Lampiran 1

TABEL ANALISIS JBI FOR CRITICAL APPRAISAL CHECKLIST FOR ANALYTICAL CROSS SECTIONAL STUDIES

No	Pernyataan	Jurnal 1	Jurnal 2	Jurnal 3	Jurnal 4	Jurnal 5
1	Apakah Kriteria untuk dimasukan dalam sample didefinisikan dengan jelas?	Ya	Ya	Ya	Ya	Ya
2	Apakah Subyek Penelitian dan Pengaturannya	Ya	Ya	Ya	Ya	Ya
3	Apakah Paparan diukur dengan cara yang valid dan dapat diandalkan	Ya	Ya	Ya	Ya	Ya
4	Apakah Objektif kriteria standar digunakan untuk pengukuran kondisi ?	Ya	Ya	Ya	Ya	Ya
5	Apakah Faktor Perancu Didefinisikan?	No	No	No	No	No
6	Apakah Strategi untuk menangani	No	No	No	No	No

	faktor perancu dinyatakan					
7	Apakah hasil diukur dengan cara yang valid dan dapat diandalkan?	Ya	Ya	`Ya	Ya	Ya
8	Apakah Analisis statistik yang sesuai digunakan?	Ya	Ya	Ya	Ya	Ya

Lampiran 2

1. *Literature Riview:* Hubungan *antara kesepian dengan adiksi smartphone pada siswa SMA NEGERI 2 BEKASI*

Instrumen Joanna Briggs Institut (JBI)

Critial Appraisal Cheklist for Analytical Cross Sectional Studies

Rewiewer : Susanti Pitri Handayani

Date : Juli 2017

Author : Angga wirajaya subagio, Farida hidayanti

Year : 2017

Record Number : ISSN 2548-1800 1693-2552

	Yes	No	Unclear	Not Appicable
1. Aapakah Kriteria untuk dimasukan sample didefinisikan dengan jelas.	√			
2. Apakah subyek penelitian dan pengaturannya dijelaskan secara rinci?	√			
3. Apakah paparan dukungan dengan cara yang valid dan dapat diandalkan?	√			
4. Apakah Obyektif, kriteria standar digunakan untuk pengukuran kondisi?	√			
5. Apakah factor Perancu didefinisikan?		√		
6. Apakah Strategi		√		

untuk menangani factor perancu dinyatakan?				
7. Apakah Hasil diukur dengan cara yang valid dan dapat diandalkan?	√			
8. Apakah analisis statistic yang sesuai digunakan?	√			

2. Literature Riview: Linking loneliness, Shyness, Smartphone Addiction symtoms, and Patterns of Smartphone use to social capital

Instrumen Joanna Briggs Institut (JBI)

Critial Appraisal Cheklist for Analytical Cross Sectional Studies

Rewiewer : Susanti Pitri Handayani

Date : Juli 2020

Author : Mengwei Bian, Louis Leung

Year : 2014

Record Number : DOI 10.1177/0894439314528779

	Yes	No	Unclear	Not Appicable
1. Aapakah Kriteria untuk dimasukan sample didefinisikan dengan jelas.	√			
2. Apakah subyek penelitian dan pengaturannya dijelaskan secara rinci?	√			
3. Apakah paparan dukungan dengan cara yang valid dan dapat diandalkan?	√			
4. Apakah Obyektif, kriteria standar	√			

digunakan untuk pengukuran kondisi?				
5. Apakah factor Perancu didefinisikan?		√		
6. Apakah Strategi untuk menangani factor perancu dinyatakan?		√		
7. Apakah Hasil diukur dengan cara yang valid dan dapat diandalkan?	√			
8. Apakah analisis statistic yang sesuai digunakan?	√			

3. *Literature Riview: Loneliness, Individualism, and Smartphone Addiction Among International Students in China*

Instrumen Joanna Briggs Institut (JBI)

Critial Appraisal Cheklist for Analytical Cross Sectional Studies

Rewiewer : Susanti Pitri Handayani

Date : Juli 2020

Author : Qiaolei Jiang, Yan Li, dan Volha Shypenka

Year : 2018

Record Number : DOI : 10.1089/cyber.2018.0115

	Yes	No	Unclear	Not Appicable
1. Aapakah Kriteria 2. 3. untuk dimasukan sample didefinisikan dengan jelas.	√			
4. Apakah subyek penelitian dan pengaturannya dijelaskan secara rinci?	√			

5. Apakah paparan dukungan dengan cara yang valid dan dapat diandalkan?		√		
6. Apakah Obyektif, kriteria standar digunakan untuk pengukuran kondisi?		√		
7. Apakah factor Perancu didefinisikan?	√			
8. Apakah Strategi untuk menangani factor perancu dinyatakan?	√			
9. Apakah Hasil diukur dengan cara yang valid dan dapat diandalkan?	√			
10. Apakah analisis statistic yang sesuai digunakan?	√			

4. *Literature Riview: Smartphone addiction and its relationship with social anxiety and loneliness*

Instrumen Joanna Briggs Institut (JBI)

Critial Appraisal Cheklist for Analytical Cross Sectional Studies

Rewiewer : Susanti Pitri Handayani

Date : Juli 2020

Author : Asli enez dacin, Samet cose, Cemal onur noyan dkk

Year : 2016

Record Number : DOI/10.1080/0144929X.2016.1158319

	Yes	No	Unclear	Not Appicable
1. Aapakah Kriteria untuk dimasukan sample	√			

didefinisikan dengan jelas.				
2. Apakah subyek penelitian dan pengaturannya dijelaskan secara rinci?	√			
3. Apakah paparan dukungan dengan cara yang valid dan dapat diandalkan?	√			
4. Apakah Obyektif, kriteria standar digunakan untuk pengukuran kondisi?	√			
5. Apakah factor Perancu didefinisikan?		√		
6. Apakah Strategi untuk menangani factor perancu dinyatakan?		√		
7. Apakah Hasil diukur dengan cara yang valid dan dapat diandalkan?	√			
8. Apakah analisis statistic yang sesuai digunakan?	√			

5. *Literature Riview: Smartphone Addiction, Loneliness, Interpersonal Relationship And Quality Of Life In Adolescents And Adults*

Instrumen Joanna Briggs Institut (JBI)

Critial Appraisal Cheklist for Analytical Cross Sectional Studies

Rewiewer : Susanti Pitri Handayani

Date : Juli 2020

Author : Hepti Mulyati dkk

Year : 2020

Record Number : ISSN 2056-5429

	Yes	No	Unclear	Not Appicable
1. Aapakah Kriteria untuk dimasukan sample didefinisikan dengan jelas.	√			
2. Apakah subyek penelitian dan pengaturannya dijelaskan secara rinci?	√			
3. Apakah paparan dukungan dengan cara yang valid dan dapat diandalkan?	√			
4. Apakah Obyektif, kriteria standar digunakan untuk pengukuran kondisi?	√			
5. Apakah factor Perancu didefinisikan?		√		
6. Apakah Strategi untuk menangani factor perancu dinyatakan?		√		
7. Apakah Hasil diukur dengan cara yang valid dan dapat diandalkan?	√			
8. Apakah analisis statistic yang sesuai digunakan?	√			

Lampiran 3

JURNAL 1

Systematic review title: Hubungan *antara kesepian dengan adiksi smartphone pada siswa SMA Negeri 2 Bekasi*

Participants : 139 siswa

Phenomena of interest : pengguna *smartphone* usia 18 sampai 24 tahun menghabiskan lebih banyak dibandingkan usia lainnya, dengan penggunaan rata-rata 5,2 jam.

Context : Siswa

(temuan sintesis)	(jenis penelitian)	(keteguhan/hal yang dapat dipercaya)	(kepercayaan)	(score conseptual)	Komentar
Hasil penelitian menunjukan bahwa semakin tinggi kesepian maka semakin tinggi adiksi Smartphone. Nilai efekktif kesepian terhadap adiksi smartphone sebesar 3,6% dan sisanya sebesar 96,4%.	Sampel penelitian berjumlah 193 siswa. Teknik sampling yang digunakan adalah teknik cluster random sampling. Alat pengumpul data yang digunakan	Tinggi *(high)*	Seluruh pertanyaan 6 – Ya 2 –Tidak	Tinggi *(High)*	JBI grade recomendasi berdasarkan FAME termasuk kategori A. Pantas untuk diaplikasikan atau diterapkan. *(unequivocal).*

	yaitu Skala Kesepian (26 aitem valid, α = 0,868) dan Skala Adiksi Smartphone (26 aitem valid, α = 0,859). Analisis data menggunakan analisis regresi sederhana.				

JURNAL 2

Systematic review title: *: Linking loneliness, Shyness, Smartphone Addiction symtoms, and Patterns of Smartphone use to social capital*

Participants : 438 responden

Phenomena of interest : orang-orang dicina kurang memperhatikan dengan siapa mereka secara langsung da memanjakan diri dengan smartphone mereka.

Context : Mahasiswa

(temuan sintesis)	(jenis penelitian)	(keteguhan/hal yang dapat	(kepercayaan)	(score conseptual)	Komentar

		dipercaya)			
Hasil menunjukkan bahwa semakin tinggi seseorang mendapat nilai dalam kesepian dan rasa malu, semakin tinggi kemungkinan seseorang akan kecanduan smartphone	Secara total, 438 mahasiswa internasional secara sukarela berpartisipasi dalam survei tersebut. Peserta berasal dari 67 orang negara dan telah belajar di China selama berbulan-bulan	Tinggi *(high)*	Seluruh pertanyaan 6 – Ya 2 –Tidak	Tinggi *(High)*	JBI grade recomendasi berdasarkan FAME termasuk kategori A. Pantas untuk diaplikasikan atau diterapkan. *(unequivocal).*

JURNAL 3

Systematic review title: *Smartphone addiction and its relationship with social anxiety and loneliness*

Participants : 3677 responden

Phenomena of interest : sesorang yang kesepian cenderung mengalami smartphone addiction.

Context : Remaja

(temuan sintesis)	(jenis penelitian)	(keteguhan/hal yang dapat dipercaya)	(kepercayaan)	(score conseptual)	Komentar

Hasil penelitian menunjukan bahwa terdapat hubungan yang signifikan penggunaan *Smartphone Addiction* terhadap kecemasan sosial dengan nilai *p value* 0,001 (< 0,05)	*Eksperimental*	Tinggi *(high)*	Seluruh pertanyaan 6 – Ya 2 –Tidak	Tinggi *(High)*	JBI grade recomendasi berdasarkan FAME termasuk kategori A. Pantas untuk diaplikasikan atau diterapkan. *(unequivocal).*

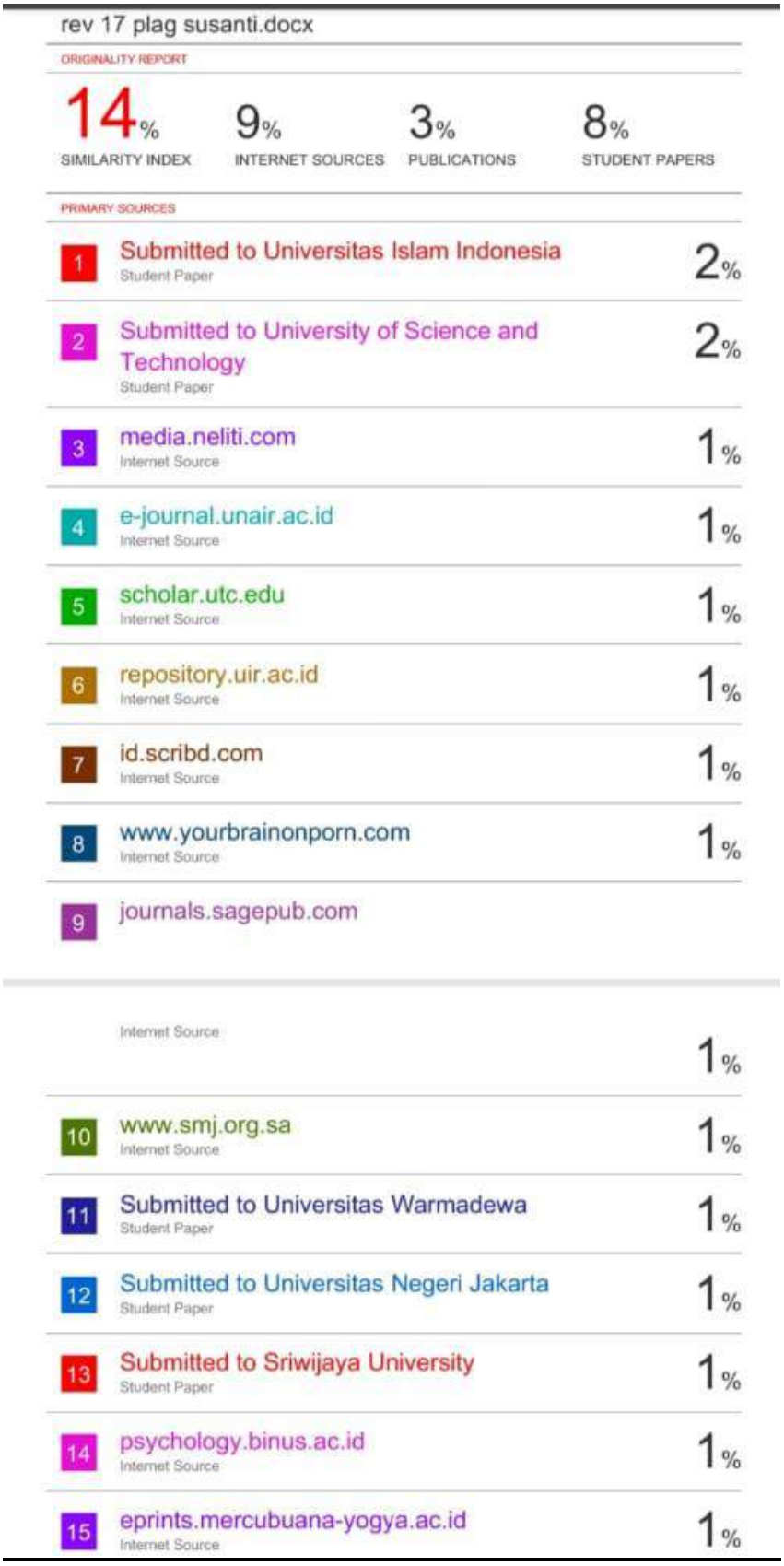
JURNAL 4 *Systematic review title*: *Smartphone Addiction, Loneliness, Interpersonal Relationship And Quality Of Life In Adolescents And Adults* *Participants* : 200 Responden *Phenomena of interest :* di Pakistan penggunaan ponsel pintar sangat kuat berpadu dengan tindakan anak muda yang menjadi indikasi kecanduan sosial. *Context* : Remaja					
(temuan sintesis)	(jenis penelitian)	(keteguhan/hal yang dapat dipercaya)	(kepercayaan)	(score conseptual)	Komentar

Hasil penelitian menunjukan bahwa tidak terdapat hubungan yang signifikan penggunaan *Smartphone Addiction* terhadap kualitas hidup pada remaja dan dewasa dengan nilai *p value* 0,07 (> 0,05)	Korelasional	Tinggi *(high)*	Seluruh pertanyaan 6 – Ya 2 –Tidak	Tinggi *(High)*	JBI grade recomendasi berdasarkan FAME termasuk kategori A. Pantas untuk diaplikasikan atau diterapkan. *(unequivocal).*

JURNAL 5 *Systematic review title*: Loneliness, Individualism, and Smartphone Addiction among international students in China *Participants* : 438 responden *Phenomena of interest :* para pelajar internasional di cina dengan tingkat individu yang rendah menunjukan tingkat kesepian yang lebih tinggi. *Context* : Remaja					
(temuan sintesis)	(jenis penelitian)	(keteguhan/hal yang dapat dipercaya)	(kepercayaan)	(score conseptual)	Komentar

Hasilnya menunjukkan siswa internasional di Cina sebagai populasi berisiko tinggi untuk kesepian parah dan kecanduan smartphone, dengan 5,3 persen peserta mengalami kesepian yang parah dan lebih dari separuh peserta menunjukkan gejala kecanduan smartphone	Secara total, 438 mahasiswa internasional secara sukarela berpartisipasi dalam survei tersebut. Peserta berasal dari 67 orang negara dan telah belajar di China selama berbulan-bulan	Tinggi (high)	Seluruh pertanyaan 6 – Ya 2 –Tidak	Tinggi *(High)*	JBI grade recomendasi berdasarkan FAME termasuk kategori A. Pantas untuk diaplikasikan atau diterapkan. *(unequivocal).*

Lampiran 4



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Lampiran 5

CATATAN BIMBINGAN PROPOSAL

Nama Mahasiswa : Susanti Pitri Handayani

NIM : AK.1.16.151

Judul : Hubungan smartphone addiction dengan loneliness pada remaja

Pembimbing Utama : Agus Miraj Darajat, S.Kep., Ners., M.Kes

Pembimbing Pendamping : R Siti Jundiah, S.Kp., M.Kep

No	Hari/Tanggal	Catatan Pembimbing	Paraf Pembimbing
1	Jumat, 06 Merat 2020	1. Menentukan tema Penelitian 2. Memberikan masukan mengenai variabel yang akan di teliti	Agus Miraj Darajat, S.Kep., Ners., M.Kes
2	Selasa, 10 Maret 2020	1. Melakukan studi pendahuluan	Agus Miraj Darajat, S.Kep., Ners., M.Kes

