



# INVESTIGATING SMART PHONE ADDICTION: INSPECTION FROM TELEMETRIC BEHAVIORAL MEASURES OF YOUNG PEOPLE

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**ABSTRACT:** The vital development of telecom technology has a profound impact on the lives and activities of people irrespective of their ages, especially young people. This study examined smart phone user behaviour in relation to self-reported smart phone addiction. Thirty-four fresh users of smart phones logged all phone use over the course of the six months-long study. At the conclusion of the study, users were asked to rate their level of addiction to the device. Sixty-six percent agreed or strongly agreed that they were addicted to their smart phone. These users showed an uncontrolled use of smart phones as compared to those users who did not sign as an addicted. Addiction made them fail attempts to cut back on consistently using smart phones or, in most instances, be seen with their phones, either chatting away, being on call, or using some random surfing or the other social sites, and the Web drove this use. Unexpectedly, it is Games that illustrated no divergence amid addicts and non-addicts users. Addicted users showed significantly lesser time-per-interaction than did non-addicted users to social relations and outdoor activities. Two addicted users reported that they were facing a problematic level of addiction, and their use data was beyond three standard deviations from the upper hinge. The implications of the relationship between the self-reported and logged data are discussed ahead in the current study.

**Keywords:** Smart phone, Addiction, young people's behaviors, signs

**INTRODUCTION:** Mobile phones have become an important component; it is not be exaggeration to say that, most important aspect, of everyone's life, whether they are young, teenager, or adult; everyone is engrossed in their phone. Mobile phones are used at any time, any location, and by everyone to conduct their business, in case of emergency, social networking with friends, have fun, and even to express oneself, thanks to their widespread use and high penetration. Mobile phones were created for the convenience and comfort of individuals, as well as for their prosperity, security, and benefit.

According to an old adage, everything has two faces: good and terrible, and the cell phone is no exception. Using a cell phone is not harmful, but excessive usage of anything is. Simply having a high-tech smart phone in the present times and age does not qualify as a mobile phone. Simple mobile phones are included in the definition as well, because we all know that the introduction of the cellular phone was accompanied by the introduction of simple mobile phones. People who use simple phones are clearly addicted to them, as seen by the fact that they become agitated and angry if they appear to have misplaced or lost them. Excessive usage of mobile phones, or spending the majority of one's time on them, has a negative influence on a person's mental and social health. Individuals have acquired a new type of addiction known as mobile phone addiction as a result of their excessive use of mobile phones. And believe me when I say that this addiction is even worse than any other.

Present study explored the smart phone addiction, especially of the young people users (17 years to 24 years) from their self reported behavior and connection to their smart phones.

## Definition and prevalence of Smart phone Addiction

Some experts believe that problematic Smart phone use is a sort of psychological or behavioral dependence on cell phones, and that it is closely linked to other forms of digital media addiction, such as social media addiction or internet addiction disorder. The smart phone has become an essential part of daily life and research has shown that certain people become so attached to their device that they experience separation anxiety when it is not with them (**Cheever, Rosen, Carrier, & Chavez, 2014; King et al., 2013**). The American Psychiatric Association (APA, 2013) was the first to classify a behavior – gambling – as a non-substance-related addiction illness and to advocate for more research into Internet gaming disorder.

## Young peoples and Smart phone Addiction

According to a study conducted by doctors, nearly a quarter of young people are so reliant on their smart phones that it has become an addiction. According to the study from King's College London, people who are addicted to something become "panicked" or "upset" if they are refused constant access. They also have little control over how much time they spend on the phone. The report warns that such addictions have "severe mental health effects." The study, which was published in the journal BMC Psychiatry, looked at 41 studies involving 42,000 young people as part of an inquiry of "problematic smart phone usage."

According to the study, 23% of those surveyed displayed symptoms of addiction, such as concern over not being able to use their phone, inability to manage their time spent, and excessive usage of mobile phones that interfered with other activities.

The goal of this study was to fill that gap by conducting a naturalistic and longitudinal examination of Smart phone Addiction utilizing a hybrid strategy that included survey and telemetric data. Over the course of six months, we studied 34 college students and how they utilized their smart phones. All of their actual usage was recorded using an unassuming in-device logger in order to uncover trends related with potentially addictive technology behaviours. These figures were supplemented by survey responses in order to better understand each user's (self-perceived) addiction levels and how they reflected in legitimate-world habit patterns.

