools and the algorithms they want us to use in the future. In order to complete
our research, a comparative study using the same methodology is being developed to better
understand the acceptability of these technologies by patients, nurses and general practitioners.

4.3 Limitations of the study

The main limitation could be tautological in nature, in that the differences we found between
the various acceptability profiles may simply have reflected a difference in theoretical approach
(neurobiological psychiatrists vs. the rest). This suggests that the technologies we studied were
based on a theoretical presupposition that was purely neurobiological. While it is true that the
third scenario had a clear neurobiological emphasis, the same cannot be said for the other two.
In the first scenario, the use of smartphone-based EMA raised the question of scales, but scales
presuppose nothing of the etiopathogenesis of the disorder being assessed. Furthermore, CAT
does not use scales, as it simulates the psychiatrist’s way of thinking by choosing a specific
question from a database made up of more than 500 items. The same applies to the connected
wristband, as biometric data capture only means that some depression symptoms can be
objectified (e.g., psychomotor retardation) a fact that no psychiatrist can refute. It was therefore
not the opposition between neurobiological and psychodynamic issues that was assessed in our study, but the relationship to technology exhibited by different subtypes of psychiatrists.

CONCLUSION

Type of professional culture (theoretical background, practice) appeared to exert a strong influence on the acceptability of the technologies we studied. Overall acceptability was high, but respondents expressed many reservations and raised many ethical and ideological questions, indeed, a probability derived from the analyzed data cannot systematically be transformed into diagnostic or therapeutic certainty. It is surely necessary for psychiatrists to adopt a clear stance with regard to these radical changes that are upsetting traditional practice, and for them to be able to do this, they must be informed, interested, and allowed to contribute to the development of these new technologies, going as far as joining the “disruptors of health sciences” [30]. The acceptability model we developed, using a complex sociological methodology featuring clinical case scenarios intended to elicit emotional responses, needs to be replicated.

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Conflicts of interest

The authors have no conflict of interest

Ethical approval and patient consent

This paper is not about a study that includes patients. Therefore, it was not submitted to an ethics committee.

Author contribution statements

AB and SM designed the study and performed the analytic calculations.

AB and FF wrote the manuscript.

LO and CG performed the qualitative analysis. Both contributed to the theoretical sociological background.

CP helped supervise the project and contributed to the editing.

SM conceived the original idea and was in charge of overall direction and planning.

All authors discussed the results and contributed to the final manuscript.

References