3	Rabu 19 Maret 2020	1. Konsul bimbingan Mengirimkan proposal BAB 1-3	Agus Miraj Darajat, S.Kep., Ners., M.Kes
4	Selasa, 30 April 2020	1. Koreksi tujuan umum dan khusus 2. Sumber yaqng dijadikan rujukan 3. Menyarankan litrev	Agus Miraj Darajat, S.Kep., Ners., M.Kes
5	Sabtu, 04 mei 2020	1. Mengoreksi BAB 1 2. BAB II harus jelas jurnal nasional dan internasionalnya 3. BAB III harus jelas metode nya	Agus Miraj Darajat, S.Kep., Ners., M.Kes
6	Senin 06 Mei 2020	1. Mengoreksi BAB III	Agus Miraj Darajat, S.Kep., Ners., M.Kes
7	Selasa 07 mei 2020	**ACC Sidang UP**	Agus Miraj Darajat, S.Kep., Ners., M.Kes

No	Hari / Tanggal	Catatan Pembimbing	Paraf Pembimbing
1	Sabtu 16 maret 2020	1. Mengkonsulkan BAB 1-3	R Siti Jundiah, S.Kp., M.Kep
2	Jumat, 20 maret 2020	1. Mengoreksi BAB 1 (Fenomena) 2. Mengkoreksi penulisan paragraf	R Siti Jundiah, S.Kp., M.Kep
3	Kamis, 30 April 2020	1. Mengkoreksi instrument penelitian	R Siti Jundiah, S.Kp., M.Kep
4	Kamis, 30 April 2020	1. Mengoreksi BAB I urutan nya harus focus 2. Mengoreksi BAB II harus ditambahkan bagan keranga konsep 3. Mengoreksi BAB III harus sesuai dengan buku panduan skripsi	R Siti Jundiah, S.Kp., M.Kep
5	Sabtu 16 Mei 2020	1. Mengoreksi tahapan litrev - merumuskkan masalah - telusur jurnal PICO dan keyword - evaluasi kelayakan - ekstrasi data - analisa data menggunakan prisma	R Siti Jundiah, S.Kp., M.Kep
6	19 mei 2020	**ACC Sidang Up**	R Siti Jundiah, S.Kp., M.Kep

CATATAN BIMBINGAN SKRIPSI

Nama Mahasiswa : Susanti Pitri Handayani

NIM : AK.1.16.151

Judul : Hubungan smartphone addiction dengan loneliness pada remaja

Pembimbing Utama : Agus Miraj Darajat, S.Kep., Ners., M.Kes

Pembimbing Pendamping : R Siti Jundiah, S.Kp., M.Kep

No	Hari/Tanggal	Catatan Pembimbing	Paraf Pembimbing
1	Rabu, 17 juni 2020	1. Mengirimkan revisi proposal BAB 1-3	Agus Miraj Darajat, S.Kep., Ners., M.Kes
2	Senin, 22 juni 2020	1. Melakukan bimbingan online mengenai BAB 4-5	Agus Miraj Darajat, S.Kep., Ner
3	Kamis 25 juni 2020	1. Mengkoreksi jurnal	Agus Miraj Darajat, S.Kep., Ners., M.Kes

4	Senin, 18 Agustus 2020	**ACC SIDANG AKHIR**	Agus Miraj Darajat, S.Kep., Ners., M.Kes
No	Hari / Tanggal	Catatan Pembimbing	Paraf Pembimbing
1	17 Juni 2020	Mengirimkan revisi sidang up BAB 1-3	R Siti Jundiah, S.Kp., M.Kep
2	06 Juli 2020	Melakukan bimbingan online mengenai BAB 4-5	R Siti Jundiah, S.Kp., M.Kep
3	Selasa, 17 agustus 2020	Mengkoreksi pembahasan dan penjelasan mengapa bisa demikian dari jurnal yang di telaah	R Siti Jundiah, S.Kp., M.Kep
4	Kamis 20 agustus 2020	Membahas dan mengoreksi jurnal yang akan di telaah untuk bisa sama dengan judul	R Siti Jundiah, S.Kp., M.Kep
5	Kamis 27 agustus 2020	1. Mengoreksi jurnal yang tida sesuai dengan judul 2. mengkoreksi jurnal dan harus mengubah latar belakang jika akan menggunakan jurnal tersebut	R Siti Jundiah, S.Kp., M.Kep
6	Senin 31 agustus 2020	**ACC SIDANG AKHIR**	R Siti Jundiah, S.Kp., M.Kep

Lampiran 7

BUKTI MENJADI OPONEN

Nama : Susanti Pitri Handayani

Nim : AK.1.16.151

No	Hari/Tanggal	Penyaji	Judul Proposal penelitian	Tanda Tangan Moderator	Ket
1	16 juni 2020	Mujadiddah azizah	Faktor faktor yang mempengaruhi status gizi pada remaja		Kenapa ketiga fakor itu yang diambil?

Jurnal 1

Jurnal Empati, Januari 2017, Volume 6(1), 27-33

HUBUNGAN ANTARA KESEPIAN DENGAN ADIKSI *SMARTPHONE* PADA SISWA SMA NEGERI 2 BEKASI

Angga Wirajaya Subagio, Farida Hidayati

Fakultas Psikologi, Universitas Diponegoro,
Jl. Prof. Soedarto, SH, Kampus Undip Tembalang, Semarang, Indonesia 50275

Wirajaya_angga@outlook.co.id

Abstrak

Penelitian ini bertujuan untuk mengetahui hubungan antara kesepian dengan adiksi *smartphone* pada remaja. Populasi dalam penelitian ini adalah siswa kelas X SMA Negeri 2 Bekasi. Sampel penelitian berjumlah 193 siswa. Teknik sampling yang digunakan adalah teknik *cluster random sampling*. Alat pengumpul data yang digunakan yaitu Skala Kesepian (26 aitem valid, α = 0,868) dan Skala Adiksi *Smartphone* (26 aitem valid, α = 0,859). Analisis data menggunakan analisis regresi sederhana. Hasil analisis data menunjukkan ada hubungan positif dan signifikan antara kesepian dengan adiksi *smartphone* (r = 0,189; p = 0,004). Hasil tersebut menunjukkan semakin tinggi kesepian maka semakin tinggi adiksi *smartphone*. Sumbangan efektif kesepian terhadap adiksi *smartphone* sebesar 3,6% dan sisanya sebesar 96,4% dijelaskan oleh faktor lain.

Kata kunci : adiksi *smartphone*; kesepian; remaja

Abstract

The objective of the present study was to investigate the relationship between loneliness and smartphone addiction among adolescence. The population in this study were student of class X SMA Negeri 2 Bekasi. These samples included 193 students. The sampling technique used was cluster random sampling technique. Data collection tool used are Loneliness Scale (26 item valid, α = 0,868) and Smartphone Addiction Scale (26 aitem valid, α = 0,859). Analysis of data used was simple regression analysis. The result showed there was a positive and significant correlation between loneliness and smartphone addiction (r = 0,189; p = 0,004). This result suggest the higher loneliness, the higher the smartphone addiction. Loneliness provides effective contribution to the smartphone addiction by 3,6% and the remaining 96,4% are explained by other factors.

Keyword: smartphone addiction; loneliness; adolescence

PENDAHULUAN

Penciptaan dan perkembangan *smartphone* telah mengubah kehidupan manusia. *Smartphone* secara radikal mengubah kehidupan sehari-hari bahkan mengubah budaya dan nilai-nilai yang ada. Pengguna *smartphone* pada tahun 2013 mencapai 1,9 miliar, merepresentasikan 27% populasi dunia, dan diprediksi jumlah pengguna *smartphone* akan terus meningkat sampai 5,6 miliar pada tahun 2019 (Ericsson Mobility Report, 2013). Pengguna *smartphone* usia 18 sampai 24 tahun secara menghabiskan waktu lebih banyak dibandingkan usia lainnya, dengan penggunaan rata-rata selama 5,2 jam perhari (Salesforce, 2014). Di Indonesia, meskipun pengguna akses internet menjadi salah satu yang terendah di dunia dengan 30% dari seluruh populasi masyarakat Indonesia, namun kepemilikian *smartphone* terus meningkat selama dua tahun menjadi 21% dari seluruh populasi yang berarti pengguna internet di Indonesia

menggunakan *smartphone* untuk mengakses internet dengan 89% digunakan untuk mengakses media sosial (Poushter, 2016).

Secara khusus, *smartphone* membuat orang untuk terlibat dalam aktivitas yang beragam seperti mengirim *email*, belanja secara *online*, dan jejaring sosial yang dapat meningkatkan produktivitas bekerja dan perputaran ekonomi (Shiraishi, Ishikawa, Sano, & Sakurai, 2011). Sifat dari *smartphone* yang portabel dan fleksibel untuk menggunakan aplikasi dan koneksi internet secara konstan, penggunaan *smartphone* menjadi semakin terikat dengan kehidupan sehari-hari manusia dibandingkan dengan teknologi lain. *Smartphone* membuat dunia maya menjadi bagian yang penting dalam interaksi sosial sehari-hari, mudah diakses secara nirkabel, dan menjadikan hubungan *online* dapat dilakukan selama 24 jam (Woyke, 2014).

Pemberdayaan *smartphone* dapat membuka lapangan pekerjaan baru, mengurangi biaya promosi bisnis, dan meningkatkan infrastruktur teknologi di negara berkembang (Mazumder, 2010). Pemerintah menggunakan jaringan *mobile* untuk dapat melakukan komunikasi dengan masyarakat, membangun infrastuktur kota berbasis jaringan internet, melakukan kontrol kesehatan menggunakan aplikasi oleh praktisi medis, dan membantu wiraswasta untuk meningkatkan produktifitas dan pendapatan. *Smartphone* dapat membantu pelajar untuk mengakses materi pelajaran dari internet, meningkatkan prestasi, dan membangun komunikasi antara pelajar dengan guru (Sarwar & Soomro, 2013). Banyaknya manfaat yang didapatkan dari *smartphone*, namun penggunaan secara berlebihan dapat memberikan dampak negatif. Penggunaan *smartphone* dapat mengubah pola hidup yang telah terbentuk sebelumnya. White, Buboltz, dan Igou (2010) menemukan bahwa penggunaan *smartphone* sebelum tidur memiliki hubungan dengan rendahnya kualitas tidur. Individu yang terbiasa menggunakan *smartphone* menjadi sulit untuk mengabaikan *smartphone* sehingga mengalami kesulitan tidur.

Smartphone dapat mempengaruhi remaja dalam kehidupan sehari-hari dan akademik. Hasil penelitian Chen (2006) membuktikan bahwa penggunaan *smartphone* pada pelajar menyebabkan kesulitan untuk memperhatikan dan mengerjakan tugas ketika berada di dalam kelas karena cenderung tidak dapat memisahkan fungsi *smartphone* sebagai alat bermain atau belajar. Temuan tersebut selaras dengan penelitian McCoy (2013) menunjukkan pelajar yang melakukan *multitask* dengan peralatan digital (*smartphone*, laptop, tablet) di dalam ruang kelas, menunjukkan adanya hambatan dalam memperhatikan pelajaran. Gentile dkk. (2012) menyatakan bermain *video games* dapat merusak konsentrasi jangka panjang pada anak. Hal tersebut terjadi karena *video games* atau media lain memiliki layar dengan getaran cahaya dan efek suara yang dapat menarik individu untuk memperhatikan sehingga tidak perlu bekerja keras melakukan konsentrasi seperti ketika berada di kelas. Penelitian lain pada remaja yang dilakukan Rowland, dkk. (2008) menemukan remaja yang terbiasa menggunakan *search engine* tidak memiliki kemampuan berpikir kritis dan analitis untuk menilai informasi yang ditemukan pada *web*. Kondisi tersebut terjadi karena tidak berusaha untuk memikirkan jawaban dari suatu masalah, namun menggunakan *search engine* untuk mendapat jawaban. Jeong dan Lee (2015) menunjukkan adiksi *smartphone* memiliki korelasi negatif dengan prestasi akademik, kuantitas membaca, dan keterlibatan bersama kelompok

Penyebab munculnya adiksi menurut Young (2015), salah satunya adalah masalah sosial berupa masalah intrapersonal seperti harga diri rendah atau kemampuan komunikasi yang rendah, dan masalah interpersonal seperti kesepian. Kesepian merupakan perasaan tidak menyenangkan yang menghilangkan hubungan sosial, yang dapat menyebabkan seseorang menyalahgunakan zat, distres, kehilangan konsentrasi, hingga kematian (Greenberg, Schmader, Arndt, & Landau,

2015). Kelompok remaja dan dewasa awal merupakan kelompok yang paling kesepian dibandingkan dengan kelompok dari usia lainnya (Kasin & Steven Fein, 2014).
Penelitian Chib dkk. (2013) di Singapura terhadap pekerja migran, menunjukkan bahwa pekerja migran perempuan menggunakan *smartphone* untuk mendapatkan dukungan sosial dan mengurangi stres. Upaya untuk mendapatkan dukungan sosial, membuat pekerja migran menggunakan *smartphone* dengan intensitas tinggi. Berdasarkan uraian yang dikemukakan dalam latar belakang, *smartphone* merupakan teknologi penting yang telah mengubah gaya hidup. Meskipun dengan berbagai manfaat, *smartphone* memiliki dampak negatif seperti adiksi. Adiksi *smartphone* dapat terjadi karena individu menggunakan *smartphone* sebagai *coping* dari masalah yang dihadapi, salah satunya yaitu kesepian.

METODE

Populasi dalam penelitian ini adalah siswa kelas X SMA Negeri 2 Bekasi dengan karakteristik subjek penelitian yaitu berusia 15 sampai 18 tahun, memiliki *smartphone*, dan menggunakan *smartphone* lebih dari 5,5 jam per hari. Teknik pengambilan sampel yang digunakan dalam penelitian ini yaitu teknik *cluster random sampling*. Sampel penelitian yang diperoleh sebanyak 193 siswa. Pengumpulan data dilakukan dengan menggunakan dua skala yaitu Skala Adiksi *Smartphone* berjumlah 26 aitem ($\alpha = 0,859$) yang disusun menggunakan dimensi adiksi internet menurut Griffiths (dalam Young, 2011) dan Skala Kesepian berjumlah 26 aitem ($\alpha = 0,868$) yang disusun berdasarkan dimensi kesepian menurut Gierveld (dalam Dayakisni & Hudaniah, 2015).
Teknik analisis data yang digunakan dalam penelitian ini adalah analisis regresi sederhana. Proses analisa data dalam penelitian ini menggunakan *Statistical Package for Social Science (SPSS)* versi 21.

HASIL DAN PEMBAHASAN

Tabel 1.
Uji Normalitas

Variabel	*Kolmogorov-Smirnov*	p > 0,05	Bentuk
Adiksi *Smartphone*	1,044	0,255	Normal
Kesepian	0,68	0,744	Normal

Berdasarkan hasil uji normalitas diperoleh nilai *Kolmogorov-Smirnov* variabel adiksi *smartphone* sebesar 1,044 dengan $p = 0,255$ ($p > 0,05$) dan variabel kesepian sebesar 0,68 dengan $p = 0,744$ ($p > 0,05$). Hasil tersebut menunjukkan distribusi data tersebut normal.

Tabel 2.
Uji Linearitas

Hubungan Variabel	Nilai F	Signifikansi p<0,05	Keterangan
Kesepian dengan Adiksi *Smartphone*	7,111	0,008	Linear

Berdasarkan hasil uji linearitas menunjukkan bahwa hubungan antara variabel kesepian dengan adiksi *smartphone* menghasilkan nilai koefisien $F = 7,111$ dengan nilai signifikansi sebesar $p = 0,008$. Hasil tersebut menunjukkan bahwa kedua variabel penelitian memiliki hubungan yang linear.

Tabel 3.
Uji Hipotesis 1

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
1. Constant	51,221	4,068		12,591	.000
Kesepian	0,194	0,073	0,189	2,667	.008

Hasil analisis regresi sederhana menunjukkan besarnya koefisien korelasi antara kesepian dengan adiksi *smartphone* sebesar 0,189 dengan signifikansi 0,004 ($p < 0,001$). Hasil tersebut menunjukkan bahwa arah hubungan antara kesepian dengan adiksi *smartphone* adalah positif dan signifikan. Berdasarkan paparan di atas, dapat disimpulkan bahwa hipotesis yang diajukan dalam penelitian, yaitu ada hubungan positif antara kesepian dengan adiksi *smartphone* dapat diterima. Persamaan garis linear berdasarkan tabel yaitu $Y = 51,221 + 0,194X$. Hal ini berarti variabel adiksi *smartphone* (Y) akan berubah sebesar 0,194 untuk setiap unit perubahan yang terjadi pada variabel kesepian.

Tabel 4.
Uji Hipotesis 2

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0,189	0,036	0,031	8,587

Hasil koefisien determinan (*R Square*) menunjukkan 0,036. Hal ini berarti sumbangan efektif kesepian dengan adiksi *smartphone* sebesar 3,6%. Jadi, adiksi *smartphone* 16% dipengaruhi oleh kesepian, sedangkan 96,4% dipengaruhi faktor lain yang tidak diungkap di dalam penelitian ini, seperti gender, tujuan penggunaan, waktu, finansial, dan psikologis. Hasil penelitian ini mendukung pernyataan Young (2015), adiksi terjadi karena ada kebutuhan untuk menghindari perasaan yang tidak menyenangkan. Sullivan (dalam Santrock, 2014) mengatakan, ketika masa remaja kebutuhan akan kedekatan hubungan sosial menguat, kegagalan dalam membangun hubungan sosial dapat berujung *kesepian* dan berkurangnya rasa harga diri. Sejalan dengan penelitian Al-Khatib (2012), menunjukkan rendahnya *self-esteem* dan *self-efficacy* pada pelajar memiliki hubungan dengan tingginya kesepian, pelajar yang memiliki *self-efficacy* dan *self-esteem* rendah cenderung merasa kurang diterima oleh orang lain sehingga merasa kurang percaya diri untuk memulai suatu hubungan. Mengurangi perasaan tidak menyenangkan dengan melakukan suatu aktivitas dapat menjadi *negative reinforcement* yang berujung pada adiksi (Barlow & Durand, 2012). Sesuai dengan penelitian Esen dan Gundogdu (2010) pada remaja menunjukan, tingginya tingkat *peer pressure* dan rendahnya dukungan dari orang tua atau guru memiliki hubungan positif dengan adiksi, karena adanya tekanan dari teman dan konflik keluarga maka remaja menggunakan *smartphone* untuk menghindari masalah dalam hidup.