## REVIEWS OF RELATED LITERATURE

Excessive Internet use or Internet addiction is becoming more common in our technologically aware population, according to mental health doctors. Internet addiction has been studied extensively by researchers in China, Taiwan, and Korea. There are screening tools available to determine the prevalence and level of Internet addiction. Anxiety, sadness, conduct disorder, and attention deficit hyperactivity disorder (ADHD) are all common mental problems related with internet addiction. Individual and group therapies, cognitive behavioural therapy (CBT), family therapy, and psychotropic drugs are among the treatment options. A significant proportion of Singapore adolescents who use the Internet excessively are also diagnosed with Internet addiction. Despite the availability of a number of therapeutic methods, more study is needed in this area to address the growing trend and reduce the negative psychological and social effects on individuals and their relations (**Say How Ong, 1 MBBS, MMed (Psychtry), FAMS, Yi Ren Tan, 1 BA (Psychology)**).

**Is smart phone addiction really an addiction ?** The goal of this paper was to review the relevant literature on the topic of smart phone addiction and determine whether this disorder exists or if it does not adequately satisfy the criteria for addiction, given the rise in research on technological addictions in general and smart phone addiction in particular. To determine the applicability of the label "addiction" to excessive and problematic smart phone use, evaluated by quantitative and qualitative studies on smart phones addiction and analyzed their methodologies and results. Despite the fact that the majority of studies in the field says that cellphones are addictive or assumes that smart phone addiction exists, we could not uncover enough evidence from an addiction perspective to prove the presence of smart phone addiction at this time. The behaviours identified in the study are more accurately described as problematic or maladaptive smart phone use, with repercussions that are not as severe as those induced by addiction (**Tavana Panova<sup>1,\*</sup> and Xavier Carbonell**).

Mobile phones have become an indispensable component of everyone's everyday routine. Humans' use of mobile phones has resulted in both benefits and drawbacks for them. Many people experience psychological issues as a result of their excessive use of mobile phones. As a result, the current study was carried out (**Kaukab Imam1, Shamim A Ansari2**) to determine the extent of mobile phone addiction and the association between such addiction and anxiety. Purposive sampling procedures were used to choose a sample of 100 Ph.D. research scholars (70 men and 30 women) from Aligarh Muslim University. The Mobile Phone Addiction Scale (MPAS) and Beck's Anxiety Inventory were used to collect data (BAI). The findings revealed that there is a generally favourable association between mobile phone addiction and anxiety, however it is not particularly strong. Male scholars were shown to have a moderate level of addiction, whereas female scholars had a high level of addiction.

However, the term addiction has moved a long way behind the substance abuse and have accommodated several psychological addiction such as compulsive gambling (Griffiths, 1990), video game playing (Keepers, 1990), exercise (Morgan, 1979), Love relationships (Peele and Brodsky, 1975).

It has drawn a good crowd to its service providers in India, 755 of the adolescents whose age ranges from 12-17 years own a smart phone and India is the world's second largest telecom industry (Krithika. M, Dr. S. Vasantha, 2013). Descriptive research design is the tool used to conduct the research. Stratified random sampling was only obtained for a few selected students in South Chennai, Tamil Nadu, India, from a non-probability sampling process. Percentage analysis, chi-square, factor analysis, T-test analysis are instruments and techniques that were used during the course of the study. In the recent years cell phones, pocket laptops and other technologies gained huge recognition and have also conquered our lives in the present (Kumiko Aoki, Edward J. Downes, 2003).

## RESEARCH QUESTIONS

Two key issues were investigated in the present study:

To begin, what is the relationship between self-reported smart phone addiction and monthly smart phone use?

The second question is whether it is possible to assess addictive behaviours using logged (telemetric) data?

## HYPOTHESIS TESTING

We expected that self-described addicts and non-addicts would exhibit distinct patterns of device use, with addicts using their devices more frequently and for longer periods of time.

## METHODOLOGY

**SAMPLING TECHNIQUE:** Using naturalistic and longitudinal usage data collected over a six-months period, this study used a quasi-experimental research design.

### PRIMARY DATA

- **Participants**

A total of 34 students (19 males and 15 females) took part in the study. The academic majors, socioeconomic levels, and ethnicities of these pupils were all diverse. The other 24 students attended Agra University in Agra, and ten of the participants attended a degree college in Firozabad U.P. (west). We picked-up students those who had never used a smart phone as a control group to ensure that they had no prior experience with the gadget. All of the participants, on the other hand, had a laptop and utilized the same frequently for their collegiate studies.

- **Materials and Measures**

Ensured that each subject has access to a smart phone for the duration of the six-month research period on each smart phone, a bespoke logger [22] was installed as a background process that did not stop use. Every night, data was gathered remotely with no user engagement. All application launches, their length, and when they occurred (i.e., date/time stamps) were part of the data we gathered. More data was gathered from a variety of apps, including the amount of text messages sent/received, URLs viewed via Google chrome, and the number of contacts in each participant's contacts programme. To avoid privacy issues, the majority of the social data collected (contacts, text messages, emails, phone conversations, etc.) was obfuscated. At the conclusion of the six-month trial, the Smart phone Addiction Measurement Instrument (SAMI) developed by Tossell et al., 2015 was used.

A 15-question survey designed after the Cellular Phone Addiction Scale (CPAS; and Internet Addiction Test (IAT); was administered (Table 1). On a 5-point Likert scale ranging from never (1) to always (5), participants scored each item (5). The IAT is a widely used test

that has been psychometrically validated across cultures. It's worth noting that both scales are a little out of date, thus the authors had to make some significant alterations to the goods. The survey also contained open-ended and yes/no questions to aid in the interpretation of some of the logged data and to better understand the nature of any claimed addiction. To reduce participant response, we avoided introducing novel interfaces, enthusiastic and self tasks, and research-related meetings throughout the trial.

**SECONDARY DATA:** Data was collected from various journals, articles magazines, wikipedia and other websites.

**STATISTICAL ANALYSIS**– It has been doing through Pearson's product moment correlation to analyze the data, tables and graphs were also used to explain or clarify the data; using SPSS software.

## DELIMITATIONS

- The study is not appropriate to generalize or not completely represent to a larger population of the smart phone users in reference of their context of use, due to small sample size ( 34 respondents).
- The study also limited to only college students, who are indeed, an especially susceptible group to this form of addiction [20,21].
- The telemetric usage data reported here, on the other hand, provides greater accuracy and depth than conventional survey-based studies, which helps to counteract the small sample size [19]. The sample size was also significant enough to identify variations across groups.
- In this study we did not ask for estimates of quantifiable behaviours (e.g., "How often do you check your message per day?") since those records were attained by the gadget itself. Rather, we asked more qualitative questions that necessitate human interpretation (e.g., "Is it actually tough to switch off your phone?").
- We make no clinical claims for smart phone addiction because it is not currently listed in the DSM-5, but instead rely on its colloquial use as a frequent portrayal of behaviours that are both reinforcing and possibly problematic.
- To end with, we employ the word, "smart phone addiction" in this research since it is commonly used in the literature to describe excessive usage of technology. Indeed, the word addiction appears in the titles of the assessment scales used to quantify this misuse [17,18].

## PROCEDURE

First proper rapport was developed between the researcher and the participants, their questions about the research were answered thoroughly, and they were assured that their identities would be kept completely confidential, and the data would be used solely for research purposes and would not be tampered with or misused. Ensured that each participant has its own smart phone for the next six months after completing an IRB-approved consent form. Participants were given no instructions regarding the use of their smart phones, nor they had any knowledge about our intention of exploring their activities. Other than the fact that we were recording their usage data in an anonymous manner to better understand smart phone usage. We administered the addiction survey at the end of the six-month period.

## RESULT

Twenty-two (22) of the thirty-four (34) participants (65%) agreed or strongly agreed that they were addicted to their smart phones. We called this group "SR" for Self-reported Addiction after grouping these users together based on their agreement to at least some level of smart phone addiction. Of these 22 respondents, 13 were male and nine were female. The remaining 12 people (known as NAs for Non-Addicts) did not agree that they were addicted to their smart phones on any level (i.e., strongly disagreed, disagreed, or neither agreed nor disagreed). Six of the users were men, while the remaining six were women. Within either of these categories, we found no significant variations in demographic trends.