KESIMPULAN

Berdasarkan hasil penelitian yang telah dilakukan dapat disimpulkan bahwa terdapat hubungan yang positif dan signifikan antara kesepian dengan adiksi *smartphone* pada siswa kelas X SMA Negeri 2 Bekasi $r_{xy} = 0{,}189$; $p = 0{,}008$. Semakin tinggi kesepian maka semakin tinggi adiksi *smartphone* yang dialami oleh siswa SMA Negeri 2 Bekasi.

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Linking Loneliness, Shyness, Smartphone Addiction Symptoms, and Patterns of Smartphone Use to Social Capital

Mengwei Bian[1] and Louis Leung[1]

Abstract

The purpose of this study is to explore the roles of psychological attributes (such as shyness and loneliness) and smartphone usage patterns in predicting smartphone addiction symptoms and social capital. Data were gathered from a sample of 414 university students using online survey in Mainland China. Results from exploratory factor analysis identified five smartphone addiction symptoms: disregard of harmful consequences, preoccupation, inability to control craving, productivity loss, and feeling anxious and lost, which formed the Smartphone Addiction Scale. Results show that the higher one scored in loneliness and shyness, the higher the likelihood one would be addicted to smartphone. Furthermore, this study shows the most powerful predictor inversely affecting both bonding and bridging social capital was loneliness. Moreover, this study presents clear evidence that the use of smartphones for different purposes (especially for information seeking, sociability, and utility) and the exhibition of different addiction symptoms (such as preoccupation and feeling anxious and lost) significantly impacted social capital building. The significant links between smartphone addiction and smartphone usage, loneliness, and shyness have clear implications for treatment and intervention for parents, educators, and policy makers. Suggestions for future research are discussed.

Keywords

loneliness, Mainland China, shyness, social capital, smartphone addiction

Introduction

The increase in the demand for mobile, mediated interpersonal, and mass communication technologies boosted the powerful evolution of mobile phone devices during the last decade. Smartphones, distinct from standard mobile phone in operating system and equipped with more advanced 3G or 4G features and capabilities (e.g., socializing on Facebook and viewing/posting video on YouTube),

[1] The Chinese University of Hong Kong, Hong Kong, China

Corresponding Author:
Louis Leung, The Chinese University of Hong Kong, Shatin, N.T., Hong Kong, China.
Email: louisleung@cuhk.edu.hk

are rapidly gaining popularity worldwide. In 2012, the number of smartphones sold in the world market reached 700 million and accounted for 40% of the total sales of all mobile phones, an increase of 43% over a year ago (Rivera, 2013; Strategy Analytics, 2013). In urban China, the smartphone penetration rate skyrocketed to 66% last year, exceeding developed economies such as the United States and the United Kingdom (Gao, 2013). According to a report released from Analysys International, the penetration rate of smartphones in China, among those aged 21 to 30 years old, was 68.4%, which is the largest in the smartphone market (Xinhua Net, 2011).

Although the widespread adoption and use of smartphones presents attractive statistics for the industry, for social scientists, it also provides a new area for research into some social problems, especially in the overuse of the device. Past research has focused on mobile phone addiction and its impact on face-to-face communication (Leung, 2008). People are now less attentive to whom they are with in person and indulge themselves in their smartphones, not only for connecting with other people but also for features and functions like reading e-books, answering e-mails, texting short messages, or engaging in online games. Some users even put the mobile phone on the table for all to see, implying that if the interaction is not interesting enough, they have alternatives. Furthermore, the culture of using mobile phones in inappropriate places with little respect for others has made some users appear invasive, impolite, and disruptive (Rosen, 2004; Wei & Leung, 1999).

Although previous studies have paid much attention to mobile phone addiction and Internet addiction (Leung, 2008; Young, 1998), little research has specifically explored smartphone addiction. Thus, the purpose of this study is to investigate the degree to which smartphone addiction exists among university students in Mainland China (henceforth "Chinese students" in the remainder of this study to represent "university students in mainland China") and develop and test Smartphone Addiction Scale (SPAS) to better measure smartphone addiction. Besides, past research was aware of the importance of social capital in technology development (Fountain, 1997; Riemer, 2004; Syrjanen & Kuutti, 2004), but few focused on the impact of mobile technologies on social capital. In addition, past research has demonstrated that psychological attributes such as loneliness and shyness have a significant effect on people's addiction to different substances (Brook & Newcomb, 1995; Dobkin, Tremblay, Masse, & Vitaro, 1995; Engelberg & Sjoberg, 2004; Ensminger, Juon, & Fothergill, 2002; Gaev, 1976; Weiss, 1973). Following this line of research, this study also examines whether loneliness and shyness can explain symptoms of smartphone addiction and investigates the roles of the smartphone usage patterns and smartphone addiction on social capital.

Literature Review

Smartphone addiction. Addictive mobile phone use can be regarded as an impulse control disorder that does not involve an intoxicant and is similar to pathological gambling (Park & Lee, 2011). Previous mobile phone addiction research was mostly based on past investigation of Internet addiction (Beard, 2002; Beard & Wolf, 2001; Chak & Leung, 2004; Leung, 2004; Scherer, 1997; Young, 1998), which assumed that behavioral addiction, especially people who are addicted to Internet, is similar to people who are addicted to gambling, drugs, and alcohol (Young, 1996). Researchers in mobile phone addiction in Nordic countries also found positive relationships between mobile phone use and health-compromising behaviors (Leenaa, Tomib, & Arjab, 2005). In particular, Thomée, Härenstam, and Hagberg (2011) found that high mobile phone use was associated with sleep disturbances and symptoms of depression in Sweden.

To clinically define addictive use of the smartphone, it is necessary to compare it against criteria for other established addictions. The American Psychiatric Association's *Diagnostic and Statistical Manual of Mental Disorders* (known as *DSM*) has established objective and measurable criteria for assessing "substance dependence" (American Psychiatric Association, 1994). The main diagnostic criterion is a maladaptive pattern of substance use, leading to significant psychological impairment.

This impairment is manifested by symptoms. Bianchi and Phillips (2005) developed the Mobile Phone Problem Use Scale (MPPUS), which identified several symptoms mobile phone addicts exhibit. They found that addicts of mobile phones hide their actual use from family and friends; face financial crises[1] because of excessive use of mobile phones; feel preoccupied, anxious, or depressed when out of reception range for some time; continuously fail to control or cut back mobile phone use; and use mobile phones to escape from problems and emergencies.

Past research has investigated mobile phone addiction from the perspectives of leisure, boredom, sensation seeking, and self-esteem (Leung, 2008). This study explores predictors from other psychological perspectives such as loneliness and shyness, in order to differentiate addicts from nonaddicts of smartphones among Chinese students. More importantly, this study seeks to explain the effects of smartphone usage and smartphone addiction specifically on social capital. Before reviewing the psychological literature, this study asks two research questions:

Research Question 1: What smartphone addiction symptoms can be identified among a group of Chinese students?

Research Question 2: To what extent are Chinese students addicted to smartphone use?

Loneliness. Loneliness is defined as perceived deficiencies in one's ongoing relationships in both number and quality (Peplau, Russell, & Heim, 1979). Such deficiencies occur when "a person's network of relationships is either smaller or less satisfying than the person desires" (Peplau et al., 1979, p. 55). Past studies have found a significant relationship between loneliness and deficits in social interaction, especially when talking to others (Jones, 1982; Spitzberg & Canary, 1985). Lonely people tend to talk less, have lower levels of involvement and attention, and inappropriate levels of self-disclosure (Sloan & Solano, 1984; Solano, Batten, & Parish, 1982). In addition, lonely people are more likely to be relationally incompetent, and as a result, they spend less time on social activities but more time being alone (Spitzberg & Canary, 1985). According to Woodward and Frank (1988), adolescence is usually labeled as a time of loneliness, distress, alienation, and solitude. Research also concluded that loneliness is related to deviant drug and alcohol use, overeating, and even suicide (Gaev, 1976; Weiss, 1973; Wenz, 1977). Loneliness has also been found to be significantly associated with Internet addiction. Engelberg and Sjoberg (2004) found that lonely people with poorer social skills tend to have more frequent use of the Internet.

When it comes to mobile communication, the basic purpose of the mobile phone is to allow people in two different places to communicate instantly, eliminating the primary human anxiety about loneliness (Townsend, 2000). Thus, it is reasonable to believe that lonely people might tend to use a mobile phone more to get rid of this kind of anxiety. In Korea, Park (2005) also found that loneliness is positively correlated with mobile phone addiction among college students. In line with these, this study expects lonely people would be more likely to be addicted to smartphones and would have heavier use of smartphones. Since lonely people are reluctant to talk to others in face-to-face communication, they would tend to interact with people by texting or other social networking applications on smartphones.

Shyness. Shyness is understood as a lack of confidence in meeting people and feeling uncomfortable in the presence of others. The key to shyness is anxiety over being assessed by others (Pilkonis, 1977). Cheek and Buss (1981) defined shyness as "one's reaction to being with strangers or casual acquaintances including tension, concern, feelings of awkwardness and discomfort, and both gaze aversion and inhibition of normally expected social behavior" (p. 330).

Shy people tend to regard their networks as less supportive and less satisfying and are happy and more comfortable being by themselves (Parrott, 2000). Shyness is associated with problematic drug

and alcohol use both in adolescence and in adulthood (Brook & Newcomb, 1995; Dobkin et al., 1995; Ensminger et al., 2002; Hawkins, Catalano, & Miller, 1992; Kellam, Simon, & Ensminger, 1983). Research has also shown that the computer-mediated medium provides shy people a perfect environment to perceive control over the communication process (Carducci & Zimbardo, 1995). Past research has found that deviant Internet use is significantly correlated to shyness (Caplan, 2002; Ofosu, 1999). However, Wei and Lo (2006) found that shyness was negatively associated with motivation to use mobile phones and with the amount of mobile phone use.

Smartphone use, on the other hand, provides a similar environment to what the Internet provides. This is because smartphones not only have functions and features like verbal communication but also have other applications such as texting (e.g., WhatsApp, WeChat), which provide functions for social networking. These functions let people avoid communicating with others face-to-face or even by voice; thus, this may be a preferred way for shy people to communicate with others. In addition, other functions of smartphones, which give people access to entertainment like games or allow people to get information by surfing on the Internet, help shy people to escape from uncomfortable situations while in public and indulge in a virtual, private mobile computing environment. As a result, it seems that shy people would rely more on smartphones, which may lead to heavier smartphone use. Thus, the study proposes the following research question:

Research Question 3: How can smartphone addiction symptoms be predicted by demographics, loneliness, shyness, and smartphone usage?

Social capital. Bourdieu and Wacquant (1992) defined social capital as "the sum of the resources, actual or virtual, that accrue to an individual or a group by virtue of possessing a durable network of more or less institutionalized relationships of mutual acquaintance and recognition" (p. 14). Putnam (2000) conceptualized social capital as bridging and bonding social capital and distinguished between the two with the former being what network researchers refer to as *weak ties* and the latter as *social capital* found between individuals in tightly knit, emotionally close relationships, such as family and close friends.

Meanwhile, the relationship between social capital and information and communication technologies (ICTs) seems to be not quite clear in the research literature. High levels of social capital were shown to be a success factor for establishing electronic-based social networks (Fukuyama, 2001), while ICTs with sophisticated networking infrastructure encourage the formation of social capital (Calabrese & Borchert, 1996). Thus, the relationship between social capital and ICTs seems to be mutual. Since social capital is about connections among people, people who are addicted to smartphones or use a smartphone heavily may also generate more social capital. Conversely, less social capital may result since the smartphone occupies the time that could be used to bridge or bond with others. Therefore, we propose the following research question:

Research Question 4: To what extent can demographics, loneliness, shyness, smartphone usage, and smartphone addiction symptoms predict (a) bonding social capital and (b) bridging social capital?

Method

Setting and Sampling

As an exploratory study, this research targets Chinese students, as they are the most likely subjects in China to be early adopters of smartphones. First, to guide the questionnaire design, an online focus group was conducted among a group of 20 university students in order to assess their motivations and usage patterns of smartphones. Questionnaire was initially designed in Chinese and later

translated into English.[2] The results showed that two most common social media apps were Weibo and WeChat; they played various games: adventure, card, puzzle, racing, strategy, and so on; and the most common e-commence app was Taobao. Data were later collected by an online Chinese questionnaire on sojump.com, one of the most professional website for online survey in China, which allows users to post their own survey for free which is especially popular among university students (sojump.com also provide paid survey service), with a snowball sampling of 565 Chinese students from March 13–28, 2012. Among the 565 completed questionnaires, only 478 were smartphone users. In addition, 64 were excluded as repeated submissions or questionable questionnaires. Thus, the total valid sample size was 414.

The sample consisted of 61.6% females and 38.4% males. Nearly 2% of the respondents were aged under 18, 35.5% were aged from 19 to 22, 60.1% were aged from 23 to 26, and 2.4% of respondents were aged from 27 to 30. As for education, of the 414 respondents, 4.1% were in Year 1; 7.2% were in Year 2; 5.8% were in Year 3; 37.4% were in Year 4; 44% were master's students; and 1.4% were PhD students. In terms of household monthly income, 15% of respondents reported less than Renminbi (RMB) 3,000; 31.2% were in the range of RMB 3,001–6,000; 29.5% were RMB 6,001–10,000; 14.3% were RMB 10,001–20,000; and 10.1% reported more than RMB 20,000. Current U.S. dollar exchange rate with RMB is US$1 = RMB 6.16522 at the time of the study.

Measurement

Mobile phone addiction. The MPPUS developed by Bianchi and Phillips (2005), the Internet Addiction Test (Young, 1998), and the Television Addiction Scale (Horvath, 2004) were adapted to measure smartphone addiction in this study. All measures were based on *DSM* (Fourth edition; DSM-IV) criteria, which are in line with the assumption that behavioral addiction shows symptoms that are similar to addiction to other substances (e.g., alcohol). Young's Internet Addiction Scale was used in the study, as smartphone today provides an environment to let people access Internet anytime anyplace which may lead to symptoms caused by Internet addiction. This study also adopted items from Horvath's Television Addiction Scales (2004), as it was prudent to include additional *DSM-IV* criteria that were not included in Young's scale since smartphone can also be used as a remote TV. However, only 19 items from the three scales mentioned earlier were adopted. Using Young's (1996) classic definition of assessing Internet addiction with 8 revised items similar to those used in *DSM-IV* for screening gambling problems, 8 items embedded in the original 19 items were used to create the composite smartphone addiction index (SPAI). Sample items included "You have tried to hide from others how much time you spend on your smartphone" and "You find yourself engaged on the smartphone for longer periods of time than intended." These 8 items were also used by Young (1996) to develop her screening instrument for addictive Internet use and by Leung (2008) for addictive mobile phone use. A 5-point Likert-type scale was used for the 19-item SPAI scale with 1 = *not true at all* to 5 = *extremely true*. The Cronbach's α was high at .92.

Loneliness. To assess loneliness, a short form of the Revised UCLA Loneliness Scale, version 3, was adopted (Russell, 1996). Respondents were asked to express how they feel about eight statements (e.g., "You can find companionship when you want it" and "People are around you but not with you") using a 4-point Likert-type scale, ranging from 1 = *never* to 4 = *always*. The Cronbach's α was .71.

Shyness. A short version of Cheek and Buss's (1981) Shyness Scale was used to evaluate shyness. Respondents were asked to rank their agreement with six statements (e.g., "You are socially somewhat awkward" and "You don't find it hard to talk to strangers") using a 5-point Likert-type scale, from 1 = *strongly disagree* to 5 = *strongly agree*. The Cronbach's α was .73.

Table 1. Factor Analysis of Smartphone Usage (Smartphone Users Only).

How Often Do You Use the Smartphone for . . .?	Factors				Mean	SD
	1	2	3	4		
Information seeking						
1. Surfing on the Internet	.85				3.77	.98
2. Using search engine	.68				3.59	1.05
3. Checking information about daily life	.64				3.33	1.05
4. Viewing news	.63				3.26	1.14
5. Using instant message	.62				3.84	1.01
6. Using social networking services	.48	.45			3.85	1.02
Utility						
7. Functions related to efficiency		.72			3.06	1.05
8. Dictionary		.71			3.23	1.06
9. E-mail		.64			2.66	1.22
10.Taking photos and videos		.61			3.53	.86
Fun seeking						
11. Watching videos			.78		2.54	1.07
12. Listening to music			.75		3.29	1.15
13. E-book			.64		2.82	1.19
14. Game			.60		2.98	1.09
Sociability						
15. Making phone call				.84	4.15	.78
16. Texting				.83	3.96	.92
Eigenvalue	2.80	2.30	2.16	1.55		
Variance explained (%)	17.52	14.40	13.47	9.70		
Cronbach's α	.79	.68	.68	.64		

Note. $N = 414$. *SD* = standard deviation. Scale used: 1 = *almost never*, 2 = *seldom*, 3 = *sometimes*, 4 = *often*, and 5 = *very often*.

Smartphone usage. To assess the pattern of smartphone usage, respondents were asked how often they used 16 different functions of the smartphones such as texting, calling, and gaming, using a 5-point Likert-type scale ranging from 1 = *almost never* to 5 = *very often*. As shown in Table 1, a principal components factor analysis with Varimax rotation identified four major functions with Eigenvalues greater than 1, explaining 55.09% of the variance including information seeking (6 items; $\alpha = .79$), utility (4 items; $\alpha = .68$), fun seeking (4 items; $\alpha = .68$), and sociability (2 items; $\alpha = .64$).

Social capital. To measure social capital, a short version of bridging and bonding social capital measures constructed by Williams (2006) was employed. Respondents were asked to rank their agreement with four statements for bonding and four statements for bridging social capital (e.g., "There is someone online/offline you can turn to for advice about making very important decisions" and "There are several people online/offline you trust to solve your problems") using a 5-point Likert-type scale with 1 = *strongly disagree* to 5 = *strongly agree*. The Cronbach's α for bonding social capital was .72 and for bridging social capital was .70. Descriptive results and the bivariate relationships for all main variables are presented in Tables 2 and 3.

Findings

Smartphone addiction symptoms. The 19-item SPAS was developed to collect responses from 414 Chinese students to identify smartphone addiction symptoms and to assess their overall level of smartphone addiction. The mean score for the 19-item SPAS was 48.48 and standard deviation equaled 12.75 (with possible scores ranged from 0 to 95; see Table 2). As shown in Table 4, principal

Table 2. Descriptive Results on Main Measures.

	Loneliness	Shyness	SPAS	Bonding Social Capital	Bridging Social Capital
Mean score	2.14	2.33	48.48	3.00	2.82
SD	0.43	0.45	12.74	0.51	0.46
Min	1.00	1.00	19.00	1.50	1.50
Max	3.25	3.67	89.00	4.00	4.00

Note. Max = maximum; Min = minimum; *SD* = standard deviation.

components factor analysis (with Varimax rotation, Eigenvalue greater than 1, and factor loading greater than .50) yielded a five-factor smartphone addiction symptoms structure and accounted for 70.09% of the total variance. The first factor was "disregard of harmful consequences" (5 items; $\alpha = .88$), indicating that Chinese students suffered from being late for appointments, school, or work as a result of too much time spent on smartphones and got in trouble because their smartphone went off during a meeting, lecture, or in a theater. "Preoccupation" ($\alpha = .82$) was the second factor. It included 5 items characterizing that Chinese students feel preoccupied with smartphones when they were not using it or fantasized about using it, found themselves engaged on smartphones for longer periods of time than intended, and anticipated using their smartphone again. "Inability to control craving" ($\alpha = .82$) was the third factor. It contained 4 items illustrating the inabilities of Chinese students to avoid complaints they received from friends and family about their obsessive smartphone use, to stop using a smartphone, and to cut down on the amount of smartphone use. "Productivity loss" ($\alpha = .86$) was the fourth factor. It consisted of 3 items indicating that Chinese students found that excessive use of the smartphone has caused problems in their lives, decreased productivity, occupied time for other things, and diverted attention from pressing issues that they should be facing. The fifth factor, "feeling anxious and lost" ($\alpha = .79$), contained 2 items reflecting that Chinese students felt anxious or preoccupied when out of reception range for some time.

As a whole, this study identified five smartphone addiction symptoms, which were conceptually consistent with the diagnostic criteria of pathological gambling described in *DSM-IV*. The original *DSM* measurement for pathological gambling was based on 8 items; however, this study employed 19.

Extent of smartphone addiction. To assess the extent to which university students were addicted to smartphones, the 8 items from the original 19 that are most conceptually equivalent to Young's (1996) screening instrument in Internet addiction were employed. First, the 5-point Likert-type scale for these 8 items was dichotomized with "1" to "3" recoded to "0" and "4" and "5" recoded to "1." These 8 items were summed, which yielded a value ranging from "0" to "8." Students with a score of 5 or above were classified as addicts. According to this classic measurement, 13.5% in the sample were addicted to smartphones. However, we recognize that such magnitude is small and addictions are developed from regular habit-formation processes over time and some users develop them into addictions (i.e., meeting the criteria similar to *DSM-IV* in assessing substance addiction) and some don't (Oulasvirta, Rattenbury, Ma, & Raita, 2012).

Predicting smartphone addiction. Regression results in Table 5 show loneliness ($\beta = .22, p \leq .001$) was one of the strongest predictors in influencing smartphone addiction (as shown in SPAI) followed by shyness ($\beta = .21, p \leq .001$). This means that Chinese students who are most vulnerable or easily become addicted to smartphones are generally those who scored high in loneliness and shyness. In examining the predictive power of the two psychological variables on the five dimensions of smartphone addiction symptoms, data show that shyness was more influential than loneliness. Specifically, shyness was a predictor of preoccupation ($\beta = .14, p \leq .01$), inability to control craving

Table 3. Zero-Order Pearson Correlation Matrix for Observed Variables.

	2	3	4	5	6	7	8	9	10	11	12	13	14
Psychological attributes													
1. Loneliness	.40***	−.09	−.02	.08	−.22***	.31***	.31***	.09	.05	.18***	.04	−.37***	−.27***
2. Shyness		.05	.02	.01	−.06	.30***	.11*	.15**	.14**	.18***	.12*	−.17***	−.21***
Smartphone usage													
3. For information seeking			—	—	—	.13**	−.11*	.11*	.17***	.06	.11*	.23***	.20***
4. For utility				—	—	.11*	−.06	.15**	.11*	−.02	.08	.13**	.16***
5. For fun seeking					—	.20***	.24***	.14**	.12*	.003	−.13**	−.10*	−.06
6. For sociability						−.11*	−.13**	.05	−.09	−.10*	.06	.24***	.12*
Smartphone addiction													
7. Smartphone addiction index (SPAI)							.52***	.46***	.49***	.44***	.31***	−.06	−.03
8. Disregard of harmful consequences								—	—	—	—	−.28***	−.15**
9. Preoccupation									—	—	—	.20***	.19***
10. Inability to control craving										—	—	−.05	−.04
11. Productivity loss											—	−.10*	−.12*
12. Feeling anxious and lost												.17***	.12*
Social capital													
13. Bonding													.52***
14. Bridging													

Note. $N = 414$.
*$p \leq .05$; **$p \leq .01$; ***$p \leq .001$.

Table 4. Factor Analysis of Smartphone Addiction.

How true do the following statements describe you?	Factors					*M*	*SD*
	1	2	3	4	5		
Disregard of harmful consequences							
1. You are often late for appointments because you are engaged on the smartphone when you shouldn't be. (mobile)	.87					1.92	.95
2. Your grades or schoolwork suffer because of the amount of time you spend on smartphone. (Internet)	.80					2.04	.90
3. More than once you have been in trouble because your smartphone has gone off during a meeting, lecture, or in a theatre. (mobile)	.75					2.15	.98
4. You have tried to hide from others how much time you spend on your smartphone. (mobile) (7)*	.66					2.13	.98
5. You have attempted to spend less time on your smartphone but are unable to. (mobile) (3)*	.61					2.26	1.01
Preoccupation							
6. You find yourself anticipating when you will use smartphone again. (Internet)		.83				2.91	1.02
7. You feel preoccupied with smartphone when you are not use it, or fantasize about using it. (Internet)		.76				2.46	1.06
8. When you are unable to use smartphone, you miss it so much that you could call it "withdrawal". (TV)		.69				3.10	1.06
9. You have used your smartphone to make yourself feel better when you were feeling down. (mobile) (8)*		.55	.47			3.00	1.00
10. You find yourself engaged on the smartphone for longer periods of time than intended. (mobile) (5)*		.52	.44			3.25	1.08
Inability to control craving							
11. You have been told that you spend too much time on your smartphone. (mobile)			.73			2.43	1.12
12. You can never spend enough time on your smartphone. (mobile) (2)*			.70			2.61	1.15
13. You often think that you should cut down on the amount of smartphone that you use. (TV)			.61			2.91	1.00
14. Your friends and family complain about your use of the smartphone. (mobile)			.56			2.54	1.07
Productivity loss							
15. Your productivity has decreased as a direct result of the time you spend on the smartphone. (mobile)				.83		2.42	1.05
16. You find yourself occupied on your smartphone when you should be doing other things, and it causes a problem. (mobile) (6)*				.82		2.32	0.97
17. There are times when you would rather use the smartphone than deal with other more pressing issues. (mobile)				.65		2.41	1.09
Feeling anxious and lost							
18. When out of range for some time, you become preoccupied with the thought of missing a call. (mobile) (1)*					.86	2.82	1.09
19. You feel anxious if you have not checked for messages or switched on your smartphone for some time. (mobile) (4)*					.86	2.81	1.10
Eigenvalue	3.65	2.74	2.65	2.53	1.76		
Variance explained (%)	19.19	14.39	13.96	13.31	9.24		
Cronbach's α	.88	.82	.82	.86	.79		

Note. $N = 414$. *SD* = standard deviation; TV = television. Scale used: 1 = *not true at all*; 2 = *not true*; 3 = *ordinary*; 4 = *true*; 5 = *extremely true*. *Items resemble or are equivalent to the 8-item Young's Internet addiction diagnostic scale.

Table 5. Hierarchical Regression Analysis of Smartphone Addiction Using Demographics, Shyness, Loneliness, and Smartphone Usage as Predictors.

	Smartphone Addiction Index (SPAI)[a]		Smartphone Addiction Symptoms									
			Disregard of Harmful Consequences		Preoccupation		Inability to Control Craving		Productivity Loss		Feeling Anxious and Lost	
Predictors	β	ΔR^2	β	ΔR^2	β	ΔR^2	β	ΔR^2	β	ΔR^2	β	ΔR^2
Demographics												
Age	.06		−.07		.03		.02		−.04		−.02	
Gender (male = 1)	−.01		.21***		−.13**		−.12*		.06		−.01	
Grade	−.13**		−.17***		−.01		−.10*		−.06		.15**	
Family Monthly Income	−.03	.01	−.09	.07	−.05	.01	−.02	.02	−.02	.00	.07	.02
Psychological attributes												
Shyness	.21***		.00		.14**		.13**		.13*		.12*	
Loneliness	.22***	.13	.26***	.07	.05	.02	−.00	.01	.12*	.04	.02	.01
Smartphone usage												
Information seeking	.15***		−.09		.11*		.18***		.07		.09	
Utility	.13**		−.00		.13**		.10*		−.02		.06	
Fun seeking	.17***		.19***		.15**		.11*		−.01		−.12*	
Sociability	−.05	.06	−.05	.03	.05	.04	−.09	.06	−.07	.00	.06	.02
R^2		.21		.19		.09		.10		.06		.06
Adjusted R^2		.20		.17		.07		.09		.04		.05

Note. $N = 414$. Figures are standardized β coefficients. R^2 is expressed in percentage of variance accounted for. [a]This is a composite measure of all 19 smartphone addiction symptom items; the higher the score, the higher the tendency of one to have the symptoms.
*$p \leq .05$; ** $p \leq .01$; ***$p \leq .001$.

(beta; = .13, $p \leq .01$), productivity loss ($\beta = .13$, $p \leq .05$), and feeling anxious and lost ($\beta = .12$, $p \leq .05$), while loneliness was significantly linked to the symptom of disregarding harmful consequences ($\beta = .26$, $p \leq .001$) and productivity loss ($\beta = .12$, $p \leq .05$). In addition to psychological variables, three of the four functions of smartphone use and SPAI were linked; the more they used smartphones for information seeking ($\beta = .15$, $p \leq .001$), utility ($\beta = .13$, $p \leq .01$), and fun seeking ($\beta = .17$, $p \leq .001$), the higher the likelihood that they would become addicted. With respect to addiction symptoms, regression analyses show that the more they used smartphones for information seeking, the higher the likelihood that they would exhibit addiction symptoms—such as preoccupation ($\beta = .11$, $p \leq .05$) and inability to control cravings ($\beta = .18$, $p \leq .001$). Moreover, results in Table 5 show that the more they used smartphone for utility, the higher the likelihood that they would exhibit addiction symptoms like preoccupation ($\beta = .13$, $p \leq 0.01$) and inability to control cravings ($\beta = .10$, $p \leq .05$). Furthermore, as shown in Table 5, the more Chinese students used smartphones for fun seeking, the higher the likelihood that they would exhibit addiction symptoms like disregard of harmful consequences ($\beta = .19$, $p \leq .001$), preoccupation ($\beta = .15$, $p \leq .01$), inability to control cravings ($\beta = .11$, $p \leq .05$), and the less they would exhibit feeling anxious and lost ($\beta = -.12$, $p \leq .05$). Demographically, being male seemed to indicate having more vulnerability to exhibiting the symptom of disregard of harmful consequences ($\beta = .21$, $p \leq .001$), while being female seemed to indicate having more vulnerability to exhibiting symptoms like preoccupation ($\beta = -.13$, $p \leq .01$) and inability to control cravings ($\beta = -.12$, $p \leq .05$). Results in Table 5 also indicate that the lower the grade students were in, the higher the likelihood that they would become addicted to smartphones ($\beta = -.13$, $p \leq .01$). The amount of variance explained ranged from 4% to 20%.

Predicting social capital. Finally, to compare the relative influence of shyness, loneliness, use of smartphone functions, and smartphone addiction symptoms on bonding and bridging social capital, a pair of hierarchical regression analyses was run. Results in Table 6 show that gender ($\beta = -.24$, $p \leq .001$) and grade ($\beta = .21$, $p \leq .001$) were two significant predictors of bonding social capital under the demographics block. It shows that females and students in the higher grades perceived higher levels of bonding social capital. The first block accounted for 10% of the variance.

Psychological variables were entered into the next equation. Results showed that loneliness ($\beta = -.33$, $p \leq .001$) was the only significant predictor of bonding social capital. Subjects who scored high on the level of loneliness would perceive that they had lower levels of bonding social capital. This variable contributed 10% of the variance.

The four functions of smartphone use were entered next in the equation. Using smartphones for information seeking ($\beta = .20$, $p \leq .001$) and sociability ($\beta = .15$, $p \leq .001$) contributed significantly to the regression equation, which explained a total of 6% of the variance. This reveals that the more one used smartphones for information seeking and sociability, the higher the level of bonding social capital they would perceive.

Five variables from the smartphone addiction symptoms block were entered last. Disregard of harmful consequences ($\beta = -.10$, $p \leq .05$), preoccupation ($\beta = .19$, $p \leq .001$), and feeling anxious and lost ($\beta = .14$, $p \leq .001$) were three significant predictors that accounted for another 6% of the variance. These results indicate that a greater amount of smartphone addiction symptoms of preoccupation and feeling anxious and lost predicted higher levels of perception of bonding social capital. However, the negative link between disregard of harmful consequences and bonding social capital reveals that a greater amount of smartphone addiction symptoms, as in disregard of harmful consequences, predicted lower levels of perceived bonding social capital.

The equation explained 32% of the variance in total. Demographic and psychological blocks were both the strongest predictors, but use of smartphone for information seeking and sociability or exhibiting addiction symptoms does have an impact on bonding social capital.

Table 6. Hierarchical Regression Analysis of Social Capital Using Demographics, Shyness, Loneliness, Smartphone Usage, and Addiction Symptoms as Predictors.

	Social Capital			
	Bonding		Bridging	
Predictors	β	ΔR^2	β	ΔR^2
Demographics				
Age	−.06		−.08	
Gender (male = 1)	−.24***		−.04	
Grade	.21***		.17***	
Family monthly income	.04	.10***	.05	.03***
Psychological attributes				
Shyness	−.05		−.12*	
Loneliness	−.33***	.10***	−.20***	.06*
Smartphone usage				
Information seeking	.20***		.18***	
Utility	.06		.14**	
Fun seeking	−.04		−.03	
Sociability	.15***	.06***	.07	.05**
Smartphone addiction symptoms				
Disregard of harmful consequences	−.10*		−.04	
Preoccupation	.19***		.20***	
Inability to control craving	−.06		−.04	
Productivity loss	−.03		−.06	
Feeling anxious and lost	.14***	.06*	.12*	.04*
R^2		.34		.21
Adjusted R^2		.32		.18

Note. N = 414. Figures are standardized β coefficients. R^2 is expressed in percentage of variance accounted for.
*$p \leq .05$; **$p \leq .01$; *** $p \leq .001$.

Likewise, results in Table 6 show that grade ($\beta = .17, p \leq .001$) was the only significant predictor of bridging social capital under the demographics block. It shows that the higher grade the students were in, the higher level of bridging social capital they would feel. The first block accounted for 3% of the variance.

After psychological variables were entered into the equation, loneliness ($\beta = -.20, p \leq .001$) and shyness ($\beta = -.12, p \leq .05$) were both significant predictors of bridging social capital. The negative link reveals that subjects who scored high on the level of loneliness and shyness would have lower levels of bridging social capital. This variable contributed 6% of the variance.

The four functions of smartphone use were the next entries in the equation. Using smartphones for information seeking ($\beta = .18, p \leq .001$) and utility ($\beta = .14, p \leq .01$) contributed significantly to the regression equation and explained 5% of the variance. This reveals that the more one used smartphones for information seeking and utility, the higher the level of bridging social capital they would have.

Five variables from the smartphone addiction symptoms block were entered last. Preoccupation ($\beta = .20, p \leq .001$) and feeling anxious and lost ($\beta = .12, p \leq .05$) were the only two significant predictors and they accounted for another 4% of the variance. This indicates that the greater the smartphone addiction symptoms of preoccupation and feeling anxious and lost students exhibited, the higher the level of bridging social capital they would report. The equation explained 18% of the variance in total.

Conclusions and Discussions

SPAS

One of the major aims of this research was to identify the underlying structure of smartphone addiction symptoms among Chinese students. Specifically, our data yielded five clearly identifiable symptoms: disregard of harmful consequences, preoccupation, inability to control craving, productivity loss, and feeling anxious and lost. The results of principal components factor analysis appeared to present construct validity of the SPAS and accounted for 70.09% of the variance. Moreover, not only was the 19-item SPAS able to provide a wealth of contextual information relating to smartphone addiction, but the data also yielded clear evidence for the multifactorial nature of smartphone addiction symptoms—five distinct factors representing a series of Chinese university students' behavioral consequences from smartphone addiction. As a whole, SPAS (both the index SPAI and five symptom subscales) correlated mostly in the hypothesized manner with measures of psychologically meaningful constructs such as shyness and loneliness and smartphone usage. These constructs contain a wide series of theoretically and practically important factors for influencing smartphone addiction in general.

Moreover, SPAS distinctly differentiated from the Mobile Phone Addiction Scale (Leung, 2008) for two different addiction symptoms—disregard of harmful consequences and preoccupation. This may be because that Leung's research was focused on adolescents, while this study was on university students. Since university students have more free time and less supervision by parents than adolescents, these may lead to development of those two different addiction symptoms. Moreover, past research found preoccupation and disregard of harmful consequences as Internet addiction symptoms (Leung, 2004; Tao et al., 2010). With additional functions and capabilities a 3G network provide (such as doing e-mail, surfing the Internet, using search engines, watching video, posting photos, and playing multiuser online games), smartphones let users connect to the Internet to engage in a wide range of activities anytime and anywhere. Thus, such advanced functions might have increased the chances of getting addicted and developing other smartphone addiction symptoms such as preoccupation and disregard of harmful consequences, beyond those levels noted for a standard mobile phone.

Effects of Psychological Attributes on Smartphone Addiction

In line with the hypotheses, SPAI and addiction symptom subscales were directly related to shyness and loneliness. This means the higher one scored in shyness and loneliness, the higher the likelihood one would be addicted to smartphones. These results are in line with past research that lonely people tend to use mobile phones more, and loneliness is positively related to mobile phone addiction among college students in Korea (Park, 2005). However, the results also run contrary to the results from Wei and Lo (2006) who found that shyness was negatively linked to motivation and amount of mobile phone use. This may be explained by noting that smartphones, unlike regular mobile phones, provide shy people a mobile device that gives them a perfect environment to alleviate loneliness and shyness. Lonely and shy people may engage in different activities, like playing online games, taking photos and videos, searching for news, texting a friend, and reading a book on a smartphone. Such finding is also supported by cues-filtering theory in computer-mediated communication studies. Interaction via smartphone reduces social cues, such as "nonverbal cues" (e.g., facial expression and gestures), as it involves less control of the disclosure and interpretation of social cues. Thus, lonely and shy people may get easily addicted.

With regard to specific addiction symptoms, this study found that shyness was the only predictor for inability to control craving, productivity loss, and feeling anxious and lost. This suggests that these symptoms may be more likely to be present in shy people. As for disregard of harmful

consequences, only loneliness had a significant effect. This may mean that lonely individuals overuse the smartphone to a point that they begin to show little concern for the harmful consequences on their schoolwork and being late to appointments and classes. Similarly, shy individuals are particularly apt to lose control of the time spent on smartphones, despite any negative effects their excessive use has already had on their productivity, and shy individuals also get increasingly anxious and feel lost if their smartphones are out of reception range or they have been unable to use the device for some time.

Although psychological factors played large roles in smartphone addiction, smartphone usage habits were also powerful predictors. Specifically, excessive use of smartphones for information seeking, utility, and fun seeking were predictive of symptoms such as preoccupation and inability to control cravings. This indicates that these often-used functions are most likely to be the causes for being preoccupied and the feeling of never spending enough time on the smartphone.

It is interesting to note that using smartphones for fun seeking was significantly but negatively related to feeling anxious and lost. This may be explained by noting that using smartphones for fun seeking may distract people and get them involved in the fun seeking functions like online games, which may help university students reduce anxiety or feeling lost. Likewise, using smartphones for fun seeking was also significantly and positively related to disregard of harmful consequences. This may be because with diverse entertainment applications and functions such as online games and social networking services accessible through the smartphone, it is inevitable to see university students get addicted despite any harmful outcomes.

Predicting Social Capital

The most powerful predictor affecting both bonding and bridging social capital was loneliness. As expected, subjects who scored high on loneliness did report lower levels of social capital. This makes sense and it is in line with past studies, which have indicated that lonely people tend to have a deficiency in ongoing relationships, have a lower level of involvement in social activities, self-disclose less, and spend less time with friends and more time alone (Sloan & Solano, 1984). Thus, they are likely to be relationally incompetent in maintaining or building social capital (Spitzberg & Canary, 1985). However, shyness only significantly and negatively predicted bridging social capital. This may be because shy people, who lack the confidence to meet people and who feel uncomfortable in the presence of others, regard their social network as less supportive and less satisfying (Pilkonis, 1977); thus, shy people are more happy and more comfortable being by themselves instead of taking active action to build new ties. Previous studies also confirmed that shy people struggle to maintain intimacy in close relationships (Weaver, 1987) and have poor social networks (Nelson et al., 2008).

Past research has demonstrated that ICTs have positive impacts on social capital building by facilitating online social connections and/or enhancing physical (off-line) interactions (Hampton & Wellman, 2003; Norris, 1996, 2003; Rheingold, 2002; Srivastrva, 2005; Wellman, 2001). This study yielded similar results regarding the impact of smartphone use on expanding social capital, especially when using smartphones for seeking information. Such a finding suggests that Chinese students often use smartphones for sending tweets and instant messages through social networking services (such as WhatsApp, WeChat, Weibo, or Twitter) to share information with others, bond with close ties like family and friends, and to bridge with weak ties or new acquaintances. Use of the smartphone for utility functions (e.g., doing e-mail and taking photos and videos) and use of smartphone for sociability (e.g., making phone calls and texting) were also significant predictors for bridging and bonding social capital, respectively. These findings may mean that university students prefer to use the smartphone to bond with close ties by making calls and texting their family and friends and to bridge with weaker ties by e-mailing them in formal correspondence to cultivate relationships.

It is worth noting that having symptoms such as preoccupation and feeling anxious and lost were significantly and positively related to both bonding and bridging social capital. One possible explanation is that when Chinese students exhibit symptoms (specifically using the smartphone to make themselves feel better when they are feeling down, feeling withdrawn when they are unable to use the smartphone, and fantasizing or thinking about using it when their smartphone is not available), such addictive behavior inadvertently boosts their smartphone use, resulting in better social capital. Similarly, when Chinese students exhibit symptoms (specifically feeling anxious and lost, and being preoccupied with the thought of missing a call when out of reception range for some time), they would also unintentionally increase their use of smartphone, resulting in strengthening their strong ties and weak ties.

By contrast, this study also found that the more harmful consequences the university students suffered from smartphone addiction (such as being late for appointments, classes, and meetings and lowered academic performance), the lower the level of bonding social capital they would report. This is logical as the less the harmful and negative consequences resulting from addictive use of smartphones, the more positive outcomes they will experience from proper use of the smartphone to foster social capital.

This study presents clear evidence that the use of smartphones for different purposes and the exhibition of different addiction symptoms significantly impacted social capital building. Of all the predictors—after controlling for demographics—psychological variables and smartphone usage accounted for most of the variance. The significant links between smartphone addiction and smartphone usage, loneliness, and shyness have clear implications for treatment and intervention for parents, educators, and policy makers. Intervention strategies should be focused on helping addicts with more physical activities, so that they can have better self-discipline in the use of their smartphones. Treatment also should assist lonely and shy addicts in improving their communication skills to make them feel comfortable when talking with others, which may lead to less addiction tendency.

Limitations and Suggestions for Future Research

First, it is important to note that since the addiction questionnaire contained some questions that may make respondents feel embarrassed, the overall results may have been affected. Second, due to the nonprobability sample, the skewed gender and grade distribution may not reflect the actual distribution at a typical university in mainland China. Such data, with over 81% being senior's or master's degree students in the sample, may lead to biased results in the severity of smartphone addiction and usage pattern as compared to junior students. Future research efforts should try to select samples randomly in order to eliminate these methodological limitations. Third, the reliability αs for the four smartphone usage pattern, deduced from the 16 smartphone activities, were low ranging from .64 to .79. Such reliability scores were marginal and the overall results may have been affected. Finally, younger individuals suffering from depression of anxiety disorders are more prone in developing addictions which is especially true for game, Internet, and mobile phone addictions (Kratzer & Hegerl, 2008; Robin-Marie Shepherd & Edelmann, 2005). Thus, depression of anxiety disorder could be a possible control variable in future studies. Despite these limitations, this study provides an exploratory framework for further research of addictive smartphone use. Future research should also compare results of different age groups and broaden the geographical background in relation to other behavioral and intoxicant addictions and other mental health problems.

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Notes

1. In Mainland China, the telecommunications companies provide various plans for making phone calls, text messages, and general packet radio service (GPRS). Both phone call and text message costs renminbi (RMB) 0.1 per min phone call or per text message within one province/city. Monthly GPRS plan starts from RMB 5/30/M to RMB 200/5G. If the monthly usage has exceeded 5G or what you have preselected, they will charge RMB 1/M afterward which may cause financial crises for Chinese students based on the normal monthly allowance of RMB 1,000 (about US$162).
2. Original items in Chinese are available upon request at author's e-mail address: bianmengwei@gmail.com

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Author Biographies

Mengwei Bian is a research executive at MillwardBrown ACSR—Shanghai. She graduated from the School of Journalism & Communication, the Chinese University of Hong Kong with a Master of Science degree in New Media; e-mail: bianmengwei@gmail.com.

Louis Leung is a professor at the School of Journalism & Communication, the Chinese University of Hong Kong. His research interests focus on the uses and social impact of new media technologies. Some of his recent publications have appeared in New Media & Society, CyberPsychology, Behavior & Social Networking, Computers in Human Behavior, Social Science Computer Review, Social Indicators Research, Telecommunications Policy, Journal of Broadcasting & Electronic Media, Journalism and Mass Communication Quarterly, Telematics and Informatics, Asian Journal of Communication, and Gazette; e-mail: louisleung@cuhk.edu.hk.

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Smartphone addiction and its relationship with social anxiety and loneliness

Asli Enez Darcin[a], Samet Kose[b], Cemal Onur Noyan[c], Serdar Nurmedov[d], Onat Yılmaz[e] and Nesrin Dilbaz[c]

[a]Kanuni Sultan Suleyman Research and Training Hospital, Istanbul, Turkey; [b]Department of Psychiatry and Behavioral Sciences, Center for Neurobehavioral Research on Addictions, University of Texas Medical School, Houston, TX, USA; [c]Department of Psychology, Uskudar University, Istanbul, Turkey; [d]Acibadem Health Care Group, Istanbul, Turkey; [e]Kasimpasha Military Hospital, Istanbul, Turkey

ABSTRACT

Individuals with psychosocial problems such as social phobia or feelings of loneliness might be vulnerable to excessive use of cyber-technological devices, such as smartphones. We aimed to determine the relationship of smartphone addiction with social phobia and loneliness in a sample of university students in Istanbul, Turkey. Three hundred and sixty-seven students who owned smartphones were given the Smartphone Addiction Scale (SAS), UCLA Loneliness Scale (UCLA-LS), and Brief Social Phobia Scale (BSPS). A significant difference was found in the mean SAS scores ($p < .001$) between users who declared that their main purpose for smartphone use was to access social networking sites. The BSPS scores showed positive correlations with all six subscales and with the total SAS scores. The total UCLA-LS scores were positively correlated with daily life disturbance, positive anticipation, cyber-oriented relationship, and total scores on the SAS. In regression analyses, total BSPS scores were significant predictors for SAS total scores ($\beta = 0.313$, $t = 5.992$, $p < .001$). In addition, BSPS scores were significant predictors for all six SAS subscales, whereas UCLA-LS scores were significant predictors for only cyber-oriented relationship subscale scores on the SAS ($\beta = 0.130$, $t = 2.416$, $p < .05$). The results of this study indicate that social phobia was associated with the risk for smartphone addiction in young people. Younger individuals who primarily use their smartphones to access social networking sites also have an excessive pattern of smartphone use.

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1. Introduction

Smartphones provide users with much more than a mobile phone. In addition to offering a camera and both offline and online games, smartphones offer thousands of applications available via the Internet. As the use of smartphones has become widespread, access to the Internet has also increased steadily. According to the Statistical Yearbook of the Netherlands 2014, mobile Internet use via smartphones reached almost 60% by 2013, which was an increase from approximately 20% in 2010 (Statistics Netherlands, The Hague/Heerlen 2014). In a survey conducted in 2014, 64% of American adults reported that they owned a smartphone, and 46% of the owners highlighted that their smartphone was something that 'they could not live without' (Pew Research Center 2015). A questionnaire-based study conducted in 2014 that included 25 Turkish cities and 1500 smartphone users (using 3G mobile Internet at least once per month) revealed that users benefited from the services at rates of 91% for social networking, 86% for instant messaging, 83% for Internet browsing, 71% for playing mobile games, and 67% for downloading novel applications. Additionally, although the mobile broadband penetration value for Turkey is 37.1%, most Turkish smartphone users are more active (in terms of using mobile services) than smartphone users in other countries (Ericsson Consumer Lab 2014).

Smartphones are user friendly and attractive for users, but they can be detrimental to the user's health if they are used in a problematic or an addictive manner. An epidemiological study revealed that people who use mobile phones excessively were more likely to experience health problems (e.g. headaches, fatigue, impaired concentration, insomnia, and hearing problems). It was also reported that some dimensions of personality such as low self-esteem, extraversion, higher approval motivation, and higher self-monitoring were more frequently seen in people who suffer from mobile phone addiction (Bianchi and Phillips 2005).

Behavioural addictions such as gambling disorder (included under Non-Substance-Related Disorders in The Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition) and Internet Gaming Disorder (included under Other Conditions That May Be a Focus of Clinical Attention) are defined as new disorders that significantly cause impairments. Most studies

CONTACT Asli Enez Darcin aslienez@gmail.com

addressing the excessive use and misuse of smartphones have been conducted in Eastern Asian countries (e.g. Korea, China, and Japan), where higher numbers of smartphone use are observed (Kamibeppu and Sugiura 2005; Wu et al. 2013; Kim et al. 2014; Mok et al. 2014).

A 2011 study determined that 8.4% of Korean people suffered from severe smartphone addiction (The Korean National Information Society Agency 2012). Other publications have defined smartphone addiction as uncontrollable and excessive use of a smartphone, the presence of withdrawal symptoms when control is attempted, and continuous use of a smartphone despite awareness of the consequences (Kamibeppu and Sugiura 2005; Wu et al. 2013; Kim et al. 2014; Mok et al. 2014).

As for other substance and non-substance addictions, it is impossible to state that smartphone addiction is a personal problem. Smartphone addiction is similar to Internet addiction in many aspects. Kim et al. (2006) reported that people with intense depression, loneliness, social anxiety, and impulsivity developed an Internet addiction more easily than did others. The consequences of Internet addiction include social isolation, family conflicts, academic failure, job loss, and financial debt (Young et al. 1999). Similar consequences might arise from smartphone addiction, which is also likely to lead to accidents, especially traffic accidents due to their handheld use or use as a navigation tool. Internet addiction is classified into specific subtypes (e.g. games, pornography, and chat rooms), whereas smartphone addiction can be classified as addiction to the use of social networks and various extensions.

Premorbid problems in social communication, such as social anxiety, phobia, and feelings of loneliness, can make individuals vulnerable to excessive use of cyber technology devices, including smartphones. Individuals with psychosocial problems such as social phobia and loneliness would prefer other methods of communication, particularly via mobile technological devices, rather than face-to-face communication because this type of communication can cause less anxiety. In this study, we aimed to determine the levels of smartphone use and addiction and the relationship between smartphone addiction and social anxiety and loneliness in a sample of university students in Istanbul, Turkey. Our study aims were to determine whether higher levels of social anxiety and feelings of loneliness would lead to higher levels of smartphone addiction.

2. Methods

2.1. Study participants

The study participants were students recruited from the Faculty of Health Sciences, Faculty of Engineering and Natural Sciences, and Faculty of Humanities and Social Sciences at Uskudar University in Istanbul, Turkey. The study procedures were conducted in accordance with the Declaration of Helsinki, and the study protocol was approved by the Institutional Review Board of Uskudar University. All the participants were informed about the study and provided written informed consent. Three hundred and seventy-five students who were smartphone users (out of 414 students) were included in the study. Eight participants with incomplete questionnaires or who refused to meet with one of the researchers were excluded. Data from 367 students were collected using data collecting tools, which took approximately 20 min. The Brief Social Phobia Scale (BSPS), which is a clinician rated scale, was administered by two psychiatrists independently (CON and AED) and took approximately 10 min for each participant.

2.2. Psychological measures

The participants were given a questionnaire (prepared by the researchers) that was designed to obtain socio-demographic information and specific information such as their primary reasons for using smartphones, their favourite place to frequently use their smartphones, their age when they obtained their first cell phone and first smartphone, whether they have social network accounts, and the use of smartphones in their family. Additionally, the participants were requested to complete the Smartphone Addiction Scale (SAS), UCLA Loneliness Scale (UCLA-LS), and BSPS.

2.2.1. Smartphone Addiction Scale (SAS)

The 33-item SAS was developed by Kwon et al. (2013). The SAS has a six-factor structure, and each item is scored on a six-point Likert-type scale. The total score can range from 33 (minimum) to 198 (maximum), with higher scores predicting a risk of smartphone addiction. The internal consistency value (Cronbach's alpha) of the scale is 0.96, and no cut-off scores were indicated in the original scale. The validity and reliability of the SAS for university students was examined in a study conducted in Turkey by Demirci et al. (2014), which confirmed that the scale was reliable and valid in determining the risk of smartphone addiction in young individuals. The internal consistency coefficient value (Cronbach's alpha) for the Turkish version of the scale was 0.947.

2.2.2. UCLA Loneliness Scale (UCLA-LS)

The scale, which was used to evaluate an individual's subjective feelings of loneliness, was developed by Russell, Peplau, and Cutrona (1980). It uses a 4-point

Likert-type scale and consists of 20 items, including 10 positive and 10 negative statements. The total score can range from 20 to 80, and the internal consistency (Cronbach's alpha) coefficient was 0.94. Higher scores refer to higher levels of loneliness. The scale was translated into Turkish by Demir (1989). Cronbach's alpha coefficient of the Turkish version was 0.91.

2.2.3. Brief Social Phobia Scale (BSPS)

The BSPS was developed by Davidson et al. (1991) and consists of 11 items that evaluate the severity of symptoms, treatment-induced changes over time, and both active and inactive treatment differences. The scale is composed of three subscales (fear scale, avoidance scale, and physiological symptoms scale), each with items scored from 0 to 4. Higher scores indicate more severe symptoms. The validity and reliability of this scale was confirmed in a Turkish university student sample by Dilbaz (forthcoming).

2.3. Statistical analysis

Data analysis was performed using SPSS for Windows, version 15 (SPSS Inc., Chicago, IL, USA). The data are presented as the mean ± SD for metric discrete variables; the number of cases and percentages were used for categorical variables. Pearson's correlation analysis of the UCLA-LS and BSPS was used in order to determine the degree of smartphone addiction. Moreover, to examine gender characteristics, an additional analysis was conducted in each gender group. The mean differences in SAS scores between groups and comparisons within groups were performed by an independent sample Student's t test. One-way analysis of variance (ANOVA) was used to determine whether there were significant differences between the means of two or more independent groups. The degrees of association between metric discrete variables were calculated by Pearson's product-moment correlation coefficients. Multiple regression analyses were conducted to examine the association between the severity of smartphone use and social phobia and loneliness. A p-value less than .05 was considered statistically significant.

3. Results

The average age of the 367 students that participated in the study was 19.5 ± 1.15 years. The majority of students were female (n = 226, 61.6%) and single (n = 343, 93.5%). There were no significant differences in the mean SAS scores in terms of gender and marital status (p = .258 and p = .188, respectively).

Data on the reasons for using smartphones and the existence of social networking accounts are presented in Table 1. With respect to the reasons for using smartphones, there were significant differences in the mean SAS scores (p < .001) when the group that uses their smartphones to access the Internet and for telephoning are compared to the group that uses their smartphones to access social networking sites.

There were no significant differences in the mean SAS scores (p = .135) between the group with accounts for social networking sites and the group without accounts for social networking sites. There were no significant differences in mean SAS scores (p = .184) with respect to the number of smartphone users in the family between groups. The participants' socio-demographic characteristics and the SAS scores are given in Table 1. The average age at which the participants first had a mobile phone was 13.1 ± 2.16 years, whereas the average age at which the participants had their first smartphone was 17.3 ± 2.02 years. When asked where they most often used their smartphones, the students most frequently answered in their bedrooms (57.5%), in classrooms (18.8%), and in meetings with family or friends (13.9%). Participants also confirmed that they use their smartphones while walking (77.7%), in classrooms, at meetings (59.7%), at the cinema or theatre (28.3%), and while driving a car (12%) (Table 2).

There was no significant correlation between the mean age and the mean SAS scores of the participants (p = .702) or between the mean duration of education and the mean SAS scores (p = .589). In addition, having a mobile phone or a smartphone at a younger age was

Table 1. Socio-demographical characteristics and SAS scores.

	n (%) Mean ± SD	SAS Mean ± SD	p-value
Age	19.5 ± 1.15		
Education (years)	13.6 ± 1.43		
Gender			.258
Female	226 (61.6)	89.7 ± 24.43	
Male	141 (38.4)	86.25 ± 27.69	
Marital status			.188
Single	343 (93.5)	87.86 ± 28.17	
Married	24 (6.5)	96.04 ± 28.17	
Reason to use a smartphone			<.001
Internet	146 (39.7)	85.71 ± 28.15*	
SNS	153 (41.6)	95.97 ± 26.45	
Games	9 (2.4)	75.5 ± 19.65	
Telephone	59 (16.0)	78.12 ± 29.23*	
SNS account			.135
No	19 (5.2)	75.81 ± 26.63	
Yes	348 (94.8)	88.63 ± 27.99	
Smartphone use in the family			.184
None	36 (9.8)	84.91 ± 26.63	
One family member	95 (25.8)	84.61 ± 23.31	
More than one	233 (63.4)	90.39 ± 30.0	

Note: SNS stands for social networking sites
*The difference in comparison to the group who use smartphones for social network accounts is statistically significant (p < .001).

Table 2. Descriptive analysis of the other socio-demographical characteristics.

	Mean (SD)	*n* (%)
Year of education	13.8 (1.08)	
Age of having the first mobile phone	13.3 (1.86)	
Age of having the first smartphone	17.5 (1.66)	
Number of owned smartphones	2.0 (1.2)	
Where use smartphone mostly		
In bed		211 (57.5)
In restroom		16 (4.4)
In meetings with family and friends		51 (13.9)
While driving		4 (1.1)
In classroom		69 (18.8)
More than one		16 (4.3)
Use smartphone while driving		44 (12.0)
Use smartphone in theatre and cinema		104 (28.3)
Use smartphone while walking		285 (77.7)
Use smartphone in classroom or meetings		219 (59.7)

not correlated with the SAS scores ($p = .138$ and $p = .324$, respectively). There was no significant correlation between the number of the smartphones owned and the mean SAS scores ($p = .269$).

All three subscales and the total score of the BSPS showed positive correlations with all six subscales and total scores of the SAS. The total UCLA-LS score was positively correlated with the total SAS score and three subscales scores, including daily life disturbance, positive anticipation, and cyber-oriented relationship (see Table 3).

In multiple regression analyses, total BSPS and UCLA-LS scores were entered as independent variables, whereas total SAS total scores and all six subscale scores were dependent variables in seven models. The total BSPS score was a significant predictor of the total SAS score ($\beta = 0.303$, $t = 5.992$, $p < .001$) and of all six SAS subscale scores ($p < .01$, only for the SAS overuse subscale; $p < .001$ for all other subscales). In the regression analysis, the total UCLA-LS score was a significant predictor for only the SAS cyber-oriented relationship subscale score ($\beta = 0.130$, $t = 2.416$, $p < .05$) (Table 4).

4. Discussion

The main findings of this study revealed that young people who use their smartphones primarily to access social networking sites had a significantly higher risk for smartphone addiction compared to their peers who use smartphones mainly for Internet surfing or making phone calls. There were significant positive correlations

Table 3. Correlational analysis of total and subscales scores of the SAS with BSPS and UCLA-LS scores.

		Subscales of SAS						
		Daily life disturbance	Positive anticipation	Withdrawal	Cyberspace oriented relationship	Overuse	Tolerance	SAS total score
BSPS – fear	*r*	0.274**	0.161**	0.235**	0.238**	0.122*	0.198**	0.263**
BSPS – avoidance	*r*	0.267**	0.172**	0.253**	0.199**	0.126*	0.189**	0.259**
BSPS – physiological	*r*	0.285**	0.198**	0.250**	0.243**	0.126*	0.191**	0.280**
BSPS – total	*r*	0.312**	0.198**	0.280**	0.255**	0.142**	0.220**	0.303**
UCLA-LS – total	*r*	0.142**	0.113*	0.076	0.179**	0.004	−0.008	0.122**

*$p < .05$
**$p < .01$.

Table 4. Stepwise linear regression analysis.

Model	Independent variables	*B*	*t*	*p*	*F*	df	R^2	Model *p*
1	BSPS total score	0.303	5.992	.000	35.902	1	0.092	<.001
	UCLA-LS score	0.040	0.756	.450				
2	BSPS total score	0.312	6.203	.000	38.477	1	0.098	<.001
	UCLA-LS score	0.036	0.670	.503				
3	BSPS total score	0.198	3.820	.000	14.594	1	0.039	<.001
	UCLA-LS score	0.975	1.360	.175			0.078	<.001
4	BSPS total score	0.280	5.506	.000	30.316			
	UCLA-LS score	0.004	0.082	.935				
5	BSPS total score	0.255	4.978	.000	24.779	1	0.065	<.001
	UCLA-LS score	0.130	2.416	.016			0.020	<.01
6	BSPS total score	0.142	2.709	.007	7.340	1		
	UCLA-LS score	−0.049	−0.873	.383			0.048	<.001
7	BSPS total score	0.220	4.258	.000	18.131	1		
	UCLA-LS score	−0.092	−1.69	.092				

Notes: Model 1: dependent variable SAS – total score;
Model 2: dependent variable SAS – daily life disturbance subscale score;
Model 3: dependent variable SAS – positive anticipation subscale score;
Model 4: dependent variable SAS – withdrawal subscale score;
Model 5: dependent variable SAS – cyber relationship subscale score;
Model 6: dependent variable SAS – overuse subscale score;
Model 7: dependent variable SAS – tolerance subscale score.

between the total SAS score and the SAS subscale scores as well as between the total BSPS score and the BSPS subscale scores. The UCLA-LS scores were significantly positively correlated with some of the subscale scores and the total SAS score. Multiple regression analyses were used to identify potential independent factors for the total SAS scores and subscale scores. In the regression analyses, the total BSPS score had significant predictive power for the total SAS score and all SAS subscales, and UCLA-LS scores had significant predictive power for the SAS cyber-oriented subscale scores. To the best of our knowledge, this study is the first to determine the relationship of smartphone addiction with loneliness and social phobia in university students.

Social networking is the practice of expanding the number of one's social contacts for social communication and business interactions. A preference for social networking is mainly associated with the need for socialising among young people. According to Salehan and Negahban (2013), the use of mobile social networking applications is a significant predictor of mobile phone addiction. One can probably assume that young people with the need to socialise might prefer to frequently access their social network accounts via smartphones, as was reported in this study.

As expected, in individuals with increased social anxiety symptoms, the risk of addiction to a smartphone increased because social anxiety causes the avoidance of real-time relationships. Furthermore, virtual socialisation can alleviate the fear or concern of demonstrating physical signs of physiological arousal symptoms, which are core symptoms of social anxiety. Communication via smartphone provides the opportunity to feel free and to behave without the perception of pressure in people with social anxiety. Pierce also reported that there is a positive relationship between 'feeling uncomfortable talking with others face-to-face' and 'talking with others online' and 'talking via text messaging' (2009).

In the present study, which included three hundred and sixty-seven university students, approximately 95% had an account on any social networking site, and 41% of them identified accessing their accounts as the main reason to use a smartphone. Although the reasons for excessive smartphone use may differ, both social anxiety and loneliness were found to be related to excessive smartphone use in this study. People with social anxiety may prefer texting, while people with feelings of loneliness prefer other activities with their smartphones rather than texting (Internet surfing, games, etc.), as was reported previously (Reid and Reid 2007; Takao, Takahashi, and Kitamura 2009). The feeling of loneliness was correlated with a high risk of smartphone addiction among the entire study sample. Thus, the feeling of loneliness might be associated with social anxiety, and the feeling of loneliness might be a consequence of using a mobile phone excessively instead of having face-to-face communications (Tan, Pamuk, and Donder 2013). In contrast, excessive smartphone use might be a self-treatment for people who experience the feeling of loneliness while they are trying to cope with bothersome feelings, as smartphones can provide them a different form of socialisation.

We found that the students who participated in the study had their first mobile phone or smartphone at young ages. More than half of the students that participated in the study used smartphones in bed at night time. We evaluated this pattern as a risky behaviour for sleep disorders with respect to sleep hygiene, although this study did not address a comprehensive assessment of sleep quality and patterns of the study participants. Seventy-five per cent of the participants stated that they use smartphones while walking, whereas 12% stated that they use smartphones while driving, which is a risky behaviour. More than half of the participants stated that they use smartphones during classes or meetings, whereas approximately one-third of the participants stated that they use smartphones during cultural activities (e.g. watching movies or theatre), thus indicating that this behaviour might have compromised their education and academic success.

This study has some limitations. First, the generalisation of the findings of this study to the general population is limited by the sample number and by the facts that all participants were students of a private university and that we did not analyse gender differences. Another limitation is the fact that the cross-sectional nature of the study would not allow us to link the causality between smartphone use and associated social anxiety/loneliness. Further prospective, longitudinal studies would help to establish a probabilistic causal relationship.

We conclude that although smartphones, the popularity and prevalence of which has increased in the last decade, typically make people's daily lives easier, the use of smartphones may become problematic in social life. Furthermore, smartphone addiction is a real risk, especially for the younger population struggling with social anxiety/phobia. Is it reasonable to define the continuous availability and accessibility of information on the Internet via smartphones as an addiction? Is the problematic and excessive use related to the phone itself or to the accessibility of the Internet or the availability of social networking sites via the phone? Alternatively, could all of the above statements be correct, and are they all related to smartphone use? Although these questions remain to be answered, it is possible to observe that many socially isolated individuals appear to remain

focused on their smartphones at home, in classrooms, inside vehicles, in parks, and in cafes. Because technology-enabled distraction is a modern-day life problem, development of the literature with further studies will facilitate the use of smartphones as a tool for making people's lives easier and allow for the examination of associated problems that can negatively influence their lives (physically, socially, and academically). We recommend that the social environment of young people should be watched carefully for symptoms of social phobia and feelings of loneliness to avoid the adverse consequences of smartphone addiction.

Disclosure statement

No potential conflict of interest was reported by the authors.

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Smartphone Addiction and Loneliness in Adolescent

Diana Savitri Hidayati
University of Muhammadiyah Malang
dianasavitri@umm.ac.id

Abstract. Adolescent nowadays spent most of their time online in the internet or used their smartphone. In consequence, they spent less of their time interact with their friends. It can cause a decreasing number of friends and made them experienced loneliness. Loneliness is a subjective unpleasant experience caused by the degradation of quality and quantity in social relation. Therefore this study aimed to see a correlation between smartphone addiction and loneliness in adolescent. Participants of this study are 356 freshman years students of University of Muhammadiyah Malang, aged 18-22. Data gathered using Smartphone Addiction Scale (SAS) and R-UCLA Loneliness Scale. Result showed, there is a positive correlation between smartphone addiction and loneliness in adolescent (r=0.227; p=0.000).

Keywords: Smartphone addiction, loneliness

Introduction

Loneliness is subjective unpleasant experienced caused by degradation in quality and quantity of their social relation (Peplau & Perlman, 1998). Giereveld and Tillburg defined loneliness as a loss of chance to create a social relation or even an intimate relation (Kristina, 2007). Furthermore, Cherry explained that when someone experienced a loneliness felt unwanted by another, experienced the emptiness, and feeling alone even surrounded by people or being in a crowd (Hidayati, 2015).

Loneliness experienced at any age range, based on research it mostly experienced by adolescent. Parlee's stated that 40.000 people experienced loneliness and 79% of them are adolescence (Sears, Fredman & Peplau, 2009). In 2010, Mental Health Foundation's survey in England showed that 24% of 2256 participants in their study aged 18-34 experienced a higher loneliness than participants aged 55 (Mental Health Foundation, 2010).

Many factors can cause loneliness, such as less of social relation. Less social relation can happen because people value another activity as a more important activity, such as browsed in the internet or spent time using gadget. Hu's research (2007) found that there's the impact of communication through the internet and social communication to loneliness. On the other side, direct communication could decrease the loneliness.

A different result showed in Kim's research (2009), internet over-used and online communication mostly done by the person who experienced loneliness, whom avoided the actual social relation because of the lack of ability to build a social relation. In conclusion, a person who experienced loneliness caused by the lack of ability in social relation and displaced the expression in to the internet.

Less interaction, no initiative to start conversations, and feeling more comfortable behind the smart phone, closer friends in social media, less empathic are caused by the lack of ability in social relation or lack of interpersonal ability. Decreased ability can cause by smart phone overused, Mok, et.al. (2014) research found that people who experienced smart phone could decrease interpersonal ability.

Human face to face interaction is decreasing, it caused by the smart phone invention, society spent most of their time searching and interact in social media through their smart phone (Afriyansgo, 2009; Nurmandia, et.al. 2013). Research in Korea showed that smart phone user found it hard to concentrate in decision making, experienced empty mind, and spent most of the time thought about their smart phone when it's not in their hands, they also felt closer with friends in smart phone than the real one. Most of the society feel more comfortable and more confidence being behind the smart phone than interact face to face with others (Jones, 2014; Kwon, et.al. 2013).

Research which involved 18 countries also found that 70 percent of the participant said that smart phone is more important in their daily life. Sixty percent feel obliged to check on their phone to update and feel anxious when they're not check the phone. Even 90 percent of the participant check their phone first before brushed their teeth, clothed and had a breakfast (Cisco, 2012).

Based on the research finding about the smart phone user's behavior, it is equal with pathological gambling and categorized in behavioral disorders. Smart phone user's behavior such as anxious, fear in run out of battery, checked the phone anytime, these over used behavior known as Nomo Phobia (no-mobile-phobia) and now it's mostly known smart phone addiction (Kalaskar, 2015; Kwon, et.al., 2013).

There are no age boundaries in smart phone, however the user in age range 18-29 are the most who experienced smart phone addiction in the population (Noviadhista, 2015). The Youth Columns, *JawaPos Radar Malang* newspaper (2015) ran a survey about Nomo Phobia. The participants are adolescent in Malang. Survey found that 67 percent of participant checked their phone every 5

minutes and only 5 percent of them checked their phone every one hour or above. Other research found that 60 percent of college student experienced smart phone addiction, they felt anxious and uncomfortable when they're not holding their phone (Biantoro, 2014). Those circumstances affect the frequency of interaction in social relation, and it could affect the time they practiced they're interpersonal ability.

Researches, facts, and situations led to the assumption that over used smart phone can cause the smartphone addiction. It could affect the user's behavior in lack of interpersonal competence in real life such as: initiative to interact, assertive, openness, emotional competence, and ability to solved conflict caused by the increasing in smartphone addiction. Smart phone invention used to make a communication easier, but recent research found the opposite, smart phone make people addicted, less direct interaction and it's all opposite of the main goal to make the communication easier. This condition could triggered decreasing numbers of friend and can experience loneliness because of decreasing quality and quantity in social relation.

Based on those explanations above, the purpose of this study is to measure the correlation between smart phone addiction and loneliness in adolescent. The result of this study expected to give information to adolescent as a smart phone user, and people around such as; peers, lecture, and parents about newest phenomena about smart phone addiction, with the information could decrease the effect of smart phone addiction caused by the smart phone over used. For psychological science development, the result of this study expected to help scholar in study and professional used as new information and references for the same research.

Loneliness

Loneliness was described by Gierveld and Tillburg as a formed in losing opportunity for making relationship with other people socially or in more intimate level (Kristiani, 2007). Lake (1986) stated that a loner was someone who needed other people to communicate and formed specialrelationship, which was intimate and affectionate relationship such in friendship. A similar statement was stated by Burger (Baron and Byrne, 2003) that loneliness happened whensomeone expected for close social relationship while they could not develop it. Those statements led to understanding that loneliness was an inconvenience feeling when someone did not have intimate or close relationship andan inconvenience feeling when they were realizing for not having the ability to develop any kind of intimate or close relationship.

Peplau and Perlman (1998) stated there were 3 substantial approaches for defining loneliness, i.e.:

a. *Need of intimacy*
   This approach emphasized about the need of having close relationship with other people. In this approach, Weiss (Peplau and Perlman, 1998) stated that loneliness did not cause by being alone, but it caused by the absence of the real need for being related or having a relationship. Loneliness always came as a response for the absence of a certain relationship type, or precisely, a response for the absence of some permanent relationships.
b. *Cognitive process*
   This approach emphasized in an individual perception and evaluation about their social relationship. Loneliness in this approach was a condition when there was a discrepancy or incompatibility between social relationship desired by someone and what they were actually achieving.
c. *Social reinforcement*
   This approach stated that loneliness caused by lack of reinforcement from social environment so that someone would feel lonely if they had less pleasure social interaction and it did not generate reinforcement. Gordon (in Peplau and Perlman, 1998) explained further that loneliness was feeling a loss that was coming when losing certain expected relationship with other people.

Sears, *et al*. (1994) proposed that loneliness referred to subjective discomfort when their social relationship lost its substantial characteristics. Those substantial characteristic could be quantitative or qualitative features. It was named quantitative because it was determined by number of friends around, for example someone did not have friend or only few friends, and the number of friend was less expected. While qualitative was determined by quality or individual satisfaction level about their relationship with other people, i.e. when someone felt that they had not deeply related with other people or less satisfied if it was compared to their expectation.

Smartphone Addiction

Smartphone addiction was compounded by two syllables, "addiction" and "smartphone". Addiction was defined as a functional abnormality in body limb caused by food or drug poisoned, or also caused by pathological condition and continuously consuming alcohol and drugs, and condition when was not able to assess or differentiate things rationally. Addiction had been used only in drug and substance abused, however the term of "addiction" now was used in gambling, internet, game, mobile phone used, or in any other behaviors cases. Smartphone was modern mobile phone that had highly compatibility level resembling function of computer. Smartphone usually had some modern features, e.g. email, media player, could be used as camera, navigation unit known as GPS, and it could be used for browsing using mobile data or Wi-Fi (Kwon et.al., 2013).

Bragazzi and Puente (2014) stated that smartphone addiction was uneasy feeling, anxiety, agitated, and miserable feeling caused by loss of connection with smartphone. While Park et.al. (2014) stated that smartphone addiction was like being poisoned, i.e. loss of power control, lack of tolerance, self-withdrawal indication, more obsessive, smartphone dependency, and having interpersonal problem.

The symptoms of addiction showed similar symptoms as in internet addiction, therefore smartphone addiction was developed from internet addiction. Young (1998) explained its aspects i.e., (1) always thinking to go online, (2) the urge of using internet for long time to get satisfaction, (3) less self-control to control, lessen, or quit in using internet, (4) always had gloomy and agitated feeling, (5) going online more than expected time, (6) daring to take risks losing relationship for going online, (7) willing to lie as escaping way from problem and mood disorder (e.g. helplessness, guilty feeling, and depression).

From result as stated by Young about aspects when someone had an addiction, then it was developed further by Kwon (2013) so that its aspects could be used as smartphone addiction aspects. Those smartphone addiction aspects were summarized through self-report in questionnaire that were consisted six aspects, i.e. : (1) disruption in daily life, (2) positive anticipation, as feeling good and happy from holding and using smartphone, (3) withdrawal, i.e. tendency self-withdrawal from social life, (4) orientation in cyberspace communication, (5) excessive smartphone used, and (6) lack of tolerance.

Based on description above, it could be concluded that smartphone addiction was state where someone feeling uneasy, anxiety, agitated, and lack of control in self when they were not holding smartphone. It were characterized by disruption in daily life, good feeling in holding and using smartphone, self-withdrawal from crowd, more likely to develop interpersonal relationship through cyberspace, excessive smartphone used, and lack of tolerance to environment.

The research hypothesis found that there were positive correlation between smartphone addiction and loneliness in adolescent. The more highly addiction to smartphone, the level of loneliness was also high.

Method

This research was conducted using quantitative correlational, to the correlation between smartphone addiction and loneliness. The research subjects were 356 adolescents who were University of Muhammadiyah Malang freshmen student or first year students with some characteristic, i. e.: men and women students, using smartphone for daily communication, with age ranged 18-22 years old, and students from every faculties and departments within University of Muhammadiyah Malang. The research sampling method was using *incidental sampling*, that was the sampling based on incidental whoever could be subject in this research if they were met the criteria of research subject characteristic (Sugiyono, 2014).

There were two variables studied in this research, those were smartphone addiction as independent variable and loneliness as dependent variable. Smartphone addiction was a great urge to constantly in repeating the activity for using smartphone, as feeling happy and good using smartphone so that disrupting any other activities. Data collecting method for smartphone addiction was revealed using Smartphone Addiction Scale (SAS) which was compiled by Kwon (2013). The instrument used Likert scale consisting 27 items. Based on validity test of measuring instrument, the instrument had validity index for 0,306-0,625 with reliability coefficient was 0,874 (Putra, 2016).

Loneliness was an individual emotional and cognitive reaction about bad condition by the decreasing in quality and quantity of social relation. The research instrument for loneliness was using Loneliness scale compiled by Russel (1996), i.e. the 3rd version of Revised University of California, Los Angeles Loneliness Scale (R-UCLA Loneliness Scale). The scale used Likert scale with total items of 20 items which consisted 11 negative items (loneliness) and 9 positive items (not loneliness). The instrument validity index was 0,320-0,658 with reliability coefficient 0,883 (Nurlayli&Hidayati, 2014).

The procedure of this research began from the preparation phase by organizing research proposal.The next phase was collecting data to research subjects who were adolescents aged 18-22 years old, which was a freshman in University of Muhammadiyah Malang, using smartphone addiction scale and loneliness scale that already confirmed its validity and reliability previously. The last phase was both performing data entry and data analyzing using SPSS 20 for windows program, by conducting Pearson Product Moment correlation test to find out linear association between two continuous variables.

Result

Based on Pearson Product Moment analysis, significance between smartphone addiction and loneliness is 0,000. It means that both of those variables have a significant correlation with $p<0.05$. Correlation coefficient shows the positive relations ($r = 0.151$), it means that the higher smartphone addiction, the higher loneliness that they felt, and vice versa. The contribution of smartphone addiction to loneliness is 5%.

Discussion

Result shows that there is a positive relation between smartphone addiction with loneliness in adolescent. The higher score in smartphone addiction, the higher their loneliness in adolescent and vice versa. The lower score in smartphone addiction, the lower their loneliness. Result explain that what caused the loneliness is decreasing quantity and quality in social interaction. This degradation happened because adolescent now have less direct social interaction, however they interact through smartphone. Loneliness felt by adolescent didn't come suddenly, but it happened because they prefer to allocate their time mostly to use smartphone rather than direct social interaction with another adolescent. People whom experience smartphone addiction will feel anxious, uncomfortable, and less self-control when they used smartphone. This could make someone ignore their environment, less empathy and less opened to other people, and it caused decreasing in interpersonal ability.

This condition caused the small number of friends and caused loneliness.

People who experienced smartphone addiction if showed a few criteria such as: happy when use smartphone, have a tendency withdraw from a social life, have an orientation to cyberspace, overused of smartphone, less tolerate to environment and disturbed daily activity (Kwon, 2013). Those explained that someone feel lonely because they intend to avoid social life. In this research, it showed that smartphone addiction contributed 5% as a caused of adolescent's loneliness.

This research supported by Bhardwaj & Ashok (2015), in their research it explained that there is a positive correlation between mobile phone addiction and loneliness experienced by students in Mumbai. However, that research held in Mumbai with 100 participants who live in Mumbai with the age range between 13-17 years old. Otherwise, in this research there is a bigger number of participants, there are 356 students involved in this research. The participants are the new students in University of Muhammadiyah Malang, with the age range 18-22 years old from a various major and faculty. it means, this research showed that positive correlation between smartphone addiction and loneliness in adolescent could apply to all students with the same background, culture and all adolescent in a late adolescent to early adult.

Jin and Park in their research explained that direct interaction could decreased someone's loneliness (Bhardwaj & Ashok, 2015). Someone that have a direct interaction, have a chance to communicate with other person could make them feel less lonely and the existence is validated. Those could fulfill their need to interact and have a relation with others, so they will not find happiness through their smartphone.

Darcin, Kose, et.al., (2016) in their research showed that adolescent who used their phone for a social media are more susceptible to smartphone addiction than adolescent who used their phone for calling and internet browsing. Smartphone addiction experienced by adolescents also related with social anxiety and loneliness. Overused smartphone, accessing social media replaced the activity that adolescent should do such as direct interaction or telling stories with somebody else's (Darcin, Kose, et.al., 2016)

Other research by Toda & Ezoe (2013) explained that loneliness and mobile phone addiction have a positive correlation with internet used in medical students in Japan. However, the biggest contribution to internet addiction is a loneliness in adolescent. Adolescent who experienced loneliness have tendency to do an activity by themselves, using the internet and avoiding the environment, they will eventually experience the addiction. The research almost the same as the research that had been held, adolescents with smartphone addiction could cause loneliness, because they were isolated from real world and didn't have a direct interaction with others.

Bian & Leung (2015) argue that the function of smartphone could make people addicted, because in smartphone there are application to read like e-book, email, messaging through SMS, social media, online game, and other features. These activities using smartphone could make people spent their time mostly on smartphone until they got addicted. People who experienced addiction not only harm themselves, but also could harm other people, for example it could disturb other's comfort in public places.

Based on research conducted in 414 students in Tiongkok, it explained that psychological effect from smartphone addiction is loneliness (Bian & Leung, 2015). It has a same result as this research, which showed that there is a positive correlation between smartphone addiction and loneliness in adolescent. Someone with loneliness show less involvement in social activity, less open, spent less time with others, and spent time mostly alone.

Basically, smartphone used is really helpful because smartphone could make it easier in fulfill the need. Smartphone not only used for a social media, but also to search information through internet, as a media for some people that has difficulties in direct communication with others, and also to entertain ourselves using a game application in smartphone. So that, smartphone should be used like how it supposed to, not overused, so there is no addiction in adolescent. Hong, et.al., (Al-Barashadi, Bouaza & Jabur, 2014) stated in their research, students could increase their communication and social relation with other through smartphone use. It means, not excessive used of smartphone could give a good impact in adolescent.

Conclusion

Based on this research, it can conclude that the hypothesis is accepted. There is a positive correlation between smartphone addiction and loneliness in adolescent. It based on statistical analysis with significance (p) 0.000 and R value= 0.151. Smartphone addiction contribute 5% to a caused of loneliness, so, there are 95% other things that has a contribution in loneliness.

Implication in this study, specifically for participants of this study is that they have to try to decrease the tendency to smartphone addiction because it could cause loneliness. They can control and limited themselves in using smartphone and spent more time to a more meaningful activity like reading and sports. Implications for other researcher that have an interest with this variable, can used an instrument in this research to other population.

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Jurnal 5

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Relationship between Smartphone Addiction and Loneliness among Adolescents*

Ergenlerde Akıllı Telefon Bağımlılığı ve Yalnızlık Arasındaki İlişki

Gül Dikeç[1], Tuğçe Yalnız[2], Berna Bektaş[3], Atakan Turhan[3], Sümeyye Çevik[4]

1. Istinye University, Faculty of Healh Sciences, Department of Nursing.
2. Ege University, Faculty of Nursing, Department of Psychiatric and Mental Health Nursing, Izmir, Turkey.
3. Su Hospital, Izmir / Turkey.
4. Emot Hospital, Izmir / Turkey.

ABSTRACT

Objective: The aim of this study was to examine the relationship between smartphone addiction and loneliness in a group of high school students in İzmir.

Method: The data were collected from 465 students using a Personal Information Form, the Smartphone Addiction Scale-Short Form (SAS-SF) and the UCLA Loneliness Scale.

Results: The average age of the participant students was 16.15 ± 1.04, with males constituting 42.8% and females constituting 57.2% of the study sample. The students' average scores on the SAS-SF and UCLA were 28.14 ± 11.54 and 53.72 ± 5.42, respectively. A significant positive relation was found between SAS-SF and UCLA (r: .202, p: 0.00), and while no significant correlation was observed between SAS-SF, age, and GPA (p > 0.05). A positive moderate correlation was found in terms of the daily duration of smartphone usage (r: .409, p: 0.00).

Conclusion: The study found that students who feel a sense of loneliness tend to use smartphones a lot and are at risk of smartphone addiction. It is recommended that addiction community mental health nurses take preventive measures against smartphone addiction to protect and improve the mental health of the students.

Keywords: community mental health nurse, high school students, loneliness, smartphone addiction.

ÖZET

Amaç: Bu çalışmanın amacı İzmir ilindeki bir grup lise öğrencilerinde akıllı telefon bağımlılığının yalnızlık düzeyi ile arasındaki ilişkiyi belirlemektir.

Yöntem: Araştırmanın verileri literatür taranarak hazırlanan Bilgi Formu, Akıllı Telefon Bağımlılığı Ölçeği Kısa Formu (ATBÖ-KF) ve UCLA Yalnızlık Ölçeği ile toplandı. Çalışmaya toplam 465 öğrenci katıldı.

Bulgular: Çalışmaya katılan öğrencilerin yaş ortalaması 16.15±1.04, %42.8'i erkek ve %57.2'si kadındır. ATBÖ-KF puan ortalaması 28.14±11.54 ve UCLA Yalnızlık Ölçeği puan ortalaması 53.74±5.43'tür. ATBÖ-KF puan ortalamaları UCLA Yalnızlık Ölçeği arasında anlamlı pozitif ilişki saptandı (r: .202, p:0.00). Öğrencilerin ATBÖ-KF puan ortalamaları ile genel not ortalamaları ve yaş arasında anlamlı ilişki saptanmazken (p<0.05), ATBÖ-KF puan ortalamaları ile telefon kullanım süresi arasında pozitif orta düzeyde ilişki saptandı (r:.409, p:0.00).

Sonuç: Ergenlik dönemindeki öğrencilerin yalnızlık duyguları hissederek akıllı telefonları ile daha fazla vakit geçirdikleri ve bağımlılık için risk oluşturduğu söylenebilir. Toplum ruh sağlığı hemşirelerinin davranışsal bağımlılıklardan korunma ve yalnızlık ile baş etme konularında ruh sağlığını geliştirme programlarından yararlanmaları önerilebilir.

Anahtar kelimeler: akıllı telefon bağımlılığı, yalnızlık, lise öğrencisi, toplum ruh sağlığı hemşiresi.

Correspondence / Yazışma Adresi: Gül Dikeç, Istinye University, Faculty of Healh Sciences, Department of Nursing. Istanbul /Turkey
E-mail: guloban@hotmail.com
*This research has been presented as an oral presentation in IV. International & VIII. National Psychiatric Nursing Congress on November 6-9, 2016 in Manisa-Turkey

INTRODUCTION

In addition to the traditional features of a telephone, a smartphone is able to fulfill many of the functions of a personal computer (1,2). More specifically, these devices offer users the ability to send e-mails and text messages, watch videos, listen to music, play games, check the news or weather, shop online, make voice or video calls, and follow a variety of social media forums. Along with many applications, they are also portable and can be connected to the Internet from almost anywhere. Therefore, it is not surprising that these devices have become an important part of many people's lives in terms of the amount of time people are engaged with them. Young people especially tend to use smartphones often, to such an extent that many people believe that this usage amounts to addiction (2,3).

Today, it is common for individuals to be inseparable from their smartphones, as demonstrated by the latest data published from the Pew Research Center in the USA, which reports that 46% of smartphone users say "I can't do anything without smartphones" (4). Use of smartphones often affects individuals' daily routines, work, and school lives, as well as social and family relations. Furthermore, frequently checking the smartphones can potentially result in mental and physical problems, such as sleep disorders, anxiety, withdrawal, and low success rates in academic endeavors, in addition to reduction of physical activities and the development of spinal cord deformities (2,5). Some observers have concluded that smartphone usage has developed into a situation that is gradually affecting the public's mental health and creating addiction problems (6) Similar to internet addiction, smartphone addiction too features certain symptoms, such as repetitive engagement in actions that give pleasure, loss of control, negative impacts on daily activities, tolerance (e.g. increased amounts of usage time, more apps) cravings, and withdrawal when actions are unfulfilled (3, 7, 8) to a study conducted on 10,191 adolescents in Taiwan, 30% of the participants developed high levels of tolerance, 36% experienced withdrawal symptoms, 27% had long usage periods, 18% failed to give up using smartphones, and 10% experienced intimacy problems (9).

Loneliness is defined as a mood resulting from identity crises experienced during adolescence. Loneliness is experienced during this period, but not as a disorder. To relieve this loneliness, adolescents actively access social media using smartphones which have become one of the irreplaceable elements in our lives (10). They particularly tend to prefer communicating via mobile technological devices to face-to-face conversations (11). They find it comforting to communicate via smartphones, as it prevents them from having to make eye contact or to deal with the ambiguities of body language (12). As has been illustrated in a study undertaken in Turkey, social anxiety, low self-respect, and shyness are among the precursors to loneliness among high school students (13). Failure to attain success via face-to-face communication is compensated through engaging in social networking and cyber relations. The fast, untroubled communication provided by the internet and social media serves to decrease loneliness (14). Using smartphones compulsively at school, on a bus, in the market and at other places helps adolescents feel less lonely (15). Park (2005) found a positive correlation between smartphone usage and loneliness among college students (16). Additionally, in a study conducted by Bian and Leung (2015) in China examining the relation between smart phone usage among undergraduates and the levels of loneliness and shyness, the authors observed that certain levels of loneliness and shyness acted as a precursor to smartphone addiction (14).

The studies in Turkey on smartphone addiction have been conducted by medical faculties or undergraduates (7,8,17). While a number of studies have already been conducted on internet and mobile phone addictions, only a limited number of studies dealt specifically with smartphone addiction and loneliness among adolescents. The aim of this study is to examine the relationship between smartphone addiction and loneliness in a group of adolescents in Izmir.

MATERIALS AND METHODS

This study employed a descriptive, cross-sectional design and used self-report questionnaires to examine the relationship between smartphone addiction and loneliness in a group of adolescents in Izmir. For this study, the following questions were formulated:

1. Is there any correlation between smartphone addiction and loneliness in adolescents?
2. Is there any relationship between certain gender of the adolescents and smartphone addiction?

Participants

The data were collected from four high schools in Izmir between March 25 and April 15, 2016. The population of the study consisted of students at general high schools in Izmir in the 2015-2016 spring term, and the study sample consisted of four general high schools randomly selected by lot from 4 districts (one high school from each district) within the city center of Izmir. A total of 666 students were identified for participation in the study, but only 465 of them were qualified to participate, as they were present at the time of the study, had parental consent, and owned a smartphone.

The inclusion criteria were being between the ages of 13 and 19, agreeing to participate the study, being registered in the schools where the study was conducted, being present in the classrooms when the data were collected, and using smartphones.

Measurements

Information form: A 19-question information form was developed by the researchers based on the literature (3,7) in order to collect data about the participants' socio-demographic characteristics and smartphone use.

Smartphone Addiction Scale – Short Form (SAS-SF): The SAS-SF is a self-report scale developed by Kwon et al. (2013) to evaluate the risk of smartphone addiction among adolescents (3). It is a 6-point Likert scale consisting of 10 items, to which the responses range from "I strongly disagree" (1) to "I strongly agree" (6). Total scores can range from 10 to 60, with higher scores indicating higher levels of smartphone addiction risk. Noyan et al. (2015) tested the scale for Turkish validity and reliability (8). In the one-factor Korean sample of the scale, the cutoff score was determined to be 31 for men and 33 for women (3). The cutoff scores were not determined in the Turkish validity and reliability study of the scale as there were no clinical interviews conducted with participants concerning smart phone addiction. The cutoff scores obtained in the Korean sample were not considered suitable for the Turkish society for reasons such as different technology usage habits and cultural differences. Moreover, the Korean version of the scale has no subscales and therefore, the score is evaluated in total points (3). The Cronbach's alpha internal consistency coefficient was 0.91 for the original version and 0.86 for the Turkish scale (8). In this study, Cronbach's alpha coefficient was found to be 0.89.

UCLA Loneliness Scale (UCLA-LS): The UCLA Loneliness Scale is a 4-point Likert type self-report scale that serves to determine an individual's level of general loneliness. The original form of the scale has a total of 20 items; 10 positive, indicating the individual does not feel lonely, and 10 negative, indicating the individual feels lonely. Responses to these items range from "I never feel this way" (1) to "I often feel this way" (4) (18). The highest possible score is 80, while the lowest possible score is 20. High scores indicate that an individual feels lonely more often than an average person. The Turkish validity and reliability study of the scale was conducted by Demir (1989), who found the Cronbach's alpha reliability coefficient of the Turkish scale to be 0.94 (19). In this study, Cronbach's Alpha coefficient was found to be 0.41.

Ethical Considerations

Ethical approval for the study was granted by the University Medical Faculty's Ethics Committee of Medical Researches in Izmir on November 2, 2015, with protocol number 2016/22, and institutional approval was granted by Izmir Ministry of National Education, with the governorship approval number 12018877-604.01.02-E.3101387. After obtaining approval from the Ethics Committee and the government, information about the study was hand delivered to the school principal and counselors of each high school. On the first day of the data collection of the study, after being given verbal permission from the

teacher, the researchers informed the students about the study by reading out the research instructions in the classrooms during counseling courses. Informed consent forms were then handed out to the students by the researchers, who asked them to receive consent from their parents if they wished to voluntarily participate in this study. Each participant and the caretakers or guardians of the adolescent participants provided a written informed consent after first receiving a full explanation of the study's purpose and procedure. On the second day, the students who had returned the signed consent forms were asked to fill out the study forms, and the researchers collected the forms once they were completed.

Data Analysis

For analysis of the descriptive data, the SPSS- 22.0 (Statistical Package for the Social Sciences) was used. It was used to determine the average, minimum, maximum, standard deviation, and percentage distributions, and for the comparative analysis, the Student's t-test, Pearson correlation, regression analysis, and one-way analysis of variance (ANOVA) among the parametric methods were used. The results were assessed at a 95% confidence interval and $p < 0.05$ significance level.

RESULTS

The average age of the students who took part in the study was 16.15 ± 1.04, and the mean of their latest school grade point averages (GPA) was 83.69 ± 9.1. The personal and socio-demographic information of the students is shown in Table-1. Regarding the individual characteristics of the students, 42.8% of them were male and 57.2% were female, 31.4% were tenth graders, 57% perceived their economic situation as good, and 93.1% resided in a home. When students were asked whether there was internet connection at their place of residence, 90.8% responded 'yes', while 9.2% responded 'no' (Table-1).

Table-1. Comparison SAS-SF, UCLA-LS Average Score and Some Characteristics of Participants

Characteristics	N	%
Gender		
Female	266	57.2
Male	199	42.8
Class		
Nine	134	28.8
Ten	146	31.4
Eleven	106	22.8
Twelve	79	17
Economic Situation		
Poor	8	1.7
Moderate	161	34.6
Good	265	57.7
Very Good	31	6.7
Residence area		
House	433	93.1
Dorm	32	6.9
Internet Access		
Yes	422	90.8
No	43	9.2

The student participants' daily average amount of time of smartphone use was 4.04 ± 3.15 hours (Table-2). In terms of the activities for which the students used the smartphone, 78.3% used it for listening to music, 77.2% for texting, 70.9% for following social media, 57.5% for watching videos/films, 57.3% for chatting, 31.3% for following scientific information, 22.5% for note taking, 11.4% for shopping, and 10.6% for sending e-mails.

The average score obtained by the students was 28.14 ± 11.54 on the SAS-SF, while it was 53.72 ± 6.42 on the UCLA Loneliness Scale. A positive correlation was found by the Pearson Correlation between the SAS-SF and the UCLA Loneliness Scale (r: .202, p: 0.00). While no significant correlation could be determined between the SAS-SF, age, and GPA (p >

0.05), a positive moderate correlation was found for the daily duration of smartphone usage (r: .409, p: 0.00) (Table-2).

Table-2. Students' average scores of SAS-SF and UCLA-LS and the correlation between SAS-SF and some variables

Scales	Min	Max	Ort	SD	R	p
SAS-SF	10	62	28.14	11.54	.202.202	
UCLA-LS	20	80	53.72	5.42	.202	0.00
Age	14	19	16.15	1.04	.11	0.81
GPA	53.00	100	83.69	9.10	-.028	0.553
Daily average duration of smartphone usage	1	24	4.04	3.15	.409	0.00

In the regression analysis performed, a statistically significant relationship was determined between age, GPA, duration of daily smartphone usage, and the scores obtained on the SAS-SF (F = 28.189; p = 0.000 < 0.05). The variables of age, GPA, and duration of daily smartphone usage were found to be poor determinants of addiction to smartphone (R^2 = 0.197). In other words, the ages of the phone users (p = 0.857 > 0.05) and their GPA (p = 0,815 > 0.05) were shown to have no impact on their addiction to smartphones. An increase in the addiction to smartphones (ß = 1.468, p = 0.000) was found to be impacted by the relationship between the average scores obtained by the students on the UCLA Loneliness Scale (ß = .176, p = 0.000) and the duration of daily smartphone usage.

According to the Student's t-test, which was applied to independent groups, a significant difference existed between the genders in terms of the average scores obtained by the students on the SAS-SF (p = 0.000< 0.05) and on the UCLA Loneliness Scale (p = 0.029 < 0.05).

Table-3. The effect of independent variables on SAS-SF

Dependent Variable	Independent Variable	ß	t	p	F	Model (p)	R2
SAS-SF	Stable	-.851	-.088	0.93	28.189	0.000	0.197
	UCLA-LS	.176	4.180	0.000			
	Age	.008	0.181	0.857			
	GPA	.010	0.238	0.815			
	Daily Duration of Smartphone Usage	.401	9.503	0.000			

DISCUSSION

The aim of this study was to determine the relationship between smartphone addiction and loneliness in a group of adolescents in Izmir. The present study was planned in response to the very limited number of studies in Turkey that have focused on the smart phone addiction of high school students. Because in recent years, the use of smartphones has become an indispensable part of life, especially among high school and university students, to such an extent that for some individuals it can develop into an obsessive-compulsive thought disorder and can negatively impact the physical and mental health of the affected individuals (8). Im et al. (2013) examined the relation between psychiatric symptoms and smartphone usage among the college students in their study, and found that in the group whose risk of smartphone addiction was higher, more psychiatric symptoms were observed (20). Choi et al. (2012) indicated that the use of smartphones affected the students' campus life, interpersonal communication, and mental health (21).

In the current study, the average scores obtained by the high school students on the SAS-SF was low, just as it was for the adolescents in Taiwan (3). The activities for which the students generally used the smartphone included texting, listening to music, following social media, watching videos/films, and chatting. In particular, various forms of social media are

used as tools that enable individuals to engage in communication, obtaining information, sharing their individual status, uploading videos or pictures, chatting in small or large groups, and following social media, all of which are popular among adolescents. In addition, quick texting with the applications that can be downloaded on phones is also quite common among young people. According to the Turkish Statistical Institute's (TUIK) "Household Use of Information and Communication Technology Research" (2015), 74% of the entire Internet connection is made through a smartphone (22). Furthermore, the report specified that it is most frequently used by the age group of 16 and 24, and that social media constituted 78.8% of smartphone usage in 2014. In a study conducted in China among young people, it was determined that there was an increasing tendency to smartphone addiction, as the duration of time on social media sites increased (23). In their study on high school students, Doğan and Tosun (2016) discovered that a significant correlation existed between the time spent on social web sites and problematic usage of smartphones (24). The study findings are similar to those found in the literature.

The students obtained a high average score on the UCLA Loneliness Scale, and there was a positive correlation between the SAS-SF and the UCLA Loneliness Scale. In a study by Şar (2013), a positive relation was determined between adolescents' problematic phone usage and feelings of loneliness (25). Enez Darcin et al. (2016) demonstrated in their study that there was a correlation between loneliness and smartphone addiction among university students, and that students who primarily used their smartphones to access social networking sites also had an excessive pattern of smartphone use (11). Moreover, in Doğan and Karakuş's (2015) study, it was observed that the loneliness of high school students led to an increase in the time they spent on social media web sites (15). Since it is generally accepted that the feeling of loneliness is more intense during adolescence, it seems reasonable to conclude that the use of smartphones increased as a result of adolescents trying to manage feelings of loneliness. On the other hand, especially adolescences who feel lonely may more frequently use the social web sites and can engage in communication using fake identities (15) that make them feel more relaxed and more courageous in the virtual environment (26). Creating problematic relations in unreliable environments may also let them do cyber bully behaviors. In Peker &Eroğlu's study (2015), it was detected that the tendency of cyber bullying increases if the perceived social support of adolescences decreases (27).

Smartphones, which were used to make phone calls and send texts, have started to do what computers can do and thus gained an important place in our lives. Smartphones meet the needs such as navigation, access to information and communication, and are more frequently used by children and adolescents. Adolescents excessively use smartphones to play games, call their friends and access to internet, which indicates that smartphone addiction may be common in this population like internet addiction. Access to the internet and excessive use of smartphones may prevent adolescents from reducing the frequency of use and cause deprivation, poor performance in school, as well as domestic and social issues. Studies indicate that excessive use of smartphones negatively affects mental and physical health. Hwang et al. (2012) reported that a group that excessively used smartphones had high anxiety and depression scores (28). Demirci et al. (2015) suggested that those who used their smartphones more frequently had higher depression and anxiety scores (17). Smartphones may cause anxiety and depression, and excessive use of them may distort the biological clock, cause sleep disorders, and cognitive, emotional and mental symptoms. In addition, adolescents frequently wake up due to the notifications they receive, and failure to sleep at night reduces the synthesis of melatonin (29). Anxiety and depression also worsen the addiction to smartphones (30). Kim et al. (2015) found that there was a correlation between smartphone addiction and depression, aggression and impulsions (30).

No significant relation was found between the students' GPAs and the average scores of the students on the smartphone addiction scale. However, studies in the literature show that increased use of smartphone has a negative impact on students' academic performances (2). Constantly checking the smartphones, sending of text messages, or following of social media

while studying or listening to lessons may distract students or affect their participation in the lessons. In a study by Karpinski et al. (2013) on college students, a negative relationship was identified between students' social media use and GPA (31).

Similar to the results in the literature, a positive moderate relationship was found between the daily average duration of smartphone use and smartphone addiction. This is an expected result given that the frequent repetition of an activity that gives pleasure increases the risk of addiction. Demirci et al. (2014) demonstrated in their study that the risk of smartphone addiction increased as the daily duration of smartphone use increased (7). Noyan et al. (2015) identified a significant relation between daily average duration of smartphone use and the scores obtained on SAS-SF (8). Wu et al. (2013) indicated that there was a relationship between the risk of smartphone addiction and the daily duration of time the participants spent with their devices (23).

In this study, a significant difference was determined between the scores obtained on the SAS-SF scale in terms of gender; specifically, the average scores of the female students on the SAS-SF were higher. In the literature, different studies show similar results. Kwon et al. (2013) observed that there was a difference between genders in terms of average scores on the short form of the smartphone addiction scale; female students obtained higher scores (3). Likewise, Demirci et al. (2014) found that the average scores obtained by female students on the smartphone addiction scale were significantly higher than those of male students (7). It is important to point out that although substance and internet addiction are predominantly seen among males, smartphone addiction is more commonly observed in females (32).

Since the data of this study were collected from a group of high school students, the results cannot be used to make generalizations about other age groups. Community mental health nurses should have access to studies with a larger sample in order to obtain information about the rate of smartphone addiction, the risk factors, and the development of protocols, particularly those which are based on prevention studies.

The literature shows that individuals with smartphone addiction suffer musculoskeletal system disorders, such as improper cervical posture and ligament injuries; and improper cervical posture may cause degeneration of lumbar vertebrae. In addition, excessive use of smartphones may cause sleeping problems and headaches. In this study, there were no scales or questions on the forms addressing the adolescents' physical health complaints that may be related to the use of smartphone. Other limitations of the study include the lack of a clinical interview with participants concerning smartphone addiction, collection of the data using only the self-report scale, and the failure to calculate the reliability coefficient of the UCLA Loneliness Scale, although it was infrequently used in this research.

The high school students who participated in the study obtained low the average scores on the SAS-SF, and a positive correlation was found between the SAS-SF scale scores and the UCLA Loneliness Scale scores. Individuals who feel lonely tend to engage in a greater use of technology and smartphones.

The role of a community mental health nurse is critical in identifying and protecting against behavioral addiction. Therefore, nurses should be aware of the rate of smartphone addiction and the factors involved in the development of the addiction. They must also have the capacity to administer preventive strategies against smartphone addiction to protect and improve the mental health of the high students at the school. It is important that new care plans include the possibility of smartphone addiction. Creating secure network for adolescences should to be provided and nurses should be in contact with the families. Families should particularly be informed about providing smartphone and internet use in scheduled hours for their adolescences, and providing secure internet networks which help them avoid possible cyber tyranny on the internet.

Based on these findings, nurses should also be aware of the mental needs of adolescents as well as their changing physical needs, and be able to deal with them from this point of view. Additionally, adolescents should undergo periodic checkups to determine whether they manifest any signs of addiction, and nurses should cooperate with families and teachers. At-risk adolescents should be identified and offered relevant prevention programs. Finally, social skill programs aimed at decreasing or managing the problems of loneliness should be developed with the aim of securing the students' health.

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Lampiran 6

RIWAYAT HIDUP

Nama	: SUSANTI PITRI HANDAYANI
NIM	: AK.1.16.151
Tempat/Tanggal Lahir	: Majalengka, 31 Agustus 1997
Alamat	: Jl.Dukuh Pabrik Blok Minggu RT06 RW01 Desa Lojikobong Kecamatan Sumberjaya Kabupaten Majalengka - 45455

Pendidikan

1. SDN Lojikobong II : 2003-2009 Tahun
2. SMPN 3 Sumberjaya : 2009-2012 Tahun
3. SMAN 1 Panyangkiran : 2012-2015 Tahun

Universitas Bhakti kencana Bandung : 2016-2020 Tahun