One person in the SR group thought his addiction was an issue, and his consumption data was regarded outlier, as we'll explain below. His data was omitted from the SR/NA comparisons, but we focused on his usage in a separate section. Every other SR user claimed that his or her addiction was not a problem.

There were no differences in many of the goods. Participants, for example, acknowledged that their smart phones were difficult to turn off once turned on and that they were good for withdrawal/escape. SRs differed from NAs on several SAMI items, primarily in their perception of their ability to control the desire to check their devices and their desire to spend as much time on the device as possible (Table 1). When SRs couldn't turn on their gadgets or check their preferred app, they felt more anxious.

### 1. Discrepancies in usage as recorded

Table-2 described the variation of usage behavior was seen between both self-reported addicts and non-addicts. Though there were no considerable differences between both kind of above mentioned users in installing the number of applications; but SRs shown double concern with smart phone use, a loss of sense of time is portrayed by excessive usage of smart phone; turns to cell phone when experiencing unwanted feelings such as anxiety or depression (practically often triple folds) compared to non-addicts group. Self-reported addicts felt withdrawal, when cell phone or network is unreachable.

### \*ADDICTION QUESTIONS AND RESPONSES BY SELF-REPORTED ADDICTED {SR} AND NON-ADDICTED {NA} INDIVIDUALS RESPONSE ARE ON A LIKERT'S FIVE POINT SCALE\*

TABLE-1

	ADDICTED		NON-ADDICTED		P*
	M	SD	M	SD	
<b>Inability to Control Craving</b>					
You have been told that you have spent so much time on the smart phone	4.12	1.0	3.91	1.89	0.90
You find yourself engaged on smart phone for longer period of time than intended	3.30	1.26	3.47	1.01	0.92
You can never spend enough time on your phone	3.24	1.42	2.1	1.35	<0.001
You have attempted to spend less time on the smart phone, but are unable to	3.18	1.52	2.37	1.68	0.003
You can control when you check applications	2.72	0.37	3.93	1.82	<0.001
Checking smart phones satisfies your recurring urges	3.03	0.74	1.99	1.04	<0.001
<b>Feeling Anxious and Lost</b>					
You experience discomfort when your phone is running out of battery life	3.31	0.59	3.24	0.37	0.89
You feel anxious if you have not checked a favourite app or switched on your phone for sometime	3.94	0.89	1.89	0.58	<0.001
You find it difficult to switch off your phone.	3.8	1.04	3.29	0.80	0.08
You feel lost without your smart phone.	2.18	1.95	2.02	1.19	0.71
<b>Withdrawal/Escape</b>					
You have used your smart phone to communicate to others when you feel lonely	3.98	1.34	3.74	1.07	0.58
Your smart phone is your consistent companion	3.62	1.13	3.25	1.21	0.47
You have used your smart phone to make yourself feel better when you feeling down	1.33	0.79	1.23	0.77	0.94
You often fill your dead time with smart phone use	3.93	1.07	3.44	0.79	0.07

Some applications were classified by category to help comprehend the distinctions between Addicted and Non-Addicted. All gaming applications, for example, were merged. According to our logged data, a small fraction of highly-used programmes was used more by SRs, as demonstrated by independent t-tests with Scheffe adjustments for multiple comparisons (Table 2). In comparison to NAs, SRs launched Instagram, Facebook, Chat, and Web surfing far more frequently, and spent much more time on Instagram, Facebook, Amusement (like tik-tok etc), and Web surfing.

Although Addicts and Non-Addicts differences in the duration of game use approached the .05 alpha significance level ( $p = .06$ ), applications within categories such as Study and Games did not discriminate user groups. Time per Interaction (TPI) rates for Instagram, Facebook, Web surfing, and Chats applications were analyzed for each user in order to better understand how four of these specific



applications were accessed longitudinally. Lower TPIs indicate that an application is used for a shorter period of time and is launched more frequently. Longer duration usage with fewer application launches, on the other hand, would result in a higher TPI (TPI = Time in Secs / No. of Launches). There is no difference between NAs and SAs for Google TPI (p=.63), whereas for Instagram (p=.015), Facebook (p.001), and Chats (P.001), NAs have a higher TPI than SAs. Table-1 depicts TPIs over the course of the trial.

**FOR ADDICTS AND NON-ADDICTS STUDENTS, USAGE DATA MEAN DIFFERENCES AND STANDARD DEVIATIONS (\*FOR MULTIPLE COMPARISONS, SCHEFFE HAS BEEN ADJUSTED)**

TABLE-2

	SRs		NAs		p*
	M	SD	M	SD	
<b>Hours/Week</b>	<b>8.04</b>	<b>4.14</b>	<b>4.34</b>	<b>4.82</b>	<b>&lt;0.001</b>
<b>App Launches/Week</b>	<b>1059.57</b>	<b>288.02</b>	<b>593.01</b>	<b>249.88</b>	<b>0.001</b>
<b>Instagram Min./Week</b>	47.03	22.98	28.08	15.56	0.03
<b>Instagram Launches/Week</b>	61.02	43.86	32.03	19.58	0.04
<b>Chats- Min/Wk</b>	162.05	93.56	118.98	80.26	0.19
<b>Chats- Lch/Wk</b>	190.03	99.98	87.56	47.02	0.004
<b>Facebook Min/Week</b>	77.58	50.98	24.87	23.18	0.008
<b>Facebook Launches/Week</b>	45.98	29.88	21.02	22.58	0.03
<b>Games-Mn/Wk</b>	103.98	106.58	80.97	94.28	0.06
<b>Games-Lch/Wk</b>	14.78	12.20	19.24	32.96	0.66
<b>Amusement Min/Week</b>	6.02	10.22	15.87	15.42	0.04
<b>Amusement Launches/Week</b>	6.45	9.96	1.56	1.12	0.09
<b>Study- Min/Wk</b>	2.96	1.45	2.16	3.35	0.40
<b>Study- Lch/Wk</b>	2.34	1.56	1.98	1.08	0.65
<b>Web- Min/Wk</b>	70.82	36.73	32.98	34.27	0.01
<b>Web- Lch/Wk</b>	35.02	17.58	15.63	12.29	0.005

FIGURE-1

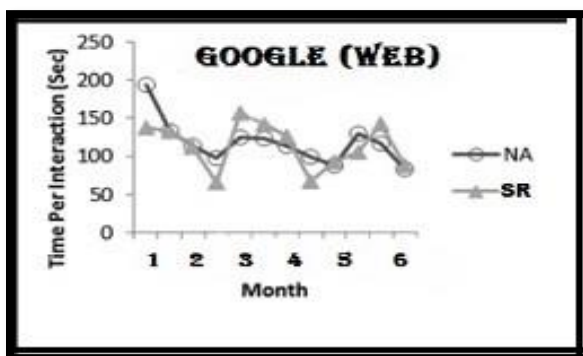


FIGURE-2

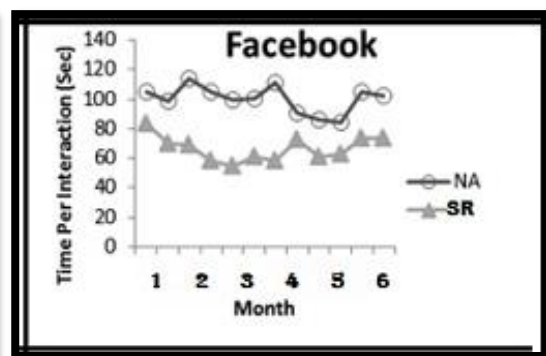


FIGURE-3

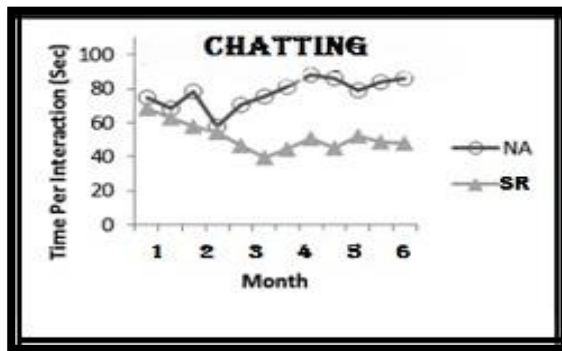


FIGURE-4

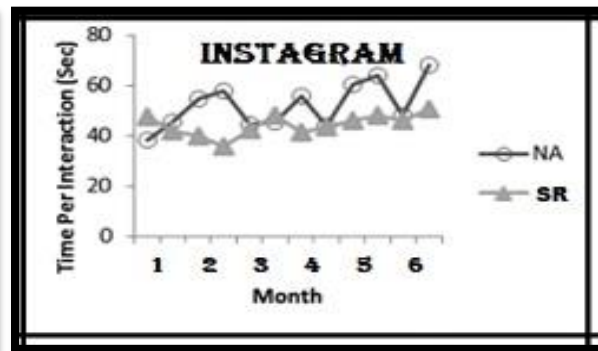


Figure 1, 2, 3 and 4 Above graph shows Time Per Interaction ( in secs.) by months for Google, facebook, Chatting and Instagram applications respectively.

## 2. Addiction as the problematic level

Even though there was a lot of variation among users, the two participants, who said they had a problem with smart phone use were well beyond three standard deviations from the upper limit in terms of usage volume. This respondents said that checking their phone was an uncontrollable impulse, and that they two spent an average of 19 hours on the internet, gaming, and entertainment, as well as launching various apps. During the course of the study, these few sites were visited over 3500 times (approx. 8.4 visits per day). Initiated pretty much instantly after the phones were handed. The participant's rate of sending and receiving text messages was the most startling. All these six months, this participant averaged 300 plus messages sent to and fro and answered per day (using multiple chatting applications). Its usage was limited to a few particular sites (one of them was adult-prone).

## DISCUSSION

After examining six months of smart phone usage, it was discovered that more than half of our participants admitted to having a phone addiction to some degree. These users reportedly spent far more time on their smart phones than those who were not addicted. Furthermore, they used the device twice as much as their Non-Addicted counterparts. At a high level, this research reveals that users who used their phone more frequently and for longer periods of time are aware of their addictive behaviour but did not consider it as an issue. Other study [14] backs up this conclusion. It's possible that this will lead to regular usage patterns that are difficult to change over time. This, according to participant reports, is attributed to habitual checking practices. We are incapable to say with certainty what's causing the disparities in TPI rates in these most popular apps and particular sites. Lower TPIs, on the other hand, appear to be an essential indicator of smart phone addiction. This is a form of unintentionally reflexive and recurrent action. (15,16).

These self-reported Addicts would compare their constant monitoring of the phone to keeping up with a chat in a room full of friends. This could also mean that SRs were simply more socially engaged than NAs. It may be claimed that the SR users in this investigation were not attracted to these applications at all, but rather had a (normal) need to stay in touch with their friends, and that NAs had no such social requirements. The smart phone appeared to be a gateway to appealing information rather than the source of the addiction, akin to prior studies on internet addiction [13]. The troubled respondents claimed that checking their device relieved an overwhelming impulse, but all Addicted participants had some amount of this tendency. In other ways, it appeared that the smart phone was not the root of the addiction, but rather the content to which the smart phone allowed access.

Our findings suggest that continual access could allow for more compulsive dependence in a broader number of contexts. Previously, addictions could only be gratified at a personal computer (desktop), but today they may be fulfilled whenever and wherever the impulse strikes. Although the advantages of these technologies for human support are well known (e.g., in education [11] and medicine [12]). The fair phase of the phones should not be ignored that both non-addicted and addicted respondents account their phones were compliant to plug dull time, stay in contact with their social set of connections when feeling lonesome, and perform as their constant escort. The cell phones provide access to helpful resources in several contexts, in addition to addictive content, that can be supportive for an extensive sort of challenging conducts and thoughts.

## CONCLUSION

Hence, it is concluded that as we investigated the subject of smart phone habit utilizing an arising naturalistic and longitudinal telemetric approach. All these information ought to be decoded with alert because of the little example size and possibly weaker segment. In any case, this study gives an initial look into the habit-forming nature of smart phones as shown by genuine use information joined with review information. Future examinations, with bigger example sizes, ought to utilize a psychometric way to deal with comprehend the idle builds that underlie these ways of behaving, the social profiles of SAs, and the mental outcomes of having an obsessive degree of cell phone fixation. Associating psychometric information with explicit parts of cell phone utilization is by all accounts a fascinating way ahead. At long last, this examination brings up specific issues about future headings for clinical brain science. Should innovation and examination be utilized to help foresee and treat conduct issues? It may be the case that these sorts of investigation gathered from a cell phone could be utilized to analyze or anticipate the beginning of specific problems and give mediations and medicines.

